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CONTENTS

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TPr. Diyanah Inani Azmi (839/22)
TPr. Young Elias Young Daud (815/21)

CONCERN OVER PROPERTY VALUE: WILL THE SITTING OF PETROCHEMICAL HUB INFLUENCING HOUSING PRICE?

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Abstract

Malaysia is a major exporter for petrochemical products. In line with this, the petrochemical industry is experiencing continuous growth and expansion. This study intends to examine the effect of the establishment of petrochemical hub on nearby housing price. Using residential transaction data of year 2016-2022 nearby Gebeng Industrial Area, we analyse the effect of the sitting of petrochemical hub via hedonic models. Our result indicates that the sitting of petrochemical hub will influence the housing price in which those located nearby will experience higher appreciation in property prices. This study is essential in clearing the doubt that housing price will be negatively influenced by petrochemical hub. Our findings further indicate that there is a need to educate local residents on the impact of the industry cluster on their house, in mitigating local opposition due to concern over declination of housing price due to the sitting of petrochemical hub.

Keywords: Chemical Industry; Housing Price; Hedonic Model; Residential Transaction

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INTRODUCTION

The petrochemical industry is an important and strategic sector for Malaysia economic development. Essentially, the availability of feedstock at competitive price has positioned Malaysia as an important petrochemical hub in the Southeast Asia region. In total, there are six important petrochemical industry zones in Malaysia that attracted almost RM33 billions of investments in year 2018 (MIDA, 2020). These petrochemical zones are Kertih (state of Terengganu), Gebeng (state of Pahang), Tanjung Langsat, Pasir Gudang (state of Johor), Pengerang Integrated Petrochemical Complex (state of Johor), Bintulu (wilayah of Sawarak) and Spitang Oil and Gas Industrial Park (wilayah of Sabah).

Nevertheless, petrochemical facilities can be regarded as a negative externality that will affecting housing price, predominantly due to its production nature which generating significant amount of wastewater, air pollutant, toxic and hazardous waste, as well as odour and noise pollution (eg. Axelsson et al., 2013; Jain et al., 2020; Jia et al., 2021; Boonhat et al., 2022). Such externalities not only having adverse environmental impacts on the neighbourhood, but concern over health issues has invited disputes on the siting of the petrochemical hub in which it is argued that these externalities have driven residents and potential migrants away from the vicinity, thus, contributing to the decline in property value. Despite the abovementioned externalities, it is worth mentioning that unpleasant scenic view that is potentially associated with the industry site is contributing to the decrease in property value (Damigos and Anyfantis, 2011). Ironically, contaminated industry site will negatively affect the selling price of nearby industrial properties (Tonin and Turvani, 2014).

In order to examining and quantifying the impact of negative externalities associated with the operation of industry facilities, previous studies had employed, predominantly, hedonic modelling in estimating the externalities of industry site and hazardous facilities on housing price. De Vor and De Groot (2011) employed hedonic pricing model in estimating the effect of industry site on housing value. They referred distance as a proxy to quantify the negative externalities associated with the siting of industry site. Their study found that housing price rise with increasing distance from industry site located at the Randstad region and the Province of North-Brabant, Netherlands. An approximately 14.9% less in housing price being noticed for residential units located within 250 meters close to industrial site compared those located beyond 2,250 meters away.

In capitalizing pollution cost, Goodwin et al. (2021) reported a 1.3% decrease in housing value in Mexico City for every 10% increment in air pollution. Similarly, for every 10% increase in $PM_{2.5}$ concentration, there will be 2.4% decrease in housing price observed in Chinese cities (Chen and Jin, 2019). While interpreted in numerical figure, Chen and Chen (2017) reported a loss of CN¥46 per square meter, which will eventually contribute to a total of CN¥520

billion loss. This figure is estimated to be equivalent to 1% of China's gross domestic product. A more recent study by Tsai (2022) also reported similar findings. He found that there is a 25% drop in value for houses located within 15km from thermal power plant at Central Taiwan. The impact was greater for houses with high housing cost.

In Malaysia context, Azmi et al. (2012) revealed a potential negative correlation between the Malaysia Housing Index and Air Quality Index. Ling et al. (2020) had attributed negative relationship between the concentration of industrial land use and air quality. Their result further confirms the negative externalities needed to be capitalised into housing cost. Extended to the specific effect of industry site on housing price discussion, Azmee and Osmadi (2018) found that while there is an increase in house price recorded after the opening of Lynas plat at Gebeng Industry Area, the increment potential maybe limited as those housing estates located far away is experiencing higher increment in housing value. Similar findings were observed by Karunzaman et al. (2019) in Pasir Gudang, Johor. As a consequence, this may further lead to a drop in demand towards housing nearby industrial site (Yassin et al., 2021). Nevertheless, industry site located within urban area may have a positive effect on the property value (Jie and Burhan, 2020).

This study is expected to contribute to the discussion on the impact of industry site on housing market, from the perspective of petrochemical hub. It aims to examine the negative externalities of petrochemical hub on nearby residential units via the application of hedonic pricing model. In line with previous studies, distance between the residential unit and petrochemical hub will be referred as the proxy that capture the negative externalities with the assumption that residential units that are closer to the petrochemical hub will likely to experience the negative externalities than those located far away. On top of that, this study is unique as it is among the first that will capture the effect of distance between residential unit and city central in controlling for the trade-off effect of decay housing price (i.e., between distance and petrochemical hub) and increment of housing price due to closer to city central while located away from the petrochemical hub.

The subsequent will be arranged in sections. The study context and methodology employed in this study will be explained in research method section, followed by the findings presentation and discussion before it reaches to the conclusion.

RESEARCH METHOD
Study Area
Located at Gebeng, Pahang, Gebeng Industry Area was clustered as a petrochemical hub and had been established since 23 April 1997. It is covering an area of 7,357 acres which were developed via four phases. Among others,

Lynas Malaysia Sdn Bhd, Petronas subsidiaries, Shell (M) Trd Sdn Bhd and RP Chemicals (M) Sdn Bhd are among the multinational companies that are currently investing in Gebeng Industrial Area (PKNP, 2022). Gebeng Industry Area is well connected with accessibility and transportation hub. In term of accessibility, it is well connected to the East Coast Expressway while Kuantan Port is located only 7.5km away from the industry area. Its connectivity will be further enhanced when the East Coast Rail Link start its operation by year 2026. The development of Gebeng Industrial Area is illustrated in Figure 1.
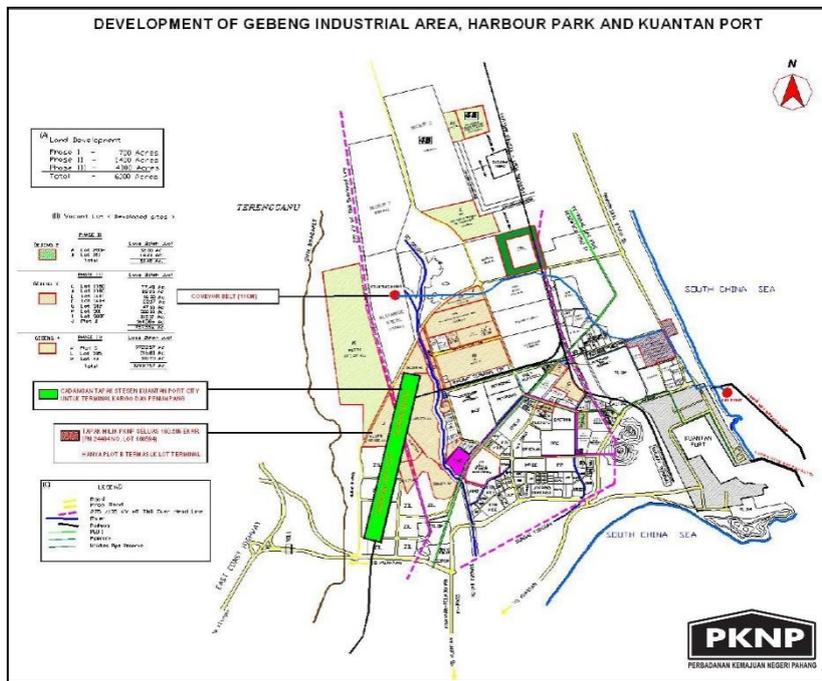
Figure 1: Gebeng Industry Area
Source: Pahang State Development Corporation

In term of housing settlements nearby Gebeng Industrial Area, the main housing estates hosted the residents are Taman Balok Perdana and Taman Balok Makmur. Other settlements nearby are sparsely populated. These include Kampung Sungai Ular, Kampung Hulu Balok, Kampung Gebeng, Kampung Berahi, Kampung Seberang Balok, Kampung Balok and Kampung Balok Baru and Kampung Selamat.

Descriptive Statistic

This study utilising residential units' transaction data of the year 2016-2022 located nearby Gebeng Industry Area in estimating the impact of the petrochemical hub on housing price. It has been summarised in Table 1.

Table 1: Descriptive Statistic of Selected Residential Units

Variable	N	Mean	Max	Min	Std
Price_ln	524	12.252	13.998	10.7144178	0.427
L_Area_ln	524	7.381	8.554	6.55058021	0.409
N_Storey	524	1.147	2.000	1	0.354
Semi-D*	524	0.107	1.000	0	0.309
Semi-D_Low*	524	0.095	1.000	0	0.294
Terrace_H*	524	0.594	1.000	0	0.492
Y_2017**	524	0.103	1.000	0	0.304
Y_2018**	524	0.153	1.000	0	0.360
Y_2019**	524	0.267	1.000	0	0.443
Y_2020**	524	0.225	1.000	0	0.418
Y_2021**	524	0.233	1.000	0	0.423
D_Gebeng	524	7.700	35.100	4.47	5.762
D_Kuantan	524	14.912	18.460	1.6	2.422

*Note: Price_ln=House price in logarithm form; L_Area_ln = Land area of a residential uni in logarithm form; N_Storey =Number of storeys for a residential unit; Semi-D = Typical Semi-Detached House; Semi-D_Low = Low Cost Semi-Detached House; Terrace_H= Typical Terrace House; Y_2017-Y_2021 = Transacted residential units for year 2017, 2018, 2019, 2020, and 2021;D_Gebeng= Distance between residential units and Gebeng Industry Area in Kilometres (km) ; D_Kuantan= Distance between residential units and Kuantan City Centre in Kilometres (km); *Low cost terrace house and ** Year 2016 act as base dummy for its group respectively.*

Table 1 depicts the descriptive statistic of selected residential units. Generally, these are the variables that used to assess the impact of petrochemical hub on the surrounding residential units. The composition of residential units consists of low cost terrace, semi-detached house, low cost semi-detached house which ranged from one floor to 2 floors. The transacted period is ranged from year 2016 until 2021. Most of the transactions were contributed in year 2019, 2020 and 2021. There are two areas have been identified in this study namely Gebeng Industrial area and Kuantan City Centre. Both areas play significant role in supporting the economic activities in Pahang state. The distance for the residential units to access Gebeng Industrial area and Kuantan City Centre is ranged from 4.47km – 35.10km and 1.6km-18.46 km respectively.
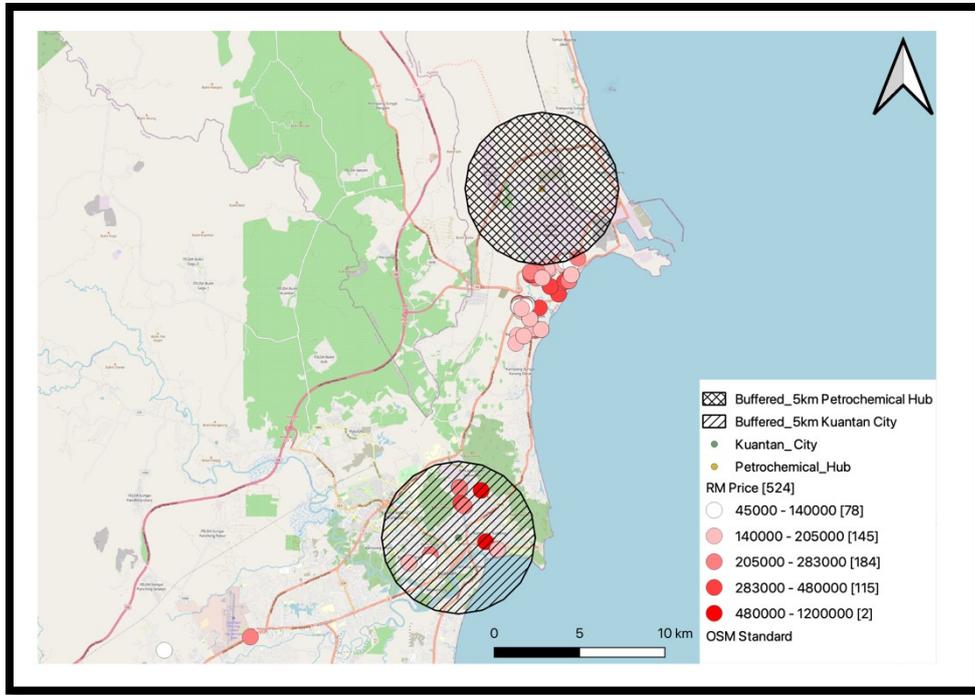
Figure 2: Distribution of Residential Units for Year 2016 - 2022

As indicated in Figure 2, beside the proximity distance between residential unit and the petrochemical hub, this study is unique as it is among the first that will capture the effect of distance between residential unit and city central in controlling for the trade-off effect of decay housing price (i.e., between distance and petrochemical hub) and increment of housing price due to closer to city central while located away from the petrochemical hub.

Ordinary Least Square Model
Additionally, this section will reveal the research methodology that used to assess the impact of petrochemical hub on residential property price. This study has adopted Ordinary Least Square (OLS) Model to compute the marginal contribution of each variable on property price. As claimed by Rosen (2019), a hedonic model can be utilised to examine the implicit value of the variables. Thus, a hedonic model is formed to achieve to the objective of this study as follows:

$$\text{Price\_ln}_{it} = \alpha + \beta_1 \text{L\_Area\_ln}_{it} + \beta_2 \text{N\_Storey}_{it} + \beta_3 \text{Semi} - \text{D}_{it} + \beta_4 \text{Semi} - \text{D\_Low}_{it} + \beta_5 \text{Terrace\_H}_{it} + \beta_6 \text{Y\_2017}_{it} + \beta_7 \text{Y\_2017}_{it} + \beta_8 \text{Y\_2018}_{it} + \beta_9 \text{Y\_2019}_{it} + \beta_{10} \text{Y\_2020}_{it} + \beta_{11} \text{Y\_2021}_{it} + \beta_{12} \text{D\_Gebeng}_{it} + \beta_{13} \text{D\_Kuantan}_{it} + \varepsilon_{it} \text{ ---Equation (1)}$$

The dependent variable of the model is represented by residential price in logarithm form. It is regressed on the independent variables such as L_Area_ln, N_Storey, Semi-D, Semi-D_Low, Terrace_H, Y_2017, Y_2018, Y_2019, Y_2020, Y_2021, D_Gebeng and D_Kuantan. The coefficient of each variable is indicated by $\beta_1 - \beta_{13}$. The positive sign of coefficient shows a positive relationship between residential price and the variables or vice versa. Both α and ε_{it} are constant and error term of the model.

FINDINGS

The quality of neighbour is one of major factors to be considered for home purchased. The disposal of hazardous chemical products without proper process from petrochemical hub could affect the public health. Generally, the concern over the health will hinder people from buying residential properties in the vicinity of petrochemical hub. Subsequently, these properties might be sold at discounted price. To conclude the general assumptions, the output of regression model based on equation 1 has been computed as follows:

Table 2: Output of Regression Model

Variables	Coefficient	Std Error	t-value	p-value	Expected Sign
L_Area_ln	0.4734	0.035	13.414	0.000	+
N_Storey	0.3298	0.033	9.907	0.000	+
Semi-D*	0.3853	0.053	7.238	0.000	+
Semi-D_Low*	-0.3423	0.043	-8.029	0.000	+
Terrace_H*	0.2457	0.030	8.221	0.000	-/+
Y_2017**	0.5391	0.079	6.853	0.000	-/+
Y_2018**	0.5328	0.076	7.035	0.000	-/+
Y_2019**	0.6094	0.074	8.285	0.000	-/+
Y_2020**	0.6268	0.074	8.467	0.000	-/+
Y_2021**	0.6612	0.074	8.887	0.000	-/+
D_Gebeng	-0.0155	0.002	-6.927	0.000	+
D_Kuantan	-0.0192	0.005	-4.248	0.000	-

Dependent Variable: Price_ln
Adjusted R -squared: 0.725
N=524
AIC: -68.21
BIC: -12.81

Note: Price_ln=House price in logarithm form; L_Area_ln = Land area of a residential uni in logarithm form; N_Storey =Number of storeys for a residential unit; Semi-D = Typical Semi-Detached House; Semi-D_Low = Low Cost Semi-Detached House; Terrace_H= Typical Terrace House; Y_2017-Y_2021 = Transacted residential units for year 2017, 2018, 2019, 2020, and 2021;D_Gebeng= Distance between residential units and Gebeng Industry Area in Kilometres (km) ; D_Kuantan= Distance between residential units and Kuantan City Centre in Kilometres (km); *Low cost terrace house and ** Year 2016 act as base dummy for its group respectively.

Table 2 had shown the output of regression model. The model is constructed based on 524 transacted data covering 2016 – 2022. Most of the variables are contributed significantly (p-value <0.05) to the residential prices. The influence on property prices for each variable is evaluated based on the sign of coefficient. In overall, there are two variables namely Semi-D_Low and D_Gebeng conflict with its expected coefficient sign. The base variable that used for property type is low cost terrace house. According to the normal scenario, low cost Semi-Detached house is more expensive than low cost terrace house. This is because Semi-Detached house occupied larger space and it has more privacy as compared to low cost house. However, the limitation in terms of sample size and information has hampered further investigation on this scenario.

Apart from that, D_Gebeng shows a negative coefficient or -0.0155. In other words, the residential price will be dropped 1.54% for every kilometre away from the petrochemical hub. In contrast to the previous studies by Tsai (2022) where he claimed that there is a 25% drop in value for houses located within 15km from thermal power plant at Central Taiwan. Nevertheless, this study supported by Jie and Burhan (2020), the industry site located within urban area may have a positive effect on the property value. Besides, the residential units which near to Kuantan City Centre exerted a higher price in accordance with Table 2 and the coefficient value for D_Kuantan is -0.0192. Therefore, the residential prices will be dropped -1.90% for every kilometre away from the Kuantan city. The result is reasonable because Kuantan city as a Central Business District (CBD) tends to give more impact on the residential prices. Gebeng industry area and Kuantan city played the important role in providing job opportunities to the public. Therefore, a proper management on petrochemical hub will not create worry among homebuyers when buying residential properties in the surrounding of Gebeng industry area

CONCLUSIONS
Our result indicates that the sitting of petrochemical hub will influence the housing price in which those located nearby will experience higher appreciation in property prices. This study is essential in clearing the doubt that housing price will be negatively influenced by petrochemical hub. Our findings further indicate that there is a need to educate local residents on the impact of the industry cluster on their house, in mitigating local opposition due to concern over declination of housing price due to the sitting of petrochemical hub.

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DATA-TYPE ADJUSTMENT FOR RESIDENTIAL PROPERTY VALUATION IN JAKARTA: AN EXPLORATORY STUDY

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Abstract

Valuers model market behaviour to estimate market value in property valuation. This requires a sufficient number of arm's length transaction price as comparables. In the Indonesian context, this proves to be difficult given the lack of market transparency. Thus, valuers often rely on asking price in their analysis. This may affect the accuracy of their value estimate as asking price does not represent property market. Asking price needs to be adjusted to arm's-length transaction better. This research seeks to study the magnitude of such adjustment. For this purpose, asking price and their corresponding transaction price of 331 properties in Jakarta were analysed. A questionnaire was also administered to capture the adjustment commonly used by valuation practitioners. The data shows that on average, asking price is 6% higher than its transaction price with no significant differences across areas in Jakarta. This is far below the 14% average adjustment used by valuers in their practice.

Keywords: asking price, valuation, adjustment, residential property

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BACKGROUND

Valuation is a product of human judgment (Gallimore, 1996). Value is an economic construct that refers to the price that is what is most likely agreed by buyers and sellers. Value, thus, is what a buyer should pay in a transaction. Value becomes transaction price when both buyer and seller are in agreement. Therefore, value is not a fact, but rather an opinion that is likely to be paid at a particular time under certain definition of value (Harjanto & Hidayati, 2014). There are several approaches often employed by valuers to arrive at an opinion of a fair market value. One approach widely used by practitioners in Indonesia is the market data comparison approach (Isakson, 2002). This approach attempts to estimate property market value by investigating comparable property transactions in a particular market.

It is, however, often difficult to accurately apply this approach in Indonesia. This is because obtaining reliable property transaction price is difficult. There is no single institution in Indonesia that is responsible for property data collection and then make it available for public. As such, valuers often rely on asking price in their practice. Although this simplistic approach is theoretically sound under limited circumstances (Appraisal Institute, 2020) and is also allowed under current regulation in Indonesia (MAPPI, 2018), one should recognise that asking price does not reflect market condition. It, by definition, only represents sellers' view. A counteroffer, which certainly is absent if asking price rather than transaction price is used in the analysis, is required to allow a negotiation process to take place that may, or may not, lead to a price that reflect a fair market condition. Asking price is bound to differ from transaction price. As a result, it should not be used by valuers in their market value analysis as it will generally lead to incorrect value estimate (Riyanto, 2020).

It is, however, generally difficult to have a reliable transaction data, a problem shared by most developing countries (Abidoye & Chan, 2018). On the other hand, using asking price instead of transaction price in market data approach is also problematic due to the said reason. There is however evidence found in Lagos, Nigeria in a study conducted by Olaleye (2019) where there is a significant link between a property's asking price and its transaction price. The study also reveals that on average, a property transaction price is approximately 87% of its asking price. As such, a -13% of adjustment is required for an asking price to arrive at an estimate of its transaction price. This is what is referred to in this article as a data-type adjustment. Thus, the use of asking price in property valuation is justified as long as it is property adjusted. Nevertheless, research that study the relationship between asking price and transaction price in the extant literature, to the best of our knowledge, is limited. This study aims to quantify data-type adjustment in the Indonesian context, particularly in Jakarta residential property market where transactions are more likely to be available. For this purpose, it attempts to answer the following questions:

1. What is the percentage of data-type adjustment that is required to arrive at a transaction price estimate?
2. Is there a significant association between data-type adjustment and the use of intermediaries in residential property transactions?
3. Is there a significant association between data-type adjustment and the duration of the property in the market?

METHOD AND DATA DESCRIPTION

The problem of limited data transaction in property valuation is found in both developing as well as developed nations such as the United States (Baum & Hartzell, 2020, p. 118) and Italy (Curto et al., 2015, p. 97). This leads to the use of asking price as it can be taken as a proxy of transaction price (Curto et al., 2015, p. 97) so long as it is properly adjusted. A number of factors however need to be considered for this purpose. This for instance includes the use of intermediaries (Rutherford et al., 2005; Levitt and Syverson, 2008; and Zhang et al., 2019) and the length of a particular property offered in the market (Allen et al., 1987; Asabere et al., 1993; Asabere & Huffman, 1993). Based on this literature, this study uses a conceptual framework shown Figure 1 in its attempt to answer the questions raised in the preceding section.
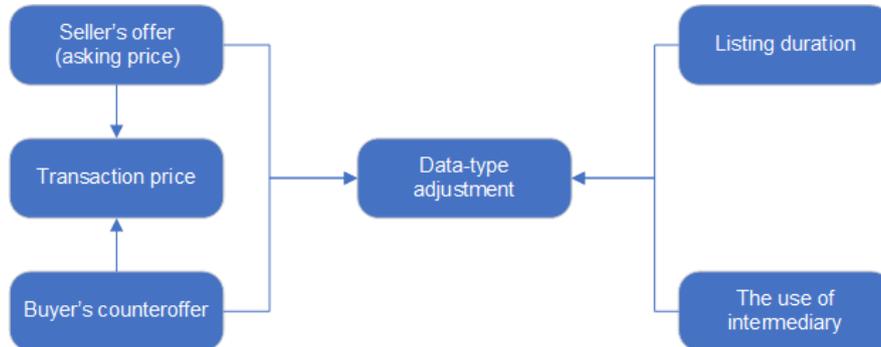
Figure 1: Research Framework

This study analyses a total of 1,400 property data collected by from the Directorate General of State Assets containing property asking price. This reflects the highest price that a seller wants (Chinloy, 1980). A potential buyer will bid asking price down to reflect their preference. Consequently, a transaction price is less than its corresponding asking price. Song (1995, p. 607) refers to the difference between asking price and transaction price as a bargaining outcome (Equation (1)). This is the same as the data-type adjustment referred to earlier. OP in Equation (1) is asking price whereas TP is its corresponding transaction price.

$$Data\ type\ adjustment = \left(\frac{OP - TP}{OP}\right) \times 100\% \tag{1}$$

Outliers were identified using quartiles suggested by Tukey (1977) (Equation (2)) and afterwards, the Mahalanobis distance. Q3 in Equation (2) refers to quartile 3 and IQR is the inter-quartile range of the said 1,400 data. This part of data analysis is crucial as asking price only represents a seller's view of a property transaction. Because seller generally has an incentive to make their property sells at a higher price, then asking price data is normally skewed.

$$Upper\ fence = Q_3 + (1{,}5 \times IQR) \tag{2}$$

The identification and removal of outliers resulted in 613 records. Out of these, 120 were excluded as they were from outside Jakarta. A telephone survey was conducted on these data to obtain their transaction price. It was then known that further data removal of 117 records as they were higher than asking price (6 records) or transaction price was unavailable (111 records) leaving 331 data records for further analysis (Table 1).

Table 1: Distribution of Transaction Data

No	City / Region	Frequency
1	Central Jakarta	14
2	Wes Jakarta	87
3	South Jakarta	91
4	East Jakarta	92
5	North Jakarta	47
Total		**331**

Table 2 lists property key attributes for data analysis. As can be seen, this dataset also includes geographic coordinates that are useful to plot the property transactions in a geographic information system (GIS) software.

Table 2: Data Variables

No.	Property Characteristics	Variables
1	Transaction Intermediaries	PERANTARA
2	Period for which the property is offered.	DURASI_PENAWARAN
3	Asking price	PENAWARAN
4	Transaction price	TRANSAKSI

No.	Property Characteristics	Variables
5	Data type adjustment	PENYESUAIAN
6	District of property location	KEC
7	City of property location	KOTA
8	Data adjustment class	GOL_PENYESUAIAN
9	Transaction data coordinates (longitude)	BUJUR
10	Transaction data coordinates (latitude)	LINTANG

This study also uses data-type valuation obtained from property valuation practitioners using online survey. In total, there were 163 respondents completed the survey.

RESULTS AND DISCUSSION

This section describes the results of data analysis both from the questionnaire and field survey and thus provides answers to the research questions. Most data calculation was conducted using JMP 16 and Stata 14. In answering the first question, from the questionnaire data, it was found that those completing the online survey applied a median of 10.00% (IQR=7%; 15%) of data-type valuation in their property value estimates. Most of them were either confident (60.74%) or rather confident (24.54%) on the accuracy of the data-type adjustment that they usually use. It is however interesting to note that around 45% of the respondents admitted that they or the company that they work for never did a scientific study on data-type adjustment. Most generally relied either on their own judgment (44.79%) or course material (23.93%) as their source of adjustment. It is also interesting to note experienced practitioners (at least 6 years of practice) tend to apply lower data-type adjustment at 1.67% compared to less-experienced respondents (less than 1 year of practice) who on average applied 8.75% adjustment.

Moving on the results obtained from the field survey data, it can be seen from Figure 2 that the data-type adjustment from 331 records do not seem to follow the normal distribution. The Anderson-Darling (AD=12.08; $p<0.01$) and Shapiro-Wilk (SW=0.87; $p<0.01$) test results provide support for this as well. As such, further analysis will be carried out using nonparametric procedures. Equivalent parametric tests occasionally will also be carried out for comparison purposes.

Figure 2: Distribution of data type adjustments

It can further Table 3 in be seen that the median of data-type transaction is 5.71% (IQR=2.67%; 10.00%). This is significantly lower than the median adjustment of 10% used by valuation practitioners (z=-13,981.50; p<0.01). The largest data-type adjustment median is found in central Jakarta where properties are sold at approximately 93% (median adjustment of 7.07% (IQR: 3.85%; 12.50%)) of their asking price. By contrast, properties in West Jakarta generally are sold at a higher level compared to other regions. Here, properties generally are sold at around 95% of their asking price (median adjustment of 5.08% (IQR: 1.79%; 8.06%)). Some transactions apparently have an adjustment of 0% which means that their transaction and asking price are the same. On the other hand, there are certain properties in East and South Jakarta that are sold only at 70% of their asking price. All in all, the data shows that it seems that properties in Jakarta are sold at approximately 94% of their asking price without significant differences across regions (c^2(4, 331) =4.21; p=0.38). The ANOVA test supports this (F (4, 326) =1.54; p=0.19).

Table 3: Data-Type Adjustment Across Regions

CITY	DATA TYPE ADJUSTMENT					
	Median	**Min**	**Max**	**Q_1**	**Q_3**	**IQR**
Central Jakarta	7.07%	1.92%	26.00%	3.85%	12.50%	9.35%
West Jakarta	5.08%	0.00%	25.00%	1.79%	08.06%	6.28%
South Jakarta	6.22%	0.00%	30.00%	3.03%	10.34%	7.31%
East Jakarta	5.78%	0.00%	31.58%	2.24%	10.00%	7.77%
North Jakarta	5.76%	0.00%	25.00%	3.85%	12.50%	8.65%

Figure 3 provides a geographical presentation of data-type medians across regions in Jakarta.
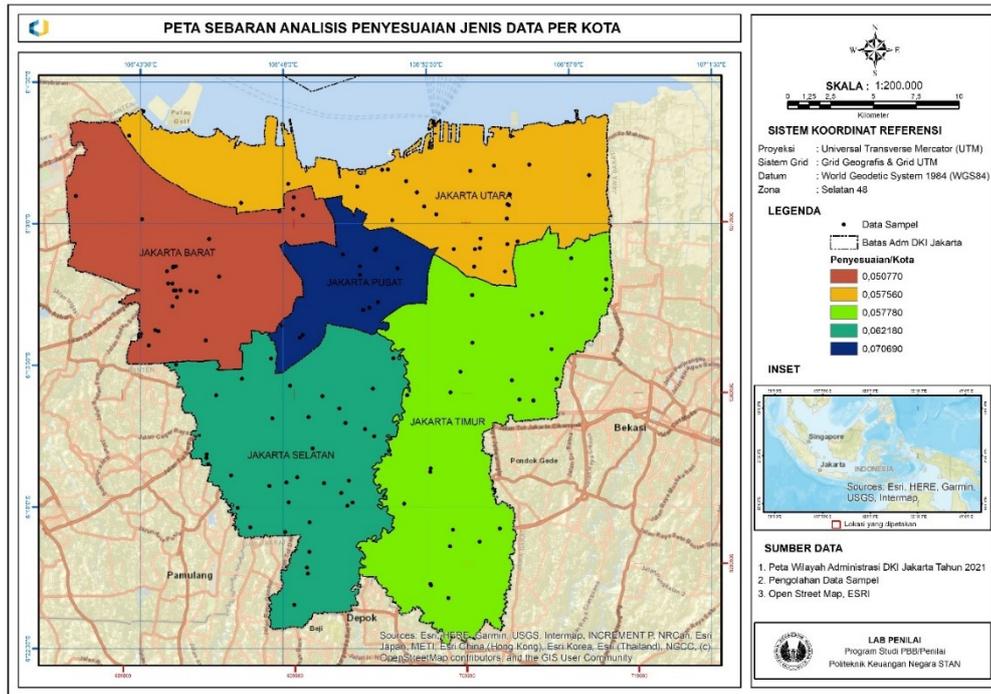
Figure 3: Map of Data-Types Adjustment

At the district level – as shown in Table 4 – the lowest median of data-type adjustment is in Kalideres at around 1.96% (IQR: 0.99%; 5.79%) while Tebet, on the other hand, has a much higher median adjustment of 10.71% (IQR: 5.88%; 14.06%). Hence, consistent with the regional level, properties in Kalideres in West Jakarta are generally sold at a higher level of their asking price than those in Tebet in South Jakarta.

Table 4: Data Type Adjustment Across District

DISTRICT	ADJUSTMENT					
	Median	**Min**	**Max**	**Q₁**	**Q₃**	**IQR**
Cakung	4.23%	0.00%	21.43%	1.71%	10.81%	9.48%
Cempaka Putih	9.17%	1.92%	20.00%	4.65%	13.73%	10.10%

DISTRICT	ADJUSTMENT					
	Median	Min	Max	Q_1	Q_3	IQR
Cengkareng	5.71%	0.00%	25.00%	2.86%	7.41%	11.01%
Cilandak	4.98%	1.78%	25.60%	4.14%	10.00%	6.58%
Cilincing	9.09%	3.03%	24.44%	5.30%	22.50%	17.20%
Cipayung	5.56%	0.00%	14.74%	0.37%	10.00%	9.63%
Ciracas	3.83%	0.00%	31.43%	2.17%	25.00%	22.83%
Duren Sawit	6.28%	0.00%	31.58%	1.75%	10.00%	8.42%
Grogol Petamburan	4.26%	0.00%	18.75%	1.85%	6.06%	4.21%
Jagakarsa	7.55%	0.00%	30.00%	2.86%	10.34%	7.95%
Kalideres	1.96%	0.42%	23.53%	0.99%	5.79%	4.80%
Kebayoran Lama	5.36%	0.00%	21.43%	2.17%	9.76%	12.87%
Kebon Jeruk	5.26%	0.47%	18.75%	1.62%	7.69%	6.07%
Kelapa Gading	7.87%	0.00%	23.91%	4.44%	12.50%	8.06%
Kemayoran	6.56%	1.96%	26.00%	3.51%	8.00%	9.38%
Kembangan	5.60%	0.00%	22.41%	1.87%	9.09%	7.22%
Kramat Jati	5.50%	0.00%	10.53%	1.41%	6.25%	6.26%
Mampang Prapatan	8.35%	6.04%	10.71%	6.06%	10.71%	4.66%
Matraman	7.28%	2.44%	20.00%	4.63%	10.61%	6.60%
Pasar Minggu	7.73%	0.27%	20.00%	3.43%	8.93%	5.95%
Penjaringan	3.11%	0.35%	7.74%	1.14%	4.88%	3.82%
Pesanggrahan	4.67%	0.00%	28.57%	0.92%	6.01%	5.35%
Pulo Gadung	5.77%	2.27%	24.00%	4.28%	8.33%	7.15%
Tambora	5.43%	0.38%	8.33%	0.78%	5.98%	5.89%
Tanjung Priok	8.00%	0.00%	25.00%	5.28%	14.81%	11.59%
Tebet	10.71%	2.33%	16.00%	5.88%	14.06%	9.09%

Moving on to the second research question, this study looks at the association between data-type adjustment and the use of intermediary in residential property transactions. Most of properties – around 84% – in this study are sold using an intermediary. On the other side of the coin, only just over 16% are sold by their owners.

Using a simple cross tab, it can be seen that there indeed a significant association between the use of intermediary and the level of a transaction price of a property from its asking price ($\chi^2(2, 331) = 7.85$; $p = 0.02$). a biserial point correlation between the use of intermediaries (with or without intermediaries) and the amount of data type adjustment was then computed and showed a significant – albeit weak – correlation between the two attributes ($r(329) = -0.12$; $p = 0.03$). Note that properties sold without intermediary are coded with 0. The negative correlation hence shows that those sold with an intermediary tend to have a transaction price that approaches their asking price. This study however fails to find evidence that properties sold using intermediaries shortens the duration of a property in the market ($r(329) = 0.04$; $p = 0.51$), which is consistent with what is described by Rutherford et al. (2005).

Literature in this context supports that properties sold through an agent are sold at a higher price than those that are not (Levitt & Syverson, 2008). This is perhaps because agents generally have more knowledge about property market condition in the neighbourhood (Zhang et al., 2019). This means they are able to estimate the optimum time to put a certain property on their listing.

Lastly, for the third research question, this study seeks to examine the association between the length a property offered in the market and its data-type adjustment. The difficulty faced during data collection is that it was often for property owners or sellers to be unable to provide a complete information with regards to the date their property was sold. They instead, only provided an approximate month of when the transaction was entered into. To deal with this issue, this study categorises the duration a property offered in the market – in term of months – into five groups (Table 5).

Table 5: Property Listing Duration Category

No	Category (month)	Frequency
1	0-6	224
2	7-12	41
3	13-18	14
4	19-24	7
5	>25	45
	Total	**331**

The data-type adjustment was then classified into three categories (Table 6). This made analysis using cross tabulation possible. A polychoric correlation was able to be computed as well.

Table 6: Data type adjustment group

No	Category	Adjustment Range	Frequency
1	Low	0%-3%	93
2	Moderate	3%-10%	160
3	High	>10%	78
Total			**331**

The results show that the property transaction data used in this analysis fails to provide support for a significant association between the length a property is offered in the market and its data-type adjustment (χ^2 (8, 331) =5.13; p=0.74). The correlation between the two attributes is also found to be statistically insignificant (r=0.08; Pearson G2=4.36; p=0.74). This means that – contradicts to what is reported by Asabere and Huffman (1993) but is consistent with Allen et al. (1987) – there is no evidence to suggest that properties that are longer in the market are sold at a higher level of their asking price.

CONCLUSION

In a nutshell, this study concludes that firstly, asking price of residential properties in Jakarta require a -6% adjustment to arrive at an estimate of their transaction price with no significant differences across regions. This proves to be far lower than similar adjustment used by practitioners in their market value analysis of -10%.

Secondly, this study provides evidence that the use of intermediary in a residential property transaction may lead to a higher level of transaction price. It is however important to note that such intermediary may not be able to shorten the length of a property offered in the market.

Lastly, it can be seen here that there is no evidence in this study to support the claim that the longer a property is put in the market, the more expensive it will be. This contradicts the findings identified in the literature that suggest a positive correlation between the two.

LIMITATION

This study has some limitations. First, the research focuses on property transaction data of DKI Jakarta. As a consequence, the findings reported in this study may not be applicable in other areas. Second, the data were collected in 2017 with a further validation conducted in 2021. This may affect the accuracy of the estimated transaction price and the length of time the property is offered.

Some property owners, for example, do not remember exactly how long their properties are offered in the market.

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DIGITALIZATION OF SUSTAINABLE INTEGRATED PROPERTY MANAGEMENT FOR AFFORDABLE STRATA HOUSING

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Abstract

The main problem faced by the joint management building (JMB) in the management of strata buildings is in the aspect of taking action against residents who refuse to pay the building management fee. The management of JMB itself faces problems in the proper way of managing the building management system and facilities, financial systems and community-based communication systems. In addition to the building management system which is still operated manually, the management of financial management fee collection is still implemented in a separately. Moreover, dissatisfaction of residents in terms of delayed in corrective maintenance management action of strata buildings, correlate to poor fee payment and further put pressure on the sustainable continuity of strata housing management. Digitalization of sustainable integrated property management which includes aspects of financial management, dissemination of communication within the community and safety and security in the management of affordable strata housing needs to be given special attention. This study proposes a framework for digitalization of sustainable integrated property management for affordable strata housing that the system is able to harmonize various aspects of the needs of strata residents to create a strata liveable life. This will then will be realized through the development of web-based system for the purpose of commercialization of sustainable integrated property management system for affordable strata housing that beneficial for the well-being of strata building residents as well as the JMB.

Keywords: sustainable integrated property management, digitalization, strata liveable life

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INTRODUCTION

Conflicts often occur between the joint management bodies (JMB) and the owners of affordable strata housing unit following dissatisfaction with the quality of property management services and the commitment to pay building management fees that are accountable for the residents in accordance with the provisions of the Strata Management Act 757 (Wang, et. al., 2021; Sia, et. al., 2017 and Christudason, 2007). The weakness of disseminating information regarding JMB's financial position report and management response to damage complaints made by residents due to manual property management and lack of integration between the property management and financial management components. The development of affordable housing is to meet the needs of the underprivileged for the purpose of owning a home (Ariff and Davies, 2021 and Yap and Ng, 2017). Due to the high land value in the main city, most affordable houses are built in the form of high-rise and strata buildings, compared to rural locations, the management of strata building is jointly managed by a JMB with their respective discretion under the provision of Strata Management Act 757 (Zainudin and Hussin, 2015). A guideline regarding financial management procedures is issued by the Ministry of Housing and Local Authorities, but it is of a very general nature and financial management is done manually. In creating a conducive residence where strata owners can live together under one roof and enjoy the same living facilities, perfect property management needs to be implemented. Efficiency of elevator and lift facilities, common area, basic amenities, pedestrian walk and a good level of cleanliness are also important (Sia, et. al., 2017 and Christudason, 2007). In addition, damage to the piping system, sewage outflow channels from units in strata buildings is also an aspect that often becomes a major complaint and issue in the management of a JMB (Christudason, 2003).

Complaints of damage in the interior and external of the building were reported by the strata unit owners were not resolved quickly, even torturing the life in the strata building was among the problems that were often highlighted (Sia, et. al., 2017). At the same time, for the financial sustainability of managing an affordable strata housing or low-cost housing strata, the collection of building management fees contributed by unit owners is JMB's main expected source of income (Christudason, 2009). This source of fee contribution from the owner unit, it helps JMB to provide a more perfect property management, which covers planned periodic maintenance costs, maintenance costs for damage repairs and sinking fund allocation for the purpose of any desperate financial needs that are unforeseen in the future (Christudason, 2004). However, the property management managed by JMB does not go as planned, maintenance is carried out not without prioritizing the use of certain facilities, resulted over-utilized of financial resources, damage is not repaired immediately and the delay in repairing damage becomes an inconvenience to the unit owner (Ebekozien, et. al., 2022

and Guilding, et. al., 2014). Furthermore, information about the repairs carried out is not distributed to the residents with proper manner, causing a bad perception among unit owners towards the management of affordable strata housing management (Sia, et. al., 2017).

In the meantime, the provision of Act 757 legislation, strata management has empowered JMB to proceed with court action against unit owners who are negligent in making the payment of building management fees. This became a dispute between the unit owner and JMB when the unit owner was placed in charge of the commitment to pay management fees by law, yet, the quality of real estate management services supervised by JMB was poor (Wang, et. al., 2021 and Christudason, 2003). Loss of trust by unit owners to fulfill the commitment to pay property management fees, cause a big problem to the financial self-sustain of the JMB in the future, and this will in turn be an additional problem to the JMB's ability to provide efficacy real estate management services to affordable strata housing (Sia, et. al., 2017 and Christudason, 2009; Christudason, 2007). The coordination of property management and financial management, especially the collection of property management fees, is critical and requires special attention to ensure the self-sustainability of the JMB. Financial aspects play an important role in determining the JMB's ability to appoint and pay contractors for the maintenance costs of the strata building. A general survey found that most JMBs in affordable strata housing still collect property management fees manually. Although payment collections are made to JMB's bank account, manual account reconciliation is still carried out to determine which unit owners have paid their contribution for each month. Meanwhile, property management still receives damage complaints from unit owners also made manually through the use of a paper complaint form provided by JMB. Time limitation among unit owners who work all day to make complaints physically at the JMB office, causing damage not to be reported as soon as possible and the effects of damage tormenting the lives of residents (Christudason, 2004).

Residents' dissatisfaction with the treatment of damage complaints made, causing them to often ignore the payment of maintenance fee claims billed to them. This worsens the management of JMB which is facing financial problems due to lack of cash flow to fund maintenance work payment requirements such as appointed sub-contractors and other payments. The situation that continues to the stage of establishing the management corporation (MC), because the management existing carried out manually. Therefore, sustainable property management in affordable strata housing requires financial management component integration with property management component. Through digitization between both components which has been done separately before, the annual financial reports can be generated accurately and damage analysis in strata buildings can be identified to enable appropriate corrective

actions to be taken by JMB's collective decision during the annual general meeting (Wang, et. al., 2021). Through survey questionnaires among JMB, this study can highlight the relationship between the property management component and the financial management component to form a framework for sustainable property management in affordable strata housing. This framework is important for the digitization process of integrated property management system for sustainable affordable strata housing which will be done through the next prototype research phase.

PREVIOUS LITERATURE
Professionalism and Good Governance Practice
Malaysian Ministry of Housing and Local Authority "Kementerian Perumahan & Kerajaan Tempatan" (KPKT) has issued a guideline regarding the standard operating procedures on how strata building management is handled, yet it is mentioned in general term. The understanding of resident rights and the need to respect other resident is essentials to be emphasized to ensure the well-being of this shared residence. Building damage reports involving leaks between the upper floors and causing problem for used on the lower floor require the tolerance of both residents. The problem of the dispute of the responsibility to repair the damage is clearly stated through the Strata Management Act 757, but its implementation depends on the enforcement and actions of the JMB or MC (Christudason, 2009). Therefore, it is necessity that only professional personnel are allowed to manage strata building as accordance with the provision of Malaysian Property Management Standard (MPMS) introduced by the Board of Valuers, Appraisers, Agents and Property Managers Malaysia. For which the standard clearly states that in respect of property management is governed by the Valuers, Appraiser and Estate Agents Act 1981 (Act 242) that defines property management and the roles of the property managers in the management of properties. The standard also specifies the duties, qualification and code of conduct of the property manager.

Apart from that, the governance of JMB or MC also in terms of procurement of maintenance or supply services needs to be transparent. All the costs that are spent are the result of resident's fee collection fund, for which this is as accordance to the Guidelines for the Procurement Method of Strata Building Management Strata Management Act (Act 757) introduced by KPKT in 2013. Essential principals of accountability, transparent management, best value benefits, open competition, truth and fair is highlight as well as the practice of good governance and integrity pact among committee member related to strata procurement. Likewise, the enforcement of payment default collection resulted dissatisfaction among residents. Therefore, the enforcement of integrity in the aspect of financial management (Wang et al., 2021: and Christudason, 2008). This is aligned with the Act 757, section 34 which clarified the procedure for

obtaining the amount due from plot owner. The responsibility of organizing the annual general meeting (AGM) is also explained as a mechanism to create a spirit of togetherness among the unit owners. The GM provides an opportunity for unit owners to make suggestions for continuous improvement to JMB or MC, yet it can also act as forum to express the unit owner's dissatisfaction as a client with the quality of property management services provided (Ariff and Davies, 2009; and Christudason, 2008).

Database Management's transparency of information
Basic information about the owner's unit or even the unit being rented to a tenant to the owner's unit must be stored in the database. Issue on the rental by the unit owner without the acknowledgement of JMB management and the whereabouts of the tenants and dependents are unknowns, in addition to the problem of tenants who often change. Most of the strata residential properties in big cities that have high commercial potential are often the instruments of real estate investors. However, the responsibility for the plot unit belongs to the unit owner and any permission to rent must be notified to JMB management for the purpose of security and privacy privileges of the respective unit owner (Yap and Ng, 2017; Che-Ani et al., 2009; Christudason, 2008). An organized database, assist the JMB to obtain prescriptive data regarding the number of complaints lodged by the unit owner/residents and this helps to find out whether there are components in the unit building that are often problematic and corrective measures for repair can be suggested. Damage trends that are often reported can help JMB make decisions to repair so that it does not happen again, this can also reduce the number of complaints in the future (Wang et al., 2021; and Guilding, 2014)

In addition, the issue of the financial ability of the strata building to cover the expenses of the strata building is very crucial. The collection of management fees seems to be unable to cover the expenses of the strata building as expected. This problem becomes complicated when repairs and maintenance cannot be carried out as expected and it causes JMB to continue to be unable to spend due to cash flow problems and insufficient financial ability. A high-quality database can also help the JMB unit's finance department to identify the trend of building management fee payments billed to unit owners. Reminder notices can be generated automatically and reduce the problem of payments not settled by the unit owner. Therefore, through data on the frequency of complaints and the amount of money spent to overcome each complaint can be used as strong evidence to be presented during the AGM for the proposal to charge an appropriate property management fee.

Property management practices and quality
Real estate management needs to be carried out in the best possible way to achieve the objective of providing living comfort, safety, and tranquillity to

building occupants, whether residential or commercial. In addition to ensuring the sustainability of real estate, adapting to economic changes, cultural changes, technology and the challenges of residents' expectations in property management. Property management needs to be run as a service that is ready at the level of service quality agreed with the client. The issue regarding the level of service quality agreed with the client also need to be followed according to the rationale of charging a reasonable management fee.

Planned maintenance that is carried out well can provide satisfaction to the occupants in addition to ensuring that damage complaints can be reduced. However, the extent to which planned maintenance is effective is very much a trial and error process. In a certain phase, planned maintenance can be suggested to be improved if the frequency of complaints increases, but in another phase, it can also be reduced if the frequency of complaints is not as expected (Ebekozien, 2022; and Wang et al., 2021). Reducing the numbers of planned maintenance work can reduce the cost of expenses, but this consideration needs to take-into account life-cycle costing estimation for the need to guarantee the lifespan of a building component. If an excessive reduction in planned maintenance is made, it will cause great losses in the future, due to the consideration of life-cycle needs of the building component being set aside.

Apart from that, the database regarding the monitoring of planned maintenance work is very necessary for easy access to information. Recording how real estate supervisors regularly monitor the maintenance of property management, in addition to the completed service quality assessment is necessary for JMB reference purposes (Wang et al., 2021: and Christudason, 2008). This can assist JMB make decisions in the future for the re-appointment of the maintenance contractor or otherwise, and is also required for reporting at the next strata AGM. The issue of unit owners' dissatisfaction with JMB's actions in dealing with reported complaints is the main factor that drives management fees to be unpaid, and affects the financial ability of JMB. The damage complaint record is done manually which requires the unit owner to personally lodge the complaint at the JMB office, causing the repair of the damage to be delayed and the unit owner to suffer continuously. Damage complaint recording data can help JMB identify the frequency and trend of damage in a building, in addition to the complainant's details. Preventive measures can be taken after the repair of the damage is completed (Christudason, 2008).

Efficacy in Financial Management

The financial ability of the strata to remain stable is very important, it is the hope to ensure that property management can be carried out properly. The continuity of the financial management of a strata property depends on the source of collection of management fees from unit owners. Delays in charge invoice fees are charged, resulting in delays in revenue collection, this will be severe if the

unit owner also delays the payment of the collection to the JMB account. JMB will face cash flow problems and affect the ability to pay contractors on time (Wang et al., 2021; and Christudason, 2008). Efficiency in revenue collection management is important, billing the unit owner needs to be on time to give them space to plan the payments that will be made. Thus, billing needs to be done systematically and collection through online banking. Effective financial management needs to be able to track unpaid invoices and unit owner details.

A reminder notification notice needs to be issued immediately for the interests and rights of other unit owners who are obedient to pay. Feeling of dissatisfaction among unit owners if there is escapism against some unit owners who are stubborn in collecting JMB revenue. Payment non-compliance must be reported for the AGM's knowledge and act as a deterrent to ensure the same does not happen again. Property management is highly dependent on the cooperation and quality of maintenance or repair services provided by appointed contractors. Therefore, accurate procurement is important to ensure that the building service guarantee promised to the unit owner is adhered to. The procurement process must comply with the recommendations suggested by the KPKT Guidelines of Strata Procurement.

In addition to ensuring that the contractor can be appointed accurately and quickly, the issue of integrity regarding the procurement decision is also essential. Through a planned database for procurement, appointment of contractors and supply, the problem of delay in appointing contractors and the issue of transparency of the procurement process can be resolved (Christudason, 2008). The transmission of damage information from unit owner complaints made needs to be accurate and fast, to make it easier for the contractor to contact the unit owner and make repairs according to the appointment at the unit owner's convenience. The process verification of the quality of service provided by the contractor is important, whether it is done by the JMB property supervisor or the unit owner as to whether is satisfied with the damage complained of. Next, the allocation of a sinking fund for JMB's financial sustainability in the future is necessary. The issue is that the sinking fund is allocated in advance before other expenses are implemented or this provision is made by looking at the account balance after deducting expenses from the generation of JMB collection revenue. Therefore, it is not impossible that some strata properties have started renting shared facilities that are not used for income generation to JMB to ensure that costs can be accommodated, sinking funds can be allocated and property management fees are not increased, for the sake of JMB's financial sustainability.

Enforcement of Legal Action
The compound issued is only effective if the recipient complies with the instructions and the compound payment is imposed or if the law against the compound that is violated is followed. Legal action can only be taken based on

strong evidence that the property management regulations is not obeyed (Guilding, et. al., 2014; and Christudason, 2008). The long process of legal action causes the process of monitoring legal action events to be difficult. Therefore, automation from the aspect of monitoring legal actions taken is very necessary.

RESEARCH METHODOLGY
Research methodology was conducted through interviews with JMB committee members, accountants and auditors appointed by JMB and MC, property managers and unit owners. A total of 46 respondents have cooperated in identifying important parameters for the development of a framework of integrated property management system for sustainable affordable strata housing, for which the parameters identified from the prior literature review discussed above.

ANALYSIS AND DISCUSSION
Statistical analysis had been conducted, in which the reveal a list of parameters that impacted in strata property management as stated in the following Appendix 1. In term of professionalism and good governance practice, the professionalism & qualification of personnel in charge (P_1), disclosure of good governance practice (P_2), unit owner right and responsibility (P_3) and important & power of AGM (P_4) seem to be impacted in the strata property management. Feedback from the respondents stressed that the database on personnel in-charge supervising the building, the management representative of unit owner, the voting right system, the information about the financial statement should be disclosed before AGM meeting. As well as, the communication between unit owners regarding the complaints undertaken and other social activities organized by the JMB. This result seems to agree with prior literature that highlighted the good governance practice and policy is fundamental on strata property management (Wang et al., 2021; Ariff and Davies, 2009; Christudason, 2009; and and Christudason, 2008).

Meanwhile, in term of the transparency information of database management, detail information of unit owner or residents (tenants) (D_1), information of unit owner on financial management: charging invoice (D_2), information of unit owner on financial management: default payment (D_3), information of unit owner on financial management: legal action advice (D_4), information of unit owner on complaints management: complaint detail (D_5), and information of unit owner on complaints management: frequency & trend (D_6) had been identified impacted on the strata property management. For which the respondents emphasised on the update database of unit owner or residents in case of tenanted strata unit, information on how reachable the unit owners are and their dependents information. The ability of database to billing invoice and trace any default payment by the unit owner, as well as the database management function

to monitor and report the legal action advice undertaken by JMB. The genuineness of complaints management received from the unit owners or residents, while the frequency and trend of complaints lodged that are available for analysed as deterrence plan of action of damage complaints (Yap and Ng, 2017; Che-Ani et al., 2009; Christudason, 2008).

The property management practices, showed that elements of agreed service level (PM_1), planned maintenance monitoring (PM_2), planned maintenance frequency adjustment for cost saving (PM_3), complaints management monitoring (PM_4), complaints management communication (PM_5), corrective maintenance monitoring (PM_6), and analysis on planned & corrective maintenance (PM_7) have a significant influenced in strata property management. The feedback from respondents indicates that monitoring on the planned maintenance able to be analysed to lead for frequency adjustment for cost saving. Meanwhile, the complaints management indicated, unit owners or resident need to be communicated on the status of the complaints lodged. Besides, the corrective maintenance undertaken upon the complaints made need monitoring system and preventive measures in placed (Ebekozien, 2022; and Wang et al., 2021).

Meanwhile, the financial management aspect should be integrated with database management of unit owners detail and property management, such as invoice billing monitoring (FM_1), payment monitoring (FM_2), default payment monitoring (FM_3), procurement process (FM_4), validation of maintenance delivery (planned & corrective) (FM_5), provision of sinking fund (FM_6), reporting for AGM (FM_7), and analysis for sustainability of financial management aspect based on the database available (FM_8) are parameters that impacted the strata property management. Respondents feedback signified that the efficiency on invoice billing and collection monitoring is essential for the going concern of the strata management. Any default payment required immediate follow- up and communicated with the respective unit owners, to avoid prolonged unpaid fees. The transparent of procurement process took place, the provision of sinking fund and financial statement reporting for AGM seem are parameter as accordance to the good governance practice mentioned earlier, which supported prior study by Wang et al., (2021); and Christudason (2008). While verification mechanism on how the planned and corrective maintenance conducted is essential, as this information supplied proceed for strata expense disbursement to contractor.

In term of enforcement of legal action, such as basis evidence of legal charging (L_1) and monitoring of legal action undertaken (L_2), seem to be impacted the strata property management. Based on the database supplied from the financial management of the default fees collection, it assists the JMB to undertake a legal action and monitoring system on the legal status, which aligned with study by Guilding, et. al., 2014; and Christudason, 2008). From the analysis,

this study come out with the graphical conceptual of sustainable integrated property management that comprises the important parameters as the following. The is need for integration between the parameter, such the parameter of the reporting for AGM (FM_7), and analysis for sustainability of financial management aspect based on the database available (FM_8) are parameters which generated from the financial management module are key elements in the good governance management. The corrective maintenance monitoring (PM_6), in property management module is link to the verification of contractor work for authorization of expenses evidence under financial module, while the planned maintenance frequency adjustment for cost saving (PM_3), lead for the analysis on sustainability of financial management aspect based on the database available (FM_8), which is a financial management module as well as good governance management. The database management integration between parameter able to establish a conceptual model of a sustainable integrated property management for the affordable strata housing as depict in Figure 1 below which will be a feeder for the development of a prototype web-based application system of the sustainable integrated property management for the affordable strata housing in future.
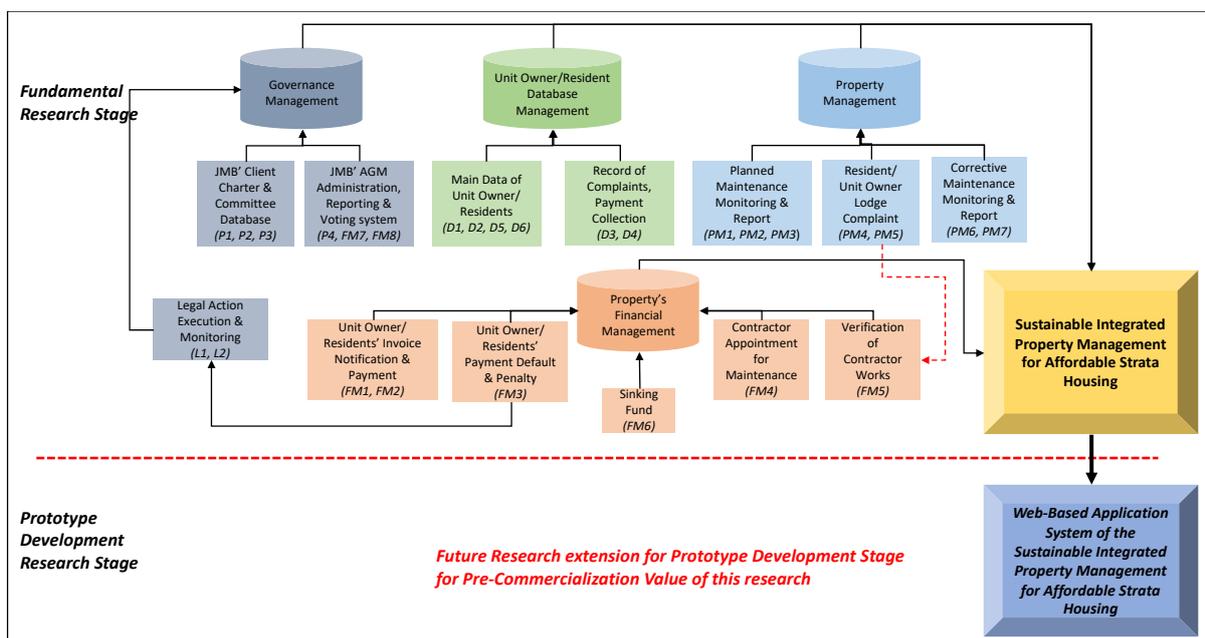
Figure 1: Conceptual model of a sustainable integrated property management for the affordable strata housing

SUMMARY

All in all, the outcome of the study aim highlights the integration between the sub-module of good governance management, main database of unit owners or residents, property management, financial management and legal action management as a whole strata property management aspect. The integration able to harmonize various aspects of the needs of strata residential in order to create a strata liveable life. The monetization of web-based application (apps) is subject to the business model as to whether charge according to the users or the JMB which requires further depth discussion on pre-commercialization of intellectual properties.

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Appendix 1: List of parameters impact on Strata Property Management

No.	Components
1	**Professionalism and Good Governance Practice**
1.1	Professionalism & Qualification of Personnel in charge (P1)
1.2	Disclosure of good governance practice (P2)
1.3	Unit owner right and responsibility (P3)
1.4	Important & Power of AGM (P4)
2	**Database Management's transparency of information**
2.1	Detail information of unit owner or residents (tenants) (D1)
2.2	Information of unit owner for financial management: Charging Invoice (D2)
2.3	Information of unit owner for financial management: Default payment (D3)
2.4	Information of unit owner for financial management: Legal Action Advice (D4)
2.5	Information of unit owner for complaints management: Complaint detail (D5)
2.6	Information of unit owner for complaints management: Frequency & Trend (D6)
3	**Property management practices and quality**
3.1	Property management: Agreed Service Level (PM1)
3.2	Property management: Planned Maintenance Monitoring (PM2)
3.3	Property management: Planned Maintenance Frequency Adjustment for cost saving (PM3)
3.4	Property management: Complaints Management Monitoring (PM4)
3.5	Property management: Complaints Management communication (PM5)

No.	Components
3.6	Property management: Corrective Maintenance Monitoring (PM6)
3.7	Property management: Analysis on plannned & corrective maintenance (PM7)
4	**Efficacy in Financial Management**
4.1	Financial management: Invoice billing monitoring (FM1)
4.2	Financial management: Payment monitoring (FM2)
4.3	Financial management: Default Payment monitoring (FM3)
4.4	Financial management: Procurement process (FM4)
4.5	Financial management: Validation of Maintenance Delivery (planned & corrective) (FM5)
4.6	Financial management: Provision of Singking Fund (FM6)
4.7	Financial management: Reporting for AGM (FM7)
4.8	Financial management: Analysis for sustainability of FM aspect (FM8)
5	**Enforcement of Legal Action**
5.1	Legal Action: Basis of Legal charging (L1)
5.2	Legal Action: Monitoring (L2)

HAS SECONDARY MORTGAGE MARKET PROMOTE HOUSE AFFORDABILITY? EVIDENCE FROM INDONESIA

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Abstract

The advantage of secondary mortgage market establishment to decrease housing cost, theoretically, had been mentioned frequently in domestic and international research. However, research on this matter in Indonesia is still limited to narrative descriptive. This research engages sequential explanatory design by utilizing empirical evidence from financial perspective to analyse the impact of securitization to the yield spread premium from monthly data ranging from June 2017-April 2021. In quantitative phase, this research found that either securitization volume or the launch of new series of asset backed securities (ABS) significantly affects mortgage rate, contrary to aggregate mortgage volume, prepayment risk, and yield curve risk. In the qualitative phase, it is explored that the reason of securitization's stagnation is market unreadiness.

Keyword: Housing, securitization, asset backed securities, mortgage, yield, Indonesia

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INTRODUCTION
The need of shelter was categorized by Maslow (1943) in his Hierarchy of Needs as physiological need, the most basic need. Yet, from the data of Central Bureau of Statistic (BPS) only 80,10% of families in Indonesia own a house in 2020. Studies by Rohman (2020), Christie & Ayem (2021), Pradana (2019), and Agatha & Priana (2020) were held to find the determinants of mortgage distribution. All the studies concluded that mortgage lenders' rate of return has significant negative impact to the mortgage distribution. Thus, the higher mortgage rates, the less mortgage will be channeled. The problem arise as Indonesia's mortgage rate is placed 25th from 108 observed countries, the highest in ASEAN (Numbeo, 2021). This finding matches the fact that Indonesia's mortgage to GDP ratio is the lowest in ASEAN.

The Government had set the function of housing and public facility one of the National Priorities. In 2021, this function's spending increased by 60,9% to Rp33.228,5 billion from 2020's outlook. Despite the multiplier effect it intends to enhance, spending is a burden to the Government's fiscal capacity. To bridge the need of affordable housing and Government's capacity, Lea & Chiquier (1999) underlined the role of secondary market in developing country.

RESEARCH BACKGROUND
Bank is considered most exposed to liquidity and interest rate risk. It has the potential of relative inefficiency, since saving institutions have higher cost ratio than capital market lenders. Besides, maturity mismatch tends to happen if long-term mortgages distributed are mainly funded by short-term deposits. To solve this problem, a new model that include the role of a special institution in the secondary market that helps mortgage lenders to control liquidity risk and interest rate risk by manages the role related to liquidity, rediscounting, or secondary mortgage facility (Lea & Chiquier, 1999).

Passmore et al (2002) found that this entity generally lowers mortgage rate. Later in 2005, Passmore et al found that this entity could lower mortgage cost by 7 basis points. Kolari et al (1998), Naranjo & Toevs (2002), and Sabry & Okongwu (2009) had studied the topic in the USA, whereas Harun & Othman (2007) did the research in Malaysia. Their studies prove that mortgage securitization can lower mortgage rates that result in more affordable housing.

Indonesia had started its secondary mortgage market construction in 2005 by the establishment of PT. Sarana Multigriya Finansial (PT SMF). PT SMF is the secondary mortgage company of Indonesia, similar as Fannie Mae (Federal National Mortgage Association and Freddie Mac (Federal Home Loan Mortgage Corporation) in the USA. Previous study on PT SMF was done by Prasetyowati (2013) and Harikusuma & Ubed (2020), but these studies are mostly narrative-descriptive and haven't provide empirical evidence of the company's impact.

Since the introduction, measurement to review the impact of secondary mortgage market to the affordability of housing should be done. Therefore, this research aims to examine the effects of securitization to the yield spread premium in the primary residential mortgage market in Indonesia. After the effect is measured, the reason behind the phenomenon will be explored.

REVIEW OF SELECTED LITERATURE

Previous studies in Indonesia had proven that mortgage rate is an important factor of housing affordability. The study conducted in sharia bank and conventional banks by Rohman (2020), as well as state banks by Djati (2017) and Amal (2015) agree that bank's rate of return has significant negative impact on mortgage distribution. Further, Novianti (2020) found that mortgage rate has significant negative impact on it as well.

Lea & Chiquier (1999) had mentioned the benefits of securitization, namely increase of fund availability to the mortgage lender and decrease of mortgage credit cost. It was done through more efficient risk allocation national diversification. Empirical studies conducted abroad had tried to prove the theory. Some of the studies and its content are listed in Table 1.

Table 1: Resume of Literature Review

No.	Research	Resume
1.	Jameson et al (1992)	Mortgage collateralization, credit risk, yield curve risk, and aggregate mortgage volume significantly affect yield spread premium in the USA. This study used multiple linear regression and t-test.
2.	Kolari et al (1998)	Implementing cointegration analysis, this study found that 10% of securitization increase trigger 20 basis points decrease of mortgage yield spread.
3.	Todd (2001)	Securitization has no significant impact to mortgage rate but lower the initial payment. Thus, increase savings.
4.	Naranjo & Toevs (2002)	In the increase of $1 billion securitization, yield spread will decrease by 8 basis points.
5.	Liu & Skully (2005)	Securitization significantly affect yield spread premium in Australia. This study used multiple linear regression and t-test.
6.	Harun & Othman (2007)	Study in Malaysia using cointegration analysis found that increase of 1% securitization affects yield spread premium to decrease by 0,8 basis points. But the effect is later neutralized by prepayment risk.
7.	Lehnert (2007)	Based on the vector autoregression (VAR) analysis securitization has very little effect to yield spread. Increase of $10 billion securitization affects yield spread to decrease by 0,5-0,6 basis points.

No.	Research	Resume
8.	Sabry & Okongwu (2009)	Securitization lower cost of credit and the increase of securitization has significant positive impact to the amount of mortgage credit per capita.
9.	Khasyanova & Samsonov (2020)	This study used propensity score matching in Russia and found that securitization don't benefit the originator a lower funding cost or profitability increase.

Source: Resumed by Author

In Indonesia, Prasetyowati (2013) described the definition and benefits of securitization with literature review. Literature review also used by Harikusuma & Ubed (2020) to underline PT SMF's role to provide funding to lend to mortgage lenders and to facilitate securitization. From juridical aspect, Doyoharjo (2008) had explained the concept, organization, and implementation of securitization in Indonesia. On the other hand, Ananto et al (2018) implementing normative juridical approach. Hence, we know that the research conducted in Indonesia has yet addressed empirical evidence of the benefit of securitization as secondary mortgage market's main activity to lower yield spread premium that promote more affordable housing.

METHODOLOGY
This research implements mixed method research with sequential explanatory design. Amaratunga et al (2002) stated that both quantitative and qualitative methods have weaknesses. Quantitative method tends to be inflexible and artificial. Besides, since the method focus on what is or what has been recently, it is hard for policymakers to infer what changes and actions should take place in the future. On the other hand, it is harder to control the pace, progress, and endpoints of research process of the qualitative method. Policymakers also tend to give low credibility to the result of qualitative method.

To tackle these weaknesses, this research engages the mixed method. Sugiyono (2019,40) stated that a more comprehensive, valid, reliable, and objective data could be derived from mixed method. Thus, it can improve the credibility of the result. Besides, Creswell & Creswell (2018) mentioned that mixed method provides more complete argument and stronger evidence. Since mixed method provide more comprehensive perspective (Creswell & Creswell, 2018), the inflexibility of quantitative method would be suppressed. As the result, policymakers would have a highly credible research result and able to infer what action should take place in the future.

Sequential explanatory design is chosen since the design match the aim of this research. This design collects data in sequential order. Quantitative data are first collected and analysed. In this research, this phase will provide the "what is", the effect of securitization to the yield spread premium. The result also informs what the types of participants to be purposely selected for the qualitative

phase and what question to be asked to them. This will then build the second analysis (QUAN→qual). The flow of sequential explanatory design derived from Creswell (2018) is shown in the following Figure 1.
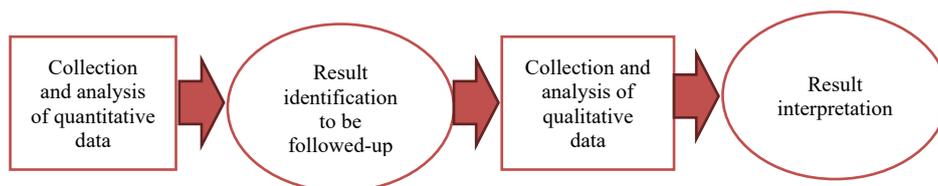
Figure 1: Research Flow
Source: Creswell & Creswell (2018)

1. Quantitative phase
The framework of the analysis and research model are below:
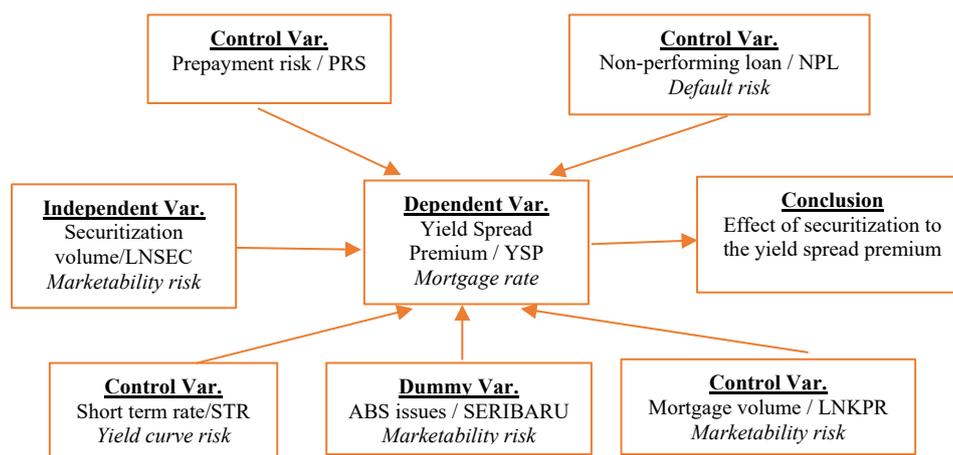
Figure 2: Analytical Framework
Source: by Author

The data used for quantitative phase are monthly time series data from June 2017-April 2021 period. Previous study such as Kolari et al (1998) and Harun & Othman (2007) use time series data as well. Other data are collected from document tracing, thus considered secondary data, from Otoritas Jasa Keuangan (OJK), Asset-Backed Security (ABS) Performance Report from PT SMF, Indonesia Bank Statistics, and Survei Perbankan from Bank Indonesia, as well as government securities yield history from trusted sites.

Microsoft Office Excel was utilized to collect and build worksheet. The data then cleaned and exported to STATA version 16 to be tested. The test

consisted of statistic descriptive, diagnostic test, regression, and goodness of fit test.

2. Qualitative phase

Qualitative phase is built after the result of quantitative phase is defined. Quantitative phase's result is the case study for qualitative phase in this research. Qualitative phase utilized deep interview with purposive sampling and literature review. Thematic analysis to the interview results then run to present final thematic scheme that portrayed the findings.

Although secondary mortgage market in Indonesia had been built since 2005 with the establishment of PT SMF, the first ABS as the product of mortgage securitization by PT SMF (SMF-BTN01 series) was first published just in December 2015. The recency of this security could result in the limited knowledgeable investor. Up until the end of this research's observation period, the originator of the securities is also limited to two state-owned banks. Considering that, policymaker is the group that hold the most information about secondary mortgage market dynamics.
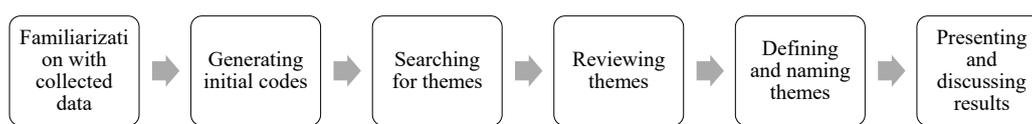
Figure 3: Thematic Analysis Phase
Source: Labra et al (2019)

Among the knowledgeable policymakers, this research had interviewed 4 staff of Directorate of Restricted State Asset. The interviewees are the members of KND IIC Section which directly involved in the supervision PT SMF as the Minister of Finance's representative in General Meeting of Shareholders. The experiences of the interviewees related to PT SMF's effectivity measurement, State Equity Participation (PMN) decision making, as well as the review of PT SMF's annual work plan would made them the most knowledgeable source for this research to unveil the phenomenon behind the effect of securitization on the yield spread premium. This matches Sekaran & Bougie (2016)'s requirements to choose the most appropriate and best positioned interviewees to obtain the best information needed. The interview results then undergo six thematic analysis phases as mentioned by Labra et al (2019) in Figure 3.

To process the data, Atlas.ti 9 application was used. Lastly, credibility, transferability, dependability, and confirmability of the result was checked.

EMPIRICAL RESULTS

1. Quantitative phase

In the quantitative phase, this research implemented statistic descriptive test, diagnostic tests to find measurement error, specification error, multicollinearity, autocorrelation, and non-normality, regression, and goodness of fit test. The regression model of this research after Prais-Winsten transformation is:

$$YSP_t = 46{,}99756 + 0{,}1635419\,LNSEC_t + 0{,}2929387\,PRS_t + 0{,}3806987\,NPL_t - 7{,}14166\,LNKPR_t - 0{,}4566454\,STR_t + e_t$$

where:

$$e_t = 0{,}4736153\,e_{t-1} + v_t$$

Coefficient of dummy variable SERIBARU was not added to the constant as the result of its *p-value* being 0,205, more than significance level of 5%. This means that H_0 that new issues of ABS don't significantly impact YSP couldn't be rejected. From the F-test and determination coefficient analysis, it is concluded that this model is a good fit and simultaneously explains 81,25% of YSP changes.

With significance level of 5%, the result of t-partial test that shows each independent variable impact to the YSP is shown in Table 2.

Table 2: Impacts of Independent and Control Variables to the Dependent Variable

Variable	P >	t		Condition	Impact to YSP
LNSEC	|0,654|	P > | t | more than 5%	Insignificant
PRS	|0,002|	P > | t | less than 5%	Significant
NPL	|0,227|	> | t | more than 5%	Insignificant
LNKPR	|0,000|	P > | t | less than 5%	Significant
STR	|0,000|	P > | t | less than 5%	Significant
SERIBARU	|0,205|	> | t | more than 5%	Insignificant

Source: Resumed by Author

As stated by Benoit (2011), in the linear model, β directly reflects the change of Y for every change of X (it reflects elasticity). Hence, it can be interpreted that:

a. For each percent of increase in prepayment risk (PRS), yield spread premium (YSP) wil increase by 0,29%.
b. For each percent of increase in short-term rate (STR), yield spread premium (YSP) will decrease by 0,46%.

Different from PRS and STR, LNKPR impact to YSP is in linear-log model. The literal interpretation of this model, as stated by Benoit (2020) is each

unit of change in logX will increase Y by β unit. Refers to Benoit (2011) and Ahmad (2020) the impact of LNKPR to YSP can be interpreted as:

a. YSP will decrease by 7,14% if outstanding mortgage nominal multiplied by basis value e (2,71828). This is referred as $\log X + 1 = \log X + \log e = \log(eX)$.
b. Each percent of increase in outstanding mortgage nominal will result in the decrease in YSP by 0,0714%. This is referred as $\Delta Y = \beta . log ([100 + p]/100)$ with p is percentage of increase in X. In small value of p Benoit (2011) stated that $log ([100 + p]/100) \approx p/100$. Hence, for every 1% increase in X, the impact on Y is $\beta/100$.

Unlike the previous research results of the significance of securitization impact to the yield spread premium such as Liu & Skully (2005) in Australia, Kolari et al (1998), and Naranjo & Toevs (2002) in the USA, this research found that securitization in Indonesia have no significant impact to yield spread premium. It indicates that the affordability of housing cost is not significantly impacted by the current securitization level. This finding is similar with Todd (2001), Lehnert (2007), and Harun & Othman (2007).

On the other hand, prepayment risk consistently significantly affects the yield spread premium. This finding strengthens the research by Jameson et al (1992) which stated that prepayment risk has significant effect at 10% significance level. Meanwhile, Kolari et al (1998) stated that prepayment risk has a cointegration nature in the long term with yield spread premium. Harun & Othman (2007) said the same thing. These results prove that mortgage lenders pay close attention to the risk of early repayment from debtors. This risk is also used as an indicator of the risk assessment of mortgage distribution.

Non-performing loan (NPL) has no significant effect to the yield spread premium. This finding corroborates the findings of Kolari et al (1998). The insignificance of NPL occurred because banks have carefully assessed debtors' eligibility of mortgage. Government through Central Bank (Bank Indonesia/BI) and Financial Service Authority (Otoritas Jasa Keuangan/OJK) also actively implements policies to keep the NPL level.

Interest rate of short-term government bonds has significant effect to the yield spread premium. This variable was utilized to capture the effect of yield curve risk. The significance of this variable indicates that the bank has considered the effect of short-term interest rate volatility/changes in the price of financial instruments. Yield curve risk also stated to be a part of interest rate risk which must be managed according to Article 4 paragraph (1) letter b of OJK Regulation No. 18/POJK.03/2016.

Increase in short-term investment interest rates that is faster than the increase in long-term interest rates could make the risk gap between short-term and long-term investments smaller. Therefore, mortgage lenders wouldn't expect

a higher rate of return as risk compensation from long-term investments such as mortgages. Thus, mortgage interest rates decrease as research results show a significant negative effect of STR on YSP.

2. Result Identification

Other proxy of marketability risk than securitization, namely volume of mortgages, has significant negative effect to the yield spread premium. In fact, the effect is the largest compared to other variables with the coefficient of -7.14166. In the other words, the increasing volume of outstanding mortgages can reduce mortgage interest rates. Thus, it can be concluded that marketability risk is an indicator to determine the expected return on mortgage distribution.

The insignificant effect of securitization to the yield spread premium indicates that volume of securitized mortgages is not the proxy of marketability risk considered by mortgage lenders to determine the expected return. The insignificant effect of dummy variable SERIBARU to the yield spread premium strengthens the indication. From this phenomenon, a common thread can be drawn that the current mortgage securitization activity has not been able to achieve its objectives according to Article 2 of Presidential Regulation No. 19 of 2005, which is to create sustainable housing finance that is affordable for the public. Therefore, the reason behind it needs to be identified to identify the right actions to optimize the role of securitization in the affordability of house prices.

3. Qualitative phase

In the qualitative phase, thematic analysis was performed. At the beginning of the analysis, 56 initial codes were generated. The process then followed by axial coding and categorization to define the themes.

Preliminary research in quantitative phase found that the effect of securitization was not significant to the mortgage rate. Interviewee KA agreed that securitization activity is not yet optimized. Member of the OJK Board of Commissioners, Hoesen, in Haryono (2021) said that the development of securitization instruments in the domestic financial market is still limited. The reasons addressed are as follows:

a. Market unreadiness
PT SMF mentioned the main condition to build a secondary mortgage market is the existence of a strong primary mortgage market. There are four aspects that are required to build a secondary mortgage market; originators who are willing to sell their mortgage collection rights, investors who are willing to buy mortgage securitization products, regulations that support efficient transactions, and a sufficient volume of high-quality mortgage so that transactions are sustainable.

a.1 Interest of ABS investor

Haryono (2021) stated that investors are not familiarized yet with ABS. Interviewee KA also address that this instrument is not as liquid as other instrument such as sovereign bond. Research from Tenaga Pengkaji Restrukturisasi, Privatisasi, dan Efektivitas Kekayaan Negara Dipisahkan/TPRPEKND (2021) stated that 45.96% of the outstanding value of Class A ABS is held/bought by PT SMF itself. This worth IDR 1.72 trillion from outstanding value of IDR 3.74 trillion. As stated by Interviewee PL3, PT SMF did the role of standby buyer to stimulate the market.

PT SMF had issued EBA Ritel (Retail ABS) and plan to publish EBA Syariah (Sharia ABS) as product diversification. To support the diversification, interviewee PL3 underlined that ABS should have an easy-to-access and simple purchase channel. By now, ABS transaction channel is still limited to BNI Sekuritas, different from sovereign bond that has more partners and easier transaction method. This could lead to less informed market and less familiarized ABS.

a.2 Interest of mortgage lenders/originators

Interviewees PL2 and KA address that the originators still prefer other liquidity source than to secure its mortgage. The first reason is securitization has higher funding cost than other financing source. Astuti (2011) found that interest expense from third party funds (DPK) in the form of demand deposits is 3.04%, 3.41% for IPO, 10.25% for bond issuance, and 9.25% for securitization. The use of short-term deposit to finance long-term investment exposes the mortgage lenders to the greater risk of maturity mismatch.

The term of "true sale" transactions of mortgage in securitization also raises doubts for the prospective originator. "True sale" transaction results in the transfer of mortgage from the originator's book to the issuer's book. This decreases the amount of originator's asset. Director of PT. BTN, Iman Nugroho Soeko (in Primadhyta, 2017) said that banks with single-digit credit growth tend to reject securitization. The decrease in assets is feared to be unfavorable for banks' investors. This has become an obstacle to lure potential originators. In the observation period, only 2 originators securitized their mortgage, namely PT Bank Tabungan Negara (Persero) Tbk and PT Bank Mandiri (Persero) Tbk. in 7 series of ABS.

From the explanation above, there is an indication that the prospective originators don't have complete understanding on the benefit of securitization. Santoso et al (2014) also found that the understanding of prospective originators is still inadequate. In this matter, PT SMF should intensify its effort to promote and increase the originators' knowledge on mortgage securitization benefit.

Another way to overcome the reluctance of prospective originators to securitize their assets due to asset transfer is the covered bond. Interviewees

stated that PT SMF does plan to develop covered bond in 2021-2022. Securitization products are allowed to be published in the form of debt securities or participation letters. Thus, covered bond as securitization product aside from ABS are considerable.

Gambro et al (2009) stated that there are some significant differences between covered bonds and ABS in United States. First, there is no transfer of asset from the originator to the publisher's book. Besides that, the mortgages could be replaced if it's not performing.

a.3 Standardized mortgage

PT SMF has strict standards regarding mortgage receivables that can be securitized. General requirements of the mortgage are stated in OJK Regulation No. 11/POJK.03/2019. These conditions include generating cash flow, being owned and under the control of the Originator, and being transferable to the Issuer. In addition, PT SMF also has 32 special selection criteria to maintain the quality of mortgages that can be securitized.

The increase in the value of outstanding mortgages will increase the potential for quality mortgages. Therefore, PT SMF provide loan facility as an effort to increase the volume of high-quality mortgages. However, the increase in the loan facility disbursement and mortgage volume are not in line with the increase in the volume of securitization, as stated by interviewee KA.

Different from Indonesia that only has one set of selection criteria of mortgage to be securitized, USA has different criteria for different mortgage characteristics. According to Weiss & Jones (2017), conventional mortgages in the USA can be divided into conforming and nonconforming categories. Conforming means "suitable"; with criteria of mortgage that can be securitized by Fannie Mae and Freddie Mac. This criterion is usually a certain credit score. These suitable mortgages will be directed to Fannie Mae and Freddie Mac.

If non-conforming mortgages value is above the limit of securitization by Fannie Mae and Freddie Mac, the mortgage will be categorized as a jumbo loan and directed to be securitized with insurance from the Government through Ginnie Mae. Finally, for mortgages that originated from debtors with high risk, securitization can be accommodated in other private ABS issuers. This helps the absorption of mortgages into secondary market activities in the form of securitization. Although the criteria applied by PT SMF is a form of prudentialism, implementation of securitization in the USA is still important to be taken note of to expand securitization potential.

a.4 Supporting regulation

In addition to the core regulations such as Presidential Regulation No. 19 of 2005 and its amendments or Government Regulation No. 5 of 2005 and its amendments, technical regulations related to transactions are also required. From

the banking side, OJK Regulation No. 11/POJK.03/2019 and OJK Regulation No. 23/POJK.04/2014 was issued.

Regulation that brings significant changes to PT SMF is the issuance of Presidential Regulation Number 100 of 2020 and Government Regulation Number 57 of 2020. With this regulation, PT SMF's mandate is expanded. PT SMF can now also expand into project financing, collateralized loans, paripassu loans, warehousing, investments, etc. The expansion of this mandate gives PT SMF better flexibility in carrying out its activities. Interviewee PL2 stated that this mandate expansion will be monitored and supervised continuously so that the benefit to the housing sector is still vivid.

However, problem arises as the flexibility still can't be utilized completely because the revision of previous OJK Regulation regarding Secondary Mortgage Facility is yet published. This make the previously mentioned activities are not officially mandated yet, as stated by Interviewees. One of the activities postponed by for this matter is the distribution of construction loans (Heliantopo in Rahma, 2021). Thus, regulations that support PT SMF's flexibility and mandates should be published immediately.

b. Different condition of benchmark countries

Indonesia's secondary mortgage market is with those of benchmark countries such as the USA and Malaysia. This can be seen from the form of secondary mortgage company in the countries. PT SMF in Indonesia is a state-owned company. 100% of its shares is owned by the Government. This is different from secondary mortgage facilities in United States, Fannie Mae and Freddie Mac, which, although sponsored by the government, are wholly private-owned (Weiss & Jones, 2017).

Different condition happens with Cagamas, secondary mortgage company of Malaysia. 20% of Cagamas shares are owned by the Malaysia Central Bank (Bank Negara Malaysia) and the rest is owned by commercial and investment banks. Interestingly, the role of the central bank in mortgage facility was also proposed by Lea & Pollock (1996) during a joint study with the Financial and Monetary Analysis Agency (Badan Kebijakan Fiskal/BKF) to obtain the concept of the first secondary mortgage facility in Indonesia.

c. Urgency of PT SMF's effectivity and health measurement standard

Lastly, PT SMF's effectivity and health measurement standard is urgent to be set. The Ministry of State-Owned Enterprise/SOE (Badan Usaha Milik Negara/BUMN) has two regulations related to the assessment of the health level of SOEs. The first regulation is the Decree of the Minister of SOEs No. KEP-100/MBU/2002 that regulate non-financial service SOEs and financial service SOEs, except for SOEs which are formed by separate laws. SOE Minister

Regulation No. PER-10/MBU/2014 then provides more specific regulations, but still excludes PT SMF.

In 2018, OJK released the criteria for the health level of PT SMF as a secondary mortgage facility in OJK Regulation No. 4/POJK.05/2018. Its elements include liquidity ratios, capital ratios, asset quality, and allowance for possible losses on assets and allowance for impairment losses. Although the elements are provided, the details of the amount have not yet been determined in this OJK Regulation and will be determined later. But, in the observation period, the later regulation was not published yet.

The unstandardized measurement tools result in the different conclusion in the company's health and effectivity. Asymmetric information between the management, investor, policymaker, and originator creates difficulty to make a relevant decision. Thus, measurement tools for PT SMF should be standardized and the OJK Regulation on it should be published.

CONCLUSION AND REMARKS

The construction of the secondary mortgage market in Indonesia began when a secondary mortgage company, PT SMF, was established in 2005. This research was conducted to provide empirical evidence of the effects of mortgage securitization activities facilitated by PT SMF in Indonesia to the yield spread premium. Then, further analysis of the causes of the effects were conducted.

This research engages explanatory sequential design of mixed method. The quantitative phase aims to examine the effect of the securitization and issuance of Asset Backed Securities (ABS) to the yield spread premium. The result found that mortgage securitization as well as ABS issuance in Indonesia has not been able to influence or reduce yield spread premium. Thus, it can yet promote housing affordability.

This finding is different from the results of previous studies by Jameson et al (1992), Kolari et al (1998), Naranjo & Toevs (2002), Passmore et al (2005), Liu & Skully (2005), and Sabry & Okungwu (2009) in the United States which proved the benefits of the secondary mortgage market to reduce mortgage interest rates. Therefore, this study conducted a further analysis to find the cause of securitization stagnation in Indonesia by performing qualitative phase with interview and literature review.

The first cause is market unpreparedness which is marked by the lack of public interest in ABS investment, lack of interest of banks/mortgage lenders to perform securitization, lack of supply of high-quality mortgages that are followed up with securitization, and technical regulations that have not been issued. The differences between the secondary housing finance market conditions in the benchmark countries and in Indonesia also create several limitations. Last, the absent of the standard of health level and effectivity measurement of PT SMF

also potentially prevents fact-based decision making by the policymakers. Some of the action that can be done by PT SMF regarding the results are:

1. Determine the target market for ABS according to the characteristics of each age group. For example, Retail ABS are more suitable for retail investors <30 years old because the population makes up >50% of capital market investors but the asset value is small so Retail EBAs can gain collective benefits. For this reason, the promotion method can also be adapted to the character of people aged <30 years, for example by using social media.
2. To facilitate access to ABS purchases, PT SMF can collaborate with more EBA distribution partners from financial technology (fintech) companies or e-commerce sites that have advantages in terms of service features and ease of transactions.
3. Covered bonds should be developed seriously to answer the main doubts of original creditors, the transfer of credit assets.
4. Comparative studies can be carried out between Indonesia and benchmark countries such as the United States and Malaysia to find the best model for companies in the secondary housing finance sector and their activities.

A specific set of indicators should be made regarding the level of effectiveness and health of company in the secondary mortgage sector. Unique key indicators that can accurately describe the effectiveness and health of the company based on its unique characteristics are important to provide more objective decision.

For further researchers, this research was conducted with limited time, cost, manpower and mobility, so it cannot avoid shortcomings. Further researchers can use time series analysis techniques with a longer observation period. Thus, the horizon of the research results will be wider and the relationship between securitization and mortgage interest rates can be identified from a short-term and long-term perspective. In addition, further researchers can use other research methods to enrich the point of view or add sources in the interview. Operational definitions of variables in further research can also be modified if to get a truly objective relationship between variables.

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APPENDIX A: FINDING THE PROXIES

Previous research used various proxies to convey the meaning of the variables. List of variables, its proxies, and the references that are used in this research shown in Table A.

Table A: Variable Description and References

Variable	Description	References
YSP	Yield spread of conventional banks' average mortgage rate and government's securities with 20 years maturity	Harun & Othman (2007)
LNSEC	Natural log of securitized outstanding mortgage nominal (in trillion Rupiahs)	Jameson et al (1992), Kolari et al (1998), Naranjo & Toevs (2002), Harun & Othman (2007), Sabry & Okongwu (2009)
PRS	Yield spread of government's securities with 1 month maturity and government's securities with 10 years maturity	Kolari et al (1998), Naranjo & Toevs (2002), Harun & Othman (2007), Sabry & Okongwu (2009)
NPL	Nominal of non-performing loan divided by outstanding mortgage nominal (in trillion Rupiahs)	Naranjo & Toevs (2002)
LNKPR	Natural log of channelled mortgage in the observed month	Jameson et al (1992), Kolari et al (1998), Naranjo & Toevs (2002), Harun & Othman (2007), Sabry & Okongwu (2009)
STR	1Y government's security yield.	Jameson (1992)
SERIBARU	New issue of ABS (dummy)	Jameson (1992)

Source: Resumed by Author

APPENDIX B: PRAIS WINSTEN ESTIMATOR
At the initial of the research process, this research implemented regular linear regression. But the result showed that there was autocorrelation in the model. This research used Durbin-Watson test for autocorrelation. Table B shows the limits of Durbin-Watson value limits for model with 47 observation and 6 independent variables (without intercept) with 95% degree of freedom.

Table B: Durbin-Watson value limits

dL	dU	4-dL	4-dU
1,2605	1,8290	2,7395	2,171

Source: Resumed by Author

To be declared free from autocorrelation, the model's value (d) should be (1,8290 < d < 2,171). It turned out that d is 1,23876 with linear regression that indicates positive autocorrelation.

Payu (2016) mentioned that OLS autocorrelation results in the non-minimum variance even though the model is still linear and unbiased. This could fail the Gauss Markov assumption. To fix that, it is needed to estimate the correlation coefficient with Feasible Generalized Least Square / FGLS technique (Payu, 2016). This kind of model with more than 30 observations was mentioned by Payu (2016) to have more minimum mean square error with FGLS implementation than OLS. Specifically, FGLS with Cochrane-Orcutt is preferred for >30 observations model.

Regression equation with AR(1) error / first order serial correlation assumption as mentioned by Hill et al (2011) et al is:

$$y_t = \beta_1 + \beta_2 x_t + e_t \text{ where } e_t = \rho e_{t-1} + v_t$$

The equation can be reformed to:

$$y_t - \rho y_{t-1} = \beta_1(1-\rho) + \beta_2(x_1 - \rho x_{t-1}) + v_t$$
$$y_t - \beta_1 - \beta_2 x_t = \rho(y_{t-1} - \beta_1 - \beta_2 x_{t-1}) + v_t$$

To get the ρ (rho/correlation coefficient), β_1, and β_2, values iteration procedure of Cochrane-Orcutt is performed. After ρ is defined, the transformation then implemented until the autocorrelation is fixed. Jameson (1992), too, performed Cochrane-Orcutt to transform the data.

The use of Cochrane-Orcutt decreases the observation value to (n-1). Hill (2011) stated that researcher could ignore this and proceed. This is not a big problem with a model with many observations. But, if the researcher wanted to maintain the observation number, the researcher could create transformation error (e) that has the same value with non-autocorrelated error (v). With error variance

equation $\sigma_e^2 = \sigma_v^2/(1 - \rho^2)$, transformation is needed to make $\sigma_t = \sigma_v$. Thus, multiplication with $\sqrt{1 - \rho^2}$ is performed. This Cochrane-Orcutt development is called Prais-Winsten estimator. Prais-Winsten estimator equation is below.

$$\sqrt{1 - \rho^2}y_1 = \sqrt{1 - \rho^2}\beta_1 + \sqrt{1 - \rho^2}\beta_2 + \sqrt{1 - \rho^2}e_1$$

This research performed FGLS technique with Prais-Winsten estimator. Based on the iteration performed, estimated ρ is 0,4736. This transformation changes d value of the model to 2,089722. (1,8290 < d < 2,171). Thus, autocorrelation problem is fixed.

COMMERCIAL REAL ESTATE PRICES IN MALAYSIA AND COVID-19

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Abstract

The consequences of the coronavirus disease 2019 (COVID-19) pandemic on commercial real estate pricing are examined in this article, with a focus on the Malaysian market. It begins by pointing out certain cautions to keep in mind while using direct real estate indices. The authors then look at how commercial real estate prices changed during the epidemic, highlighting disparities between property kinds. This study uses data from both direct and listed real estate to achieve this goal and goes on to explore changes in the primary elements driving commercial real estate pricing. The essay then moves on to the expected future trajectory of commercial real estate values. Retail and hospitality assets, as well as, to a lesser extent, office buildings, were shown to be the most affected by the findings.

Keywords: Commercial, Real Estate, Price, Covid-19, Malaysia

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INTRODUCTION

The COVID-19 crisis has had an enormous impact on the commercial real estate market. As containment measures enacted in reaction to the pandemic negatively affected economic activity and decreased demand for commercial property, commercial property transaction volumes and prices fell internationally in the second quarter of 2020. The commercial real estate market in Malaysia quickly recovered from the initial shock, but long-standing social limitations continued to impede occupier demand in various economies and led to an expanding disparity in commercial real estate pricing between areas and commercial real estate segments (such as retail, office buildings and industrial).

Beyond the immediate effects, the pandemic has made several market segments' that are already in an unfavourable structural trend worse. This is especially true for the retail industry, where traditional shopping methods are in high demand. A desirable asset type for institutional investors is commercial real estate. It provides predictable income returns, its returns are inversely connected with the returns on financial assets, and empirical data also supports the effectiveness of the investment in mitigating inflation (Falkenbach and Hoesli, 2017). In light of this, numerous studies have demonstrated the advantages of including real estate in mixed-asset portfolios (Hoesli et al., 2004; MacKinnon and Al Zaman, 2009; Delfim and Hoesli, 2019).

Some of the key variables affecting commercial real estate pricing have been impacted by the coronavirus disease 2019 (COVID-19) pandemic. Significant damage has been done to rental streams. For instance, the World Tourism Barometer reports that during the first half of 2020, foreign visitor arrivals decreased by 65% (UNWTO, 2020). The combination of this plus a steep fall in business travel has resulted in significantly lower hotel occupancy rates and frequent hotel closures. The epidemic has also had a significant impact on retail earnings. Online commerce, which was already expanding quickly even before the epidemic, saw a significant boost when lockdowns made it difficult to shop in-store in many regions. The success of this type of work organisation has been demonstrated by the work from home policies that have been introduced in many areas, raising concerns about the need for office space going forward and, consequently, rental rates. Risk premiums are likely to have risen and growth expectations to have decreased as a result of the uncertainties surrounding cash flows.

It is difficult to gauge how COVID-19 will affect the real estate markets. Data on pandemics is scarce because they are exogenous and uncommon, and this is especially true given how rarely real estate time series occur. Furthermore, because prices can be considerably impacted by more general macroeconomic variables that are time- and place-bound, it is challenging to isolate the impact on the market. Nevertheless, between March 2020 and mid-October 2020, more than 50 scientific papers surfaced that specifically address

this issue. The other half of these research is still in the working paper stage, despite the fact that more than half of them have already been published in multidisciplinary or field-specific peer-reviewed journals.

LITERATURE REVIEW

Hotel and retail properties are two commercial real estate segments that were directly impacted by the shutdown and are currently experiencing the highest level of uncertainty. These structures house businesses that were forced to shut down completely because they primarily offered in-person services and/or had independent points of sale. Office structures and areas for business meetings are still empty. However, because they work in fields where there is less demand for physical interaction, the companies that occupy these premises are frequently nonetheless able to supply their services from their employees' homes (such as financial or professional services firms). However, because of the low demand, enterprises at industrial production sites continue to run in the majority of the world's economies, but with more safety precautions and at reduced capacity. Higher vacancy rates in the commercial real estate industry are anticipated as a result of these unfavourable events.

These low growth forecasts, coupled with a higher level of uncertainty, cause high net worth individuals, private equity funds, private as well as public real estate investment trusts, or developers' commercial property portfolios to lose value. As a result, these significant losses are accompanied by increased leverage ratios and risk premium needs for upcoming projects. It is getting more difficult for commercial investors to obtain money on the lending market as a result of falling property values. Additionally, the stock values of publicly traded real estate corporations fall, further drying up the funding market. Particularly during the COVID-19 epidemic, stock values are lower for companies, especially real estate securities, with less cash on hand, more debt, and limited earnings before 2020. (Ding et al. 2020).

The early effects of the pandemic on commercial real estate prices have been examined in a number of studies. As a result, it is difficult to extend the findings to estimate the long-term impacts of COVID-19 on real estate prices. The relationship between US Real Estate Investment Trust (REIT) returns and a geographically weighted exposure of their underlying assets to COVID-19 growth is examined by Ling et al. (2020). They state that returns to such exposure have had a deleterious impact. Among all sectors, businesses specialising in retail and residential real estate react more negatively, whereas the exposure to COVID-19 growth is positively connected with the healthcare and technology sectors. According to Xie and Milcheva (2020), being close to COVID-19 cases has a negative impact on the profits of Hong Kong real estate enterprises. Additionally, markets believe that commercial structures pose a greater risk than residential ones. According to Milcheva (2021), the COVID-19 effect is linked

to a sharp fall in the returns on international real estate securities as well as an increase in risk. Healthcare has the lowest sensitivity to COVID-19, whereas retail is determined to have the highest sensitivity. Finally, van Dijk et al. (2020) extrapolate future pricing changes on direct markets based on liquidity impacts at the start of the pandemic. With price drops between 14 and 19 percent, they forecast that the retail sector will be the most severely affected. Price decreases of between 10% and 15% are anticipated for the industrial sector, which is expected to be marginally more resilient.

Duca et al. (2021) concentrate on COVID-19's effects on housing markets. They note differences in how home values have changed between nations, with areas with a high reliance on tourism reporting dropping house prices while those in other countries have generally seen prices rise. They contend that the low interest rate environment, the relative lack of impact of the pandemic on the higher income people, as well as behavioural variables are to blame for the lack of a negative influence on house values. The latter concern perceptions regarding the length of the economic crisis brought on by the pandemic and its chances of recovery, the notion that housing is an excellent long-term investment, and decreases in the quantity of assets up for sale as a result of loss aversion behaviour.

REAL ESTATE PRICE AND IMPACT FROM PANDEMIC

Although there were numerous disturbing reports about COVID-19 coming out of China in January 2020, most people in Europe and the US only began to realise that the sickness was likely to spread to those places in February. There were numerous verified instances in several European nations by the second half of February. The World Health Organization classified the crisis as a pandemic on March 11. Due to these developments, many nations now impose limits on the free movement of people both within and between their borders. Some nations enacted stringent lockdowns, with France and Italy serving as two notable instances. Many different sorts of properties, especially those in the retail and hospitality industries, experienced an immediate impact on their income generation. Rent arrears increased along with the trend toward online retailing, which had already begun several years earlier, since in-store sales were frequently abruptly terminated and much of the retailing activity transferred to the internet. Logistics properties profited from the rise in demand from e-commerce businesses looking for hubs to ship goods to customers. The lack of completed and under construction properties in prime areas worsened the influence on prices. Both leisure and business travel were considerably impacted, which had an impact on hotels and resulted in low occupancy rates or hotel closures. Additionally, risk premia were probably impacted, as they were at the start of the world financial crisis (Duca and Ling, 2020).

Overvaluation of commercial real estate prices may indicate downward pressure on commercial real estate values, particularly if structural movements toward teleworking and e-commerce continue to pick up speed. It is extremely difficult to predict with any degree of accuracy how changes in company policy and consumer preferences will affect the valuation of commercial real estate because the economic recovery is so uneven across and within numerous economies. Recognizing these challenges, we make an effort to do a scenario analysis to analyse how a change in commercial real estate demand may affect fair prices. To achieve this, the model is expanded to include vacancy rates for a smaller set of economies for which statistics are available. Subsequently, to simulate a persistent shock to the demand for commercial real estate-specific goods and services, we shock the model using a sustained rise in vacancy rates. We then assess the impact on fair value of commercial real estate. While the magnitude of the effect varies between economies, a 5%-point permanent increase in the vacancy rate would cause a median decline in fair values of around 15% after five years.

COMMERCIAL PROPERTY PRICE IN MALAYSIA
Commercial property price in Malaysia has seen tremendous growth during the pre-COVID 19 pandemic. Although residential property still dominated the property market in terms of number of properties over the period of 2017 to 2020. Commercial property has seen consistent upward trend except during the high peak of COVID-19 cases. This has made the commercial property in Malaysia to become more significant within the property sector.
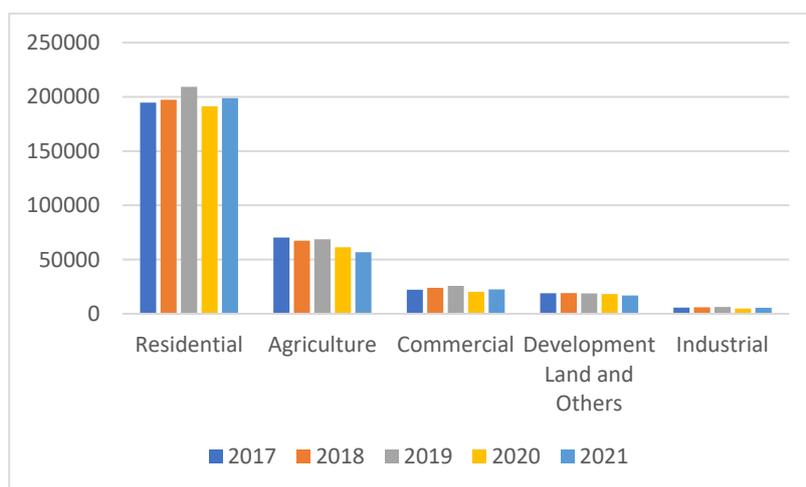
Figure 1: Number of Properties Across Property Sector in Malaysia
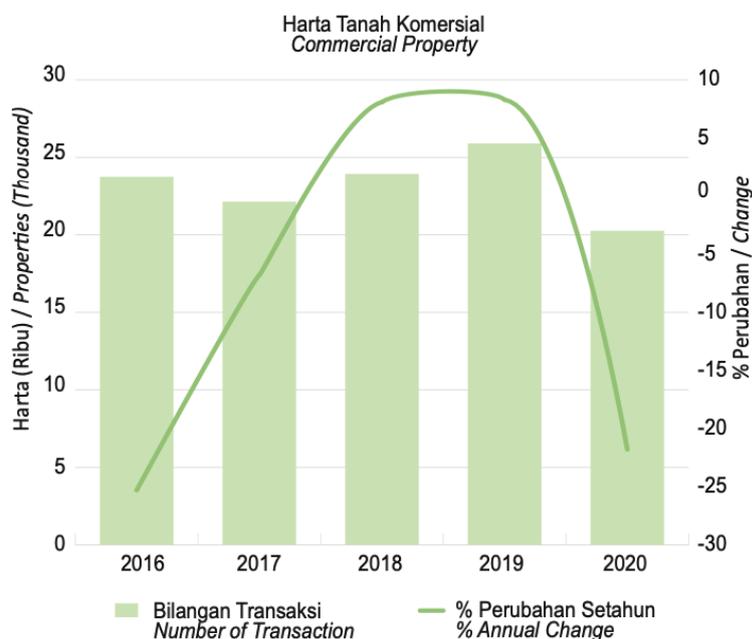
Figure 2: Number of Transaction and Annual Change of Commercial
Property in Malaysia

COVID 19 IMPACT TO THE ECONOMY

The effects of COVID-19 on the overall economy have been extensively studied in the literature. For instance, Baker et al. (2020) report that the COVID-19 pandemic has had a more severe negative impact on the stock market and the economy than past pandemics. According to Ozili and Arun (2020), the rise in lockdowns and travel restrictions have both led to a decline in economic activity. According to research by Gerding et al. (2020), stock returns during the COVID-19 pandemic reacted more negatively in nations with larger debt-to-GDP ratios, indicating that a nation's fiscal capacity is a crucial factor in reducing the pandemic effect. The COVID-19 pandemic has had a significant impact on company liquidity globally, as demonstrated by De Vito and Gomez (2020), who predicted in their model that 10% of enterprises would become illiquid within six months of the pandemic's commencement. Alfaro et al. (2020) demonstrate unexpected changes in predicted infections in aggregate as well as firm-level stock returns at the firm level. Schoenfeld (2020) discovers that the majority of businesses saw a decline in value at the start of the pandemic, despite the fact that firm managers consistently overestimate their firms' exposure to the disease.

According to Chen et al. (2020), after lockdown notifications, returns for companies with headquarters in U.S. states are lower, but different, when the county has a significant number of infections.

It should come as no surprise that the COVID-19 pandemic has a significant negative influence on the global real estate market given how much it has already had on the stock market and the economy. By examining market liquidity in eight significant U.S. markets, Van Dijk et al. (2020) in a special report from the MIT Center for Real Estate quantify the pandemic's effect on the private commercial property market. The report shows that since the start of the epidemic, liquidity has significantly decreased across all markets. The report also demonstrates that the recent decline in market liquidity is the largest decline since the Global Financial Crisis (GFC), and that the decline in the first four months of 2020 alone is already a sizable portion of the whole decline in market liquidity throughout the entire GFC. The first evidence of home price fluctuations for the U.S. residential real estate market is presented by D'Lima et al. (2020) and Zhao (2020). According to Zhao (2020), the COVID-19 has little effect on the home market in the United States because median residential house price growth rates fell in March and April but swiftly recovered after April. D'Lima et al. (2020) give a preliminary analysis of the impact of the COVID-19 pandemic shutdown reactions, but found no evidence of an impact on overall pricing. Using a detailed sample of firms' individual commercial property holdings in the U.S., Ling et al. (2020) develop a novel measure of listed commercial real estate (CRE) portfolios' exposure to the growth in COVID-19 cases. The same study then documents a negative relationship between COVID-19 case growth and real estate firms' risk-adjusted returns, that also demonstrates how the impact of the COVID-19 epidemic on real estate enterprises varies according on the type of property, with the technology sector responding favourably and the retail and hospitality sectors unfavourably. The majority of REITs have had value declines because to the pandemic, according to Akinsomi (2020), although other REITs, including as data REITs, grocery-anchored REITs, and storage REITs, have been less negatively impacted. The co-movement of real estate stocks and the whole stock market is examined by Milcheva (2020). According to the study, these correlations grow significantly during pandemics and there are significant disparities across different real estate sectors, with the retail sector showing the greatest susceptibility. When Xie and Milcheva (2020) look at how closeness to COVID-19 cases affects real estate business returns, they discover that the COVID-19 pandemic has a very unfavourable impact.

In 2019, Malaysia's financial development slowed to 4.3%, the lowest level since 2016 and lower than the previous record-low growth rate of 5.4% set in 2010. The lowest financial growth in ten years was 3.6% in the fourth quarter of 2019. The central bank, Bank Negara Malaysia, stated that the COVID-19 will have a negative effect on Malaysia's financial development. Only few studies

have explored the impact of pandemic to property market. These including Razali et al (2021) and Lee et al (2000). The impact of COVID-19 also give significant impact to the Malaysian real estate market. Research done by Razali et al (2021) have alarmed the government and all Malaysian property stakeholders on the performance of the country's listed real estate companies over the previous few decades that the impact of epidemics on property profile investments requires caution. The threat from breakouts appears to need to be taken into account in the government's financial strategic planning in the 21st century, while previously the contingency was only built up for financial crises. Malaysian private participants, particularly institutional investors, must be aware of and prepared for the challenge posed by outbreaks. Another study done by Lee et al. (2000) investigates the performance of Malaysian listed stock market. The study revealed number of COVID-19 cases significantly affected the performance of almost all sectors in Malaysian stock market. The growth of Malaysian real estate has been impeded by the COVID-19 pandemic. First, new operational and policy concerns regarding the supervision of construction workers were made clear by the coronavirus outbreak. Second, there are concerns about the building sites' current business model following the COVID-19 pandemic. Third, given that worker infection is no longer acceptable, how does a high COVID-19 transmission and infection rate affect the site? Even in the post-Coronavirus era, according to Megahed and Ghoneim (2020), there is still uncertainty over global best practises for real estate construction. Consequently, it might take years to contain the COVID-19 epidemic. Due of the COVID-19 pandemic, Malaysia has implemented many entry and mobility restrictions. Due to these limitations, project operations now face greater uncertainty and new difficulties (Shah et al. 2020).

METHODOLOGY

Since simple rule-of-thumb metrics give a skewed image, a thorough analysis is required to determine how much actual commercial real estate prices reflect economic fundamentals. It will begin by defining fair commercial real estate prices in order to calculate the misalignment as the difference between current commercial real estate prices and those implied by fundamentals. According to Campbell and Shiller (1989), the price of commercial real estate can be described in terms of the growth of net operating income (NOI) both currently and in the future as well as the overall returns on commercial real estate holdings. The model is based on the equation developed by Deghi et al. (2021)

$$\log \frac{Price_t}{NOI_t} = k = \rho \log \frac{Price_{t+1}}{NOI_{t+1}} + \Delta \log (NOI_{t+1}) Return_{t+1} \quad \text{(Equation 1)}$$

Where:

$Price_t$, (NOI_{t+1}) and $Return_{t+1}$ = commercial real estate prices

NOI = Consumer Price Index

$Return = \frac{Price_{t+} NOI_t}{Price_{t+1}} = spread_t + 3MRATE_t - Inflation$ (Equation 2)

The equilibrium process is expresses by using structural autoregression (SVAR):

$Ay_t = B_0 + B(L)y_{t-1} + u_t$ (Equation 3)

Where y_{t-1} = vector variables reflecting economic performance

A = Relationship between variables

$B(L)$ = effect from past shocks

FINDINGS
The total sample of this research has 4578 across all 14 states major cities in Malaysia from Bricks Database over the period January 2000 to December 2021. Table 1 presents the descriptive statistics of the variables used in the empirical analysis. Price growth has seen small annualised change over the period of the case study period. The slow pace of growth has also seen in GDP as well as in total return. In addition, present day growth has seen contraction percentage change during the high peak of pandemic period.

Table 1: Descriptive Statistics

Variable	Mean	SD	Min	Max
Price Growth	0.12	1.83	-21.34	8.09
GDP Growth	0.04	1.12	-6.34	20.44
Total Return	0.01	1.68	-17.45	9.43
Interest Rate	2.55	2.22	-0.80	12.00
NOI Growth	-0.43	4.03	-50.44	75.67
Monetary Policy	0.00	0.27	-1.52	1.32

This study re-estimates our specification while allowing for time-varying factors for increased robustness. In the panel quantile estimation following the fourth quarter in the forecasting horizon, the standardised coefficients of the commercial real estate price misalignment variable are the greatest among the important components, as shown in Table 2. These results

provide more evidence for the importance of commercial real estate price misalignment for monetary stability. According to the calculations, a one standard deviation increase in the misalignment measure, which corresponds to a capitalisation rate that deviates by 10 basis points from its long-term trend, increases the downside risk to GDP growth by 1.4% points in the short term (over the course of four quarters cumulatively) and 2.5% points in the medium term (cumulatively over 12 quarters).

Over the course of the whole predicting horizon, the coefficients are negative and statistically significant. Our findings are also resilient to the addition of measurements of the credit-to-GDP gap, allaying worries about confounding factors brought on by the relationship between GDP and financial leverage. The model has been re-estimate equation (2) individually for advanced and developing market economies because the structure of the financial system and commercial real estate markets may vary between the two.

These results demonstrate that larger CRE price misalignments raise the adverse risk to GDP growth. Importantly, despite the impact is less and statistically weaker for the latter, commercial real estate price misalignment has a considerable impact on GDP growth in both advanced and developing market nations. The lesser scale of their commercial real estate markets and the smaller credit-to-GDP imbalance in comparison to established economies may be a factor in the lower predicted impact for emerging market economies.

Table 2: Commercial Properties by Each Sectors Price at Risk: 2000-2022

Variables	h=1	h=2	h=3	h=4	h=5	h=6	h=7	h=8	h=9
Price	0.172	0.171	0.1102	0.172	0.167	0.083	0.070	0.0021	0.041
Growth	(0.108)	(0.080)	(0.141)	(0.132)	(0.112)	(0.109)	(0.123)	(0.112)	(0.093)
GDP	-0.223	-0.144	-0.132	-0.092	-0.009	-0.010	-0.021	-0.020	-0.029
Growth	(0.112)	(0.072)	(0.060)	(0.092)	(0.087)	(0.087)	(0.072)	(0.065)	(0.053)
Total	-0.335	-0.471	-0.445	-0.523	-0.552	-0.578	-0.583	-0.625	-0.557
Return	(0.172)	(0.072)	(0.154)	(0.145)	(0.187)	(0.117)	(0.111)	(0.124)	(0.110)
Interest	-0.432	-0.432	-0.382	-0.391	-0.391	-0.291	-0.223	-0.259	-0.258
Rate	(0.104)	(0.081)	(0.121)	(0.110)	(0.115)	(0.141)	(0.141)	(0.071)	(0.091)
NOI	-0.340	-0.481	-0.571	-0.577	-0.594	-0.522	-0.567	-0.559	-0.640
Growth	(0.059)	(0.099)	(0.113)	(0.120)	(0.131)	(0.108)	(0.144)	(0.142)	(0.112)
Monetary	-0.451	-0.477	-0.411	-0.371	-0.323	-0.318	-0.269	-0.238	-0.231
Policy	(0.132)	(0.069)	(0.062)	(0.049)	(0.029)	(0.029)	(0.031)	(0.032)	(0.023)
Leisure	-0.433	-0.291	-0.201	-0.143	-0.124	-0.88	-0.011	0.043	0.067
Property	(0.131)	(0.114)	(0.110)	(0.075)	(0.030)	(0.051)	(0.043)	(0.043)	(0.032)
Office	-0.502	-0.551	(0.112)	0.312	0.279	0.299	0.244	0.184	0.192
Property	(0.177)	(0.155)	0.155)	(0.072)	(0.066)	(0.052)	(0.067)	(0.055)	(0.055)
Retail	-0.311	-0.311	0.148	0.311	0.278	0.291	0.244	0.182	0.191
Property	(0.152)	(0.129)	(0.109)	(0.075)	(0.065)	(0.051)	(0.071)	(0.049)	(0.031)

CONCLUSION
When considered collectively, the results show that price misalignment can interact with other financial weaknesses, which magnifies its impact on the size of economic downturns. As a result of banks' heightened risk appetite, they may lend to less creditworthy companies during times of strong credit growth, which could explain why credit losses during downturns are larger, especially when there has been a significant correction in asset prices. Depending on the misalignment's sign, it's probable that the impact on economic tail risk changes. It makes sense that periods of overvaluation, which correlate to positive misalignments, would have a greater impact on financial fragility. As a result, this study also includes in equation (2) an interaction term between the misalignment of commercial real estate prices and an indicator variable that equals 1 when it is positive. As anticipated, the interaction term's coefficient is negative and significant, whereas the single term's coefficient is no longer significant. The findings revealed that it is possible for macroprudential measures to have a role in averting a rise in commercial real estate market vulnerabilities. This is a crucial topic given the detrimental consequences of commercial real estate pricing misalignments on macro-financial stability described in the preceding section. Although commercial real estate price levels are not a policy target in and of themselves, macroprudential measures could theoretically reduce the possibility of significant commercial real estate price corrections and ease the pressure from adjustments should a correction take place. Overall, the results imply that macroprudential regulations play a significant role in reducing the vulnerabilities of the commercial real estate sector. In terms of numbers, a tightening of targeted CRE policies lowers short-term downside risks to CRE price increases by 0.3% points per quarter (over 8 quarters). Economically speaking, this conclusion suggests that a macroprudential tightening targeted at commercial real estate vulnerabilities two years before to the global financial crisis would have decreased the decline in commercial real estate prices from about 14% to 6.5% on average.

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MALAYSIAN PROPERTY MARKET, THE STOCK MARKET AND MACROECONOMIC VARIABLES

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Abstract
This study examined the interactions and linkages between the property market, stock market, and macroeconomic variables. The stock market, in the long run, has a significant impact on property. Changes in house prices and stock markets have wealth and credit-price effects spilled over to economic growth. Both property and equity markets have a close dependency on income, inflation and monetary policy. The inference and dynamic relationship within asset markets have the capacity to explain the boom and bust cycles. The great potential lies with property and stock market interaction mechanisms to reflect economic conditions and as a source to enrich the present macroeconomic indicators. The Malaysian equity market was observed to be significantly co-integrated with the disaggregated real estate market (state level). The real estate market was mainly found to have a positive relationship with the stock market, GDP per capita (income) and consumer price index (CPI). However, real estate always had a negative relationship with interest rates. While real estate had a positive relationship with real GDP per capita in the long run, the relationship was not significant. This insignificance relationship covers all states and property types. The income coefficients were low and most of non-causality in the short run. This suggests a need for cautious from house price overheating. Price upsurge beyond the reach of the public may get caught with a sudden decline of the people's affordability level. The impact of property price increase was higher than CPI (inflation). The inflation positive response on property is unusual as it normally follows the interest rate being negative. The shortage of affordable houses has pushed up prices. Inflation coefficients were mainly significant and much higher compared to stock and income coefficients. In short term dynamic linkages, bidirectional causality was detected between lending rates and the overall property market. This suggests a high temporal impact of monetary policy on the property market at the national level.

Keywords: Property, stock, macroeconomics, interactions, economic indications

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INTRODUCTION

Property and stock markets are an integral part of the economy and must not be treated separately. On the other hand, more often, issues on house price, low investment and inflation were observed in isolations. Lessons learned from the economic crisis proved that a healthy economy comes from both healthy stock and property market, and vice versa. This suggests that the linkages between stock and property market granted a common basis of inference. This study is positive with the mechanism of interactions between the assets markets' ability to reflect on real economic activities. The asset markets interactions evidences may hold the foundation for a reliable and useful analysis, which might be added to the present macroeconomic indicators. The knowledge gap is noticeable as there is a need for more relevant and effective economic indicators. Without suitable and sufficient economic signals, critical constraints facing the economy remain hardly guided. The magnitude of the problem can be severe as it may drag the whole economy. More guided economic indicators may have avoided the overbuilding and over-investment as property glut may have crippled the banking and financial industry.

The function of property in the wider economy is rarely being considered together. Friggit (2009) suggested that it would be worthy to consider house prices in their correlation with real and financial variables, such as bonds or stock exchange prices. Miller et al. (2011) observed that house price movements have significant effects on economic growth, as well study by Anderson and Beracha (2010) noted home price changes are positively related to returns on stocks and bonds.

Property, Stock Market and Economic Performance Linkages

Property and stock, share some similar characteristics that they are both main components of the financial system. Both total property value and stock market capitalisation will increase by the increase in the surplus fund, the new capital formation (economic investment) or flow of financial capital, a general growth in GDP and reduction in interest rates. It was noted in Table 1.0 that a drop by 53.4% in total stock market capitalisation in 1997 was followed by a drop by 47.5% in total property transaction value in 1998. Whilst a drop by 40% in total stock market capitalisation in 2008 was followed by a drop by 8.3 % in total property market transaction value in 2009. This suggest that there are some forms of linkage and correlation between the stock market and property market.

Table 1.0: Comparing the Property, Stock and Variables

Year	(RM Billion) Total Property Transaction Value	% Change	(RM Billion) Total Stock Market Capitalization	% Change	% Real GDP Growth	% Average Lending Rate	CPI
1990	16.6	-	132	-	9.7 8.7	8.99	70.6
1991	18.7	12.7 14.4	162	22.7	7.8	9.72	73.6
1992	21.4	10.3 25.8	246	51.9 152	8.0 9.2	10.29	77.1
1993	23.6	34.2	620	(17.9)	9.5 8.2	9.65 8.24	79.9
1994	29.7	22.9	509	11.2	8.0	9.28	82.8
1995	39.8	8.4	566	42.6	(6.9)	10.12	85.7
1996	49.0	(47.5)	807	(53.4)	6.1 8.3	11.51	88.7
1997	53.1	23.3	376	(0.3)	0.3 4.4	9.72	91.0
1998	27.9	14.0	375	47.5	5.5 7.2	7.75 7.46	95.8
1999	34.4	(1.5)	553	(19.7)	5.2 5.9	6.67 6.51	98.5
2000	39.2	0	444	4.7	6.3	6.11 5.98	101
2001	38.6	12.2	465	0.4	4.6	6.12 6.57	101.6
2002	38.6	38.6	467	37.0	(1.7)	6.29 6.08	106.9
2003	43.3	(5.3)	640	12.8	7.2	4.83	108.6
2004	60.0	8.5	722	(3.74)		5.06	116.7
2005	56.8	25.2	695	22.2			123.2
2006	61.6	14.5	849	30.3			130.4
2007	77.1	(8.3)	1,106	(40.0)			140.2
2008	88.3	32.7	664	50.6			144.3
2009	81.0		1,000	27.5			146.5
2010	107.5		1,275				159.2

Source: JPPH, Bursa Malaysia and Bank Negara (1990 – 2010).

From the Figure 1.0 performance pattern evidence, we can conclude that the property and capital markets have some forms of meaningful relationship. To have an overall picture of the various index performance, Figure 1.0 indicates the main indexes i.e. Malaysian all house price index, FTSE BM Property Index and FTSE BM Composite Index. It is notable that both Malaysia house price index and FTSE BM KL Composite Index graphs shared an almost common performance pattern, although they are not exactly similar.
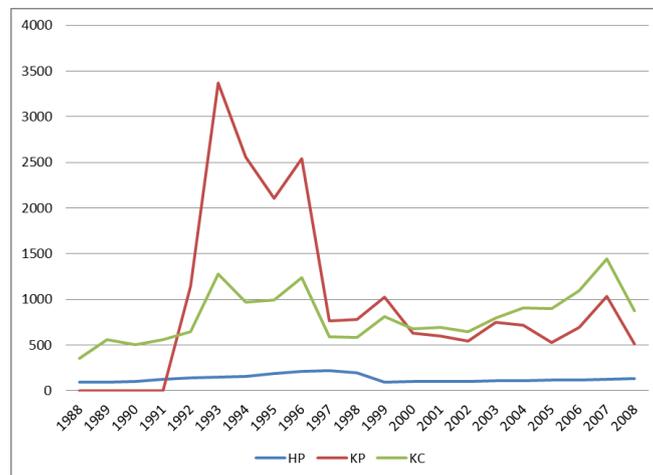
Figure 1.0: Various Index Performance Graph
Source: JPPH (NAPIC) & Malaysian Bourse (1988 – 2008).
Note: HP: Malaysian all house price index, KP: FTSE BM Property Index, KC: FTSE BM Composite
Index

PROBLEM STATEMENTS

This study sympathised with Gallin (2006); who noted US house price has grown too quickly, too high in relative to per capita income. He does not support other literatures who found house price and income are cointegrated.

Inadequate and less effective economic signals in the environment today are indeed a serious challenge. The current economic indicators are seen as lack of internal feedbacks which the asset markets themselves could instead tell better. More research is yet to be intensified to rectify these limitations and at the same time to strengthen this statement. This study observed the great potential lies within the property and stock market interaction analysis as a source to enrich the present macroeconomic indicators. The inference effects between asset markets have the capacity to explain the boom and bust cycles. Given the importance of asset markets to the macro economy and their intense interactions with macroeconomic performance as manifested by the Asian and the global financial crisis, the unique asset markets relationship is inclined of taking the guiding role. There is too little evidence on Malaysian asset market interaction to tell whether the property market and stock market are cointegrated, segmented, mixed or changing relationships.

LITERATURE REVIEW
Theory on Property Market – Stock Market Relations

The most appropriate theory to describe the linkage between real estate and capital market is the theory of wealth effects and credit–price effects. This theory

reflects the bonding and interaction effects of the assets market. House price, being both investment and consumption goods, is affected by stock market fluctuations through the well-known wealth effects. The increasing share of stocks in investment portfolios and increases in stock prices may motivate people to invest in housing, resulting in translation into higher housing prices. With real estate dominance due to the credit-price effect, the property market may lead to the stock market.

In assessing house price-stock price relations in Thailand, Mansor (2010) noted that the results obtained unequivocally suggested the presence of the wealth effect in the relationship between house prices and stock prices. Namely, in a vector error-correction setting, house prices seem to bear the burden of making adjustment towards the long-run relationship that ties the variables together.

Mansor (2010) also observed that houses and stocks are considered as investment alternatives. At the same time, the former is also viewed as consumption goods. The unexpected gains in stock prices reflecting the increasing share of the stocks in the investment portfolio and wealth and motivate households to rebalance their portfolios by investing in or consuming more housing services. This is the so-called wealth effect, thus, posits a causal direction from stock prices to house prices. Meanwhile, the credit-price effect tends to suggest a reverse causation from house prices to stock prices and admits the possibility of persistent spiralling upturns in both prices.

Traditionally, Eddie (2012) found the Hong Kong stock market and property market are highly correlated, from which either one of these two effects arise: wealth effect (i.e. from stock market to property market) and credit price effect (i.e. from property market to stock market). The wealth effect is usually observed, as the stock market leads the property market.

The wealth effect between stock and property market is asymmetric in the US and it is more significant when the stock price outperforms the housing price over a certain level (I-Chun et al. 2012). As the bull market induces an increase in the stock prices, it subsequently creates wealth for investors. The difference between stock prices and real estate prices reaches a certain level, housing prices soar thereafter. In this market condition, cointegration exists among the markets.

Empirical Study on Asset Markets – Macroeconomic Relations
There are rapid rises in housing or real estate wealth effect either by a sharp increase in asset valuations, an increase in GDP or increase in stock activities. Asset prices have a wealth effect on consumption and economic activity.

National and regional factors are said to have influenced the price increase in the housing boom. Anderson and Beracha (2010) noted home price changes are positively related to returns on stocks and bonds, where home prices

in expensive areas or owners of high-priced homes have greater exposure to capital market risk, in line with higher levels of wealth and capital market participation in US. Property markets are negatively affected by the respective unemployment rates in UK and Germany (Schatz and Sebastian 2009). Over the last decade, many researchers have been trying to compare asset price movements onto GDP, regardless of the business cycle they are in. Jie et al. (2010) uses Granger causality on the relationship between real estate investment and GDP per capita growth and found that regions where GDP per capita is low have reflected low real estate investment and vice versa. Kuang et al. (2011) found, in contrast, GDP growth has a very marginal effect on the impulse response for all assets. Sterk (2010) presents that great recession and a fall in house prices or a decline in home equity level creating unemployment and distortions in the labour market where house owners and renters with lack of down payment for new house is reluctant to move to new area to seek for jobs elsewhere. The increasing lending amounts shows growth effect has intensify real estate and capital market activities. Zheng et al. (2011) argued that positive co-movement between land prices and business investment are driving force behind the broad impact of land price dynamics on the macroeconomy, and that land is a valuable collateral asset that firms use to finance investment spending. Changes in asset prices affect net wealth and thereby affect the collateral available for borrowing (William 2011).

METHODOLOGY - DATA
This study of interactions between the property market and capital market includes the main determinants factors of both asset markets. The data used in this study are: Malaysia house price index, made up of Malaysia overall house index as well as all the 14 states house index and types of property index (e.g., high-rise house index, detached house index, semi-detached house index, and terrace house index), FTSE Bursa Malaysia Kuala Lumpur Composite Index (FBM KLCI), real GDP per capita (income), Interest Lending Rate (average by Commercial Banks) and CPI (inflation).

Estimation Methodology Procedure: Unit Root Tests
a) Augmented Dickey-Fuller (ADF)
Dickey-Fuller ADF test was initially introduced by David Dickey and Wayner Fuller in 1979. The tests for unit root identify whether an individual series (Y_t) is stationary by running an ordinal least square (OLS) regression equation. The ADF test makes a parametric correction for higher-order correlation by assuming that the y series follow an AR (ρ) process and adjusting the test methodology where ρ is the number of lagged changes in Y_t necessary to make ε_t serially uncorrelated. Two types of Dickey-Fuller regressions covered the non-linear trend and linear trend element respectively as shown in equation (i) and (ii)

$$\Delta Y_t = \beta_1 + \delta Y_{t-1} + \sum_{i=1}^{p} \gamma_i \, \Delta Y_{t-i} + \varepsilon_t \tag{i}$$

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \sum_{i=1}^{p} \gamma_i \, \Delta Y_{t-i} + \varepsilon_t \tag{ii}$$

Where t is the time trend variable, Δ is the first-differenced operator, Yt is the logarithm of the variable in period t, $\Delta Yt = Yt - Yt\text{-}1$, εt is white noise error term, δ and β2 are the constant parameters.

b) **Phillips-Perron (PP)**
More weight was given to the Phillips-Perron unit root test as this test has been shown to be more reliable than the Dickey-Fuller test in the presence of large amounts of heteroscedasticity. The PP unit root test proposed by Phillips and Perron (1988) and has an advantage as it propose a nonparametric method of controlling for higher-order serial correlation in a series. The PP unit root test is performed by conducting the following regressions as shown in (iii) and (iv):

$$Yt = \alpha0 + \beta Yt\text{-}1 + \eta t \tag{iii}$$
$$Yt = \alpha0 + \alpha1t + \beta Yt\text{-}1 + \eta t \tag{iv}$$

Where α0 is the intercept, β and α1 is the estimator of the equilibrium parameters, and t is the trend term and ηt is white noise error term.

Estimation Methodology Procedure: Johansen Cointegration Analysis
Formally, if two or more non-stationary time series share a common trend, then they are said to be cointegrated. The theoretical framework highlighted are expressed as following: the component of the vector Yt = (y1t,y2t,…,ynt)' are considered to be cointegrated of order d,b, denoted Yt ~ CI (d,b) if (i) all the component Yt are stationary after n difference, or integrated of order d and noted as Yt ~ I(d). (ii) Presence of a vector β = (β1, β2,…, βn) in such that linear combination βYt = β1y1t + β2y2t +…+ βnynt whereby the vector β is named the cointegrating vector. Johansen's (1991) cointegration test is adopted to determine whether the linear combination of the series possesses a long-run equilibrium relationship. The numbers of significant cointegrating vectors in non-stationary time series are tested by using the maximum likelihood-based λtrace and λmax statistics introduced by Johansen (1991) and Juselius (1990). Following a vector autoregressive (VAR) model, it involves the identification of rank of the n X n matrix $\prod$ in the specification given in (v) by:

$$\Delta Y_t = \delta + \sum_{i=1}^{k-1} \Gamma_i \, \Delta Y_{t-i} + \prod Y_{t-k} + \varepsilon_t \qquad\qquad (v)$$

Where Yt is a column vector of the n variables, Δ is the difference operator, Γ and $\prod$ are the coefficient matrices, k denotes the lag length and δ is a constant.

Estimation Procedure: VECM and Granger-Causality Based on VECM
As pointed out by Engle and Granger (1987), even though individual time series are non-stationary, linear combinations of them can be, because equilibrium forces tend to keep such series together in the long run. Moreover, if cointegration is detected then the Granger causality must be conducted in VECM to avoid the problem of misspecification (Granger, 1988). Otherwise, the analysis may be conducted as a standard vector autoregressive (VAR) model. VECM is a special case of VAR that imposes cointegration on its variables. This direction of the Granger causality can only be detected through the VECM derived from the long run cointegrating vectors. In addition, to indicate the direction of causality amongst variables, the VECM also allow us to distinguish between short-run and long-run Granger causality.

The Model
Under this section, the empirical model that will be estimated is discussed. The general functions are as below:

$$prop = f\{stock, macro., others\} \qquad\qquad (vi)$$

To evaluate the general functions above in Equations (vi), the following steps were taken. Rephrasing Equation (vi) as:

$$\ln prop_t = \beta_0 + \beta_1 \ln stock_t + \beta_2 \ln macroeconomic variables_t + \varepsilon_t \qquad (vii)$$

Equation (vii) hereby can be detailed as follows:

$$\ln prop_t = \beta_0 + \beta_1 \ln GDPpc + \beta_2 \ln stock_t + \beta 3 \ln CPI + \beta 4 \ln int_t + \varepsilon_{ijt} \quad (viii)$$

Where $prop_t$ is the property market index both at the aggregated (national) and disaggregated level (state).

Thus, due to need to obtain both long-run and dynamic impact, the writer came up with an error correction cum cointegration model as per Equation (ix) model for property market that will be estimated in this study:

$$\ln prop_t = \alpha_0 + \alpha_1 \ln GDPpc_t + \alpha_2 \ln stock_t + \alpha_3 \ln CPI_t + \alpha_4 \ln int_t + \upsilon_t \qquad\qquad (ix)$$

Thereby specifying: $EC\ t = \upsilon t$

$$EC\ t = \ln prop_t - (\alpha_0 + \alpha_1 \ln GDPpc_t + \alpha_2 \ln stock_t + \alpha_3 \ln CPI_t + \alpha_4 \ln int_t) \qquad (x)$$

Subsequently:

$$EC\ t{-}1 = \ln prop_{t-1} - (\alpha_0 + \alpha_1 \ln GDPpc_{t-1} + \alpha_2 \ln stock_{t-1} + \alpha_3 \ln CPI_{t-1} + \alpha_4 \ln int_{t-1}) \qquad (xi)$$

Thus, the ECM model to be estimated is as below:

$$\Delta \ln prop_t = \beta_0 + \beta_1 EC_{t-1} + \sum_{\substack{t-i \\ p}} \alpha_i \Delta \ln GDPpc_{t-1} + \sum_{\substack{t-i \\ p}} \theta_i \Delta \ln stock_{t-1} \qquad (xii)$$

$$+ \sum_{t=i} \phi_i \Delta \ln CPI_{t-1} + \sum_{t=i} \delta_i \Delta \ln int_{t-1} + \sum_{t=i} \lambda_i \Delta \ln prop_{t-1} + \omega_{it}$$

The selected variables for the regressors for the study are as follows: -

➢ $\ln GDPpc_t$ is the logarithm of real gross domestic product per capita,
➢ $\ln stock_t$ is the logarithm of stock
➢ $\ln CPI_t$ is the logarithm of Consumer Price Index
➢ $\ln int_t$ is the logarithm of interest rate,
➢ $\ln prop_t$ is the logarithm of property
➢ ε_{ijt} is the error term.

All variables obtained from various sources, are as per the following Table 2.0:

Table 2.0: Definition of Variables Used in the Study

Variable Name	Brief Description	Sources of Data
GDPpc: Gross Domestic Product per capita	Real GDP per capita (Income)	BANK NEGARA
Int: Average bank lending rate	Interest rates	BANK NEGARA
Stock: Capital market	Stock Market KL composite index	FTSE BM (KL BOURSE)
CPI: Consumer Price Index	(inflation)	BANK NEGARA MALAYSIA
Prop: Residential Property Market – (Locations)	All 14 states and Malaysia housing market index	NAPIC/INSPEN

Variable Name	Brief Description	Sources of Data
Prop: Residential Property Market – (Types)	Terrace, high rise, semidetached, detached house market index	NATIONAL ROPERTY INFORMATION CENTRE (NAPIC/INSPEN)

EMPIRICAL RESULTS
Results of Unit Root Tests – ADF, PP

Unit root test was conducted on the property and stock market and the macroeconomic variables. The results of Dickey-FullerADF and Philip-Perron (PP) unit root tests describe the stationary properties of the variables. Schwartz Information Criteria (SIC) is used to select the optimal truncation lag length to ensure the errors are white noise. These results indicated that all the series under study are non-stationary in their level form (Table 3.0). In Table 4.0, all the series can reject a unit root in first difference. The test statistics for all the series are significantly different from zero at five % level. The result suggests that all series are I(1) processes. An I(1) series in order to achieve stationary, the series needs to be differenced once.

Table 3.0: Results of Unit Root Test: Level

Variables	ADF – Level	PP – Level	Remarks
High rise	-0.4100	0.1625	Non stationary
Semidee	1.0129	0.9968	Non stationary
Terrace	1.7545	1.9229	Non stationary
Overall	1.1784	1.8514	Non stationary
Interest	-1.0184	-1.1819	Non stationary
Cpi	-1.3456	-1.0072	Non stationary
Gdp pc	-1.2680	-0.9577	Non stationary
Stock	-1.1335	-0.7819	Non stationary
Johor	-1.7890	-1.7677	Non stationary
Kedah	-0.3749	-0.5455	Non stationary
Kelantan	1.3950	0.8411	Non stationary
KL	-0.0020	1.4426	Non stationary
Melaka	0.0688	-1.1968	Non stationary
Negeri	-0.3160	0.0096	Non stationary
Pahang	-0.9512	-1.1412	Non stationary
Penang	-0.3531	-0.0289	Non stationary
Perak	-1.6927	-0.6857	Non stationary
Perlis	-1.1881	-1.0315	Non stationary
Sabah	-0.0920	0.8766	Non stationary
Sarawak	0.1958	0.5907	Non stationary
Selangor	0.3839	0.6521	Non stationary

Note: *** denotes significance at 1% level

Table 4.0: Results of Unit Root Test: 1st Difference

Variables	ADF – 1st Difference	PP – 1st Difference	Remarks
Detached	-6.6793***	-6.6793***	Stationary
High rise	-7.7559***	-12.7742***	Stationary
Semidee	-9.4161***	-9.4794***	Stationary
Terrace	-7.9269***	-7.9269***	Stationary
Overall	-6.8218***	-6.8208***	Stationary
Interest	-53807***	-5.4591***	Stationary
Cpi	-6.5552***	-12.4919***	Stationary
Gdp pc	-4.1182***	-9.4448***	Stationary
Stock	-4.3742***	-4.3058***	Stationary
Johor	-6.6793***	-6.6793***	Stationary
Kedah	-9.9046***	-10.4662***	Stationary
Kelantan	-6.9818***	-10.0783***	Stationary
KL	-7.9608***	-9.6104***	Stationary
Melaka	-11.9885***	-15.3699***	Stationary

Note: *** denotes significance at 1% level

According to Engle and Granger (1987), two non-stationary time series are cointegrated if their combinations are stationary. Cointegration implies that there is a bounded, linear combination of the levels of the two variables.

Johansen Cointegration Test
Moving on from the earlier root test, the cointegration test is conducted to determine the presence of a long run equilibrium relationship. Since all the variables are noted to be I(1), there exists the possibility that they share a long-run equilibrium relationship. No cointegration test is necessary if the variables in the system are found to be I (0) or stationary. Since the results are non-stationary, the cointegration test is therefore necessary. To test this multivariate cointegration test of Johansen was applied.

The result from Table 5.0 seems indicated there is cointegration between the detached property market and the variables. The same thing happened to the high-rise market which has cointegration with the variables at 5% significant level. Terrace house market which recorded full rank is considered not cointegrated at 5% critical value. However, test on Semidetached market, it is observed that at least one cointegrating vector, thus semidee is cointegrated with stock, GDP income, inflation, and interest rates.

The results from Table 6.0 show there is cointegration between all the states' property market and the variables except Malaysia's overall market which shows a full rank situation implying there was no cointegration at 5% level. Therefore, our results clearly suggest that in the long run property prices in Malaysia (even states) are affected by macroeconomic variables.

Table 5.0: Results of Johansen Cointegration Test by Property Types

Null Hypo	Alt Hypo	Max Eigen	Critical Val	Trace	Critical Val
A) Property Type: Detached = f(Stock, GDP percapita, CPI, Interest)					
r=0	r>0	64.51133**	33.87687	111.6223**	69.81889
r≤1	r>1	24.34606	27.58434	47.11101	47.85613
r≤2	r>2	15.40597	21.13162	22.76496	29.79707
r≤3	r>3	6.676510	14.26460	7.358984	15.49471
r≤4	r>4	0.682474	3.841466	0.682474	3.841466
B) Property Type: Terrace = f(Stock, GDP percapita, CPI, Interest)					
r=0	r>0	54.35524**	33.87687	121.6591**	69.81889
r≤1	r>1	35.26000**	27.58434	67.30381**	47.85613
r≤2	r>2	14.88135	21.13162	32.04381**	29.79707
r≤3	r>3	13.17266	14.26460	17.16246**	15.49471
r≤4	r>4	3.989794**	3.841466	3.989794**	3.841466
C)Property Type: High-rise = f(Stock, GDP percapita, CPI, Interest)					
r=0	r>0	51.52317**	33.87687	93.40180**	69.81889
r≤1	r>1	22.66802	27.58434	41.87863	47.85613
r≤2	r>2	15.03675	21.13162	19.21061	29.79707
r≤3	r>3	3.935590	14.26460	4.173858	15.49471
r≤4	r>4	0.238268	3.841466	0.238268	3.841466
D)Property Type: Semidee = f(Stock, GDP percapita, CPI, Interest)					
r=0	r>0	63.12637**	33.87687	127.2125**	69.81889
r≤1	r>1	36.74924**	27.58434	64.08610**	47.85613
r≤2	r>2	22.86885**	21.13162	27.33686	29.79707
r≤3	r>3	4.333764	14.26460	4.468011	15.49471
r≤4	r>4	0.134247	3.841466	0.134247	3.841466
E) Property State : Kuala Lumpur = f(Stock, GDP percapita, CPI, Interest)					
r=0	r>0	57.64060**	33.87687	132.0483**	69.81889
r≤1	r>1	43.45980**	27.58434	74.40769**	47.85613
r≤2	r>2	24.82773**	21.13162	30.94789**	29.79707
r≤3	r>3	6.011675	14.26460	6.120160	15.49471
r≤4	r>4	0.108485	3.841466	0.108485	3.841466
F) Property State : Selangor = f(Stock, GDP percapita, CPI, Interest)					
r=0	r>0	52.20932**	33.87687	117.8190**	69.81889
r≤1	r>1	34.14028**	27.58434	65.60967**	47.85613
r≤2	r>2	22.33697**	21.13162	31.46939**	29.79707
r≤3	r>3	6.370743	14.26460	9.132428	15.49471

| r≤4 | r>4 | 2.761686 | 3.841466 | 2.761686 | 3.841466 |

Note: ** denotes significance 5% probability level   Lags: 3, Critical Value at 5%

RELATIONSHIP BASED ON VECM AND GRANGER CAUSALITY

The VECM is adopted to study the relationship of the stock market, GDP income per capita, CPI (inflation) and banks' lending rates in the property market performance. Granger causality test is used to investigate the temporal relationship between the property market and the capital market. In the Granger causality test, the degree of exogeneity can be identified through the lagged error correction term. The testing is whether a particular variable precedes another and not causality in the sense of cause and effect. Figures in brackets "( )" are the probability of significance.

A precondition to Granger causality is to check the cointegrating properties of the variables since the standard test for Granger causality is not valid with the existence of 'cointegration' (Granger 1988). When two variables cointegrated, Granger causality should exist in at least one direction, meaning that cointegration implies causal effects in the sense of Granger (Engle and Granger 1987). With the error correction term obtained from the cointegrating regression, reincludes the long run information into the analysis and makes the direction of Granger causality worth investigated.

The VECM estimates showing the long-run relationship of house type as well as the VEC Granger Causality showing the short run of house type as shown as per Tables 7.0 and Table 8.0

Table 7.0: VECM estimates DEPENDENT: SEMIDEE TYPE
(Long run relationship)

Regressor: SEMIDEE	Stock	GDP per capital	CPI inflation	Interest
coefficient	-0.410296	0.125635	2.474068	-1.138763
Standard Error	(0.10120)	(0.30717)	(0.74542)	(0.13478)
t – statistic	[- 4.05420]	[0.40901]	[3.31902]	[- 8.44912]
significance	**		**	**

NOTE: ** denotes significance; standard error in ( ), t-statistics in [ ]; Lags= 3

Table 8.0: Short Run Causality Test VEC Granger Causality/Block Exogeneity Wald Tests DEPENDENT: SEMIDEE type

INDEPENDENT	causal	PROPERTY	PROPERTY	Causal	INDEPENDENT
Stock	-□ 9.5993 (0.022)**	Semidee	Semidee	-/-> 1.954 (0.58)	Stock

GDP percapi	-/-> 3.864 (0.276)	Semidee	Semidee	-/-> 1.419 (0.701	GDP percapi
CPI inflation	-/-> 1.956 (0.581)	Semidee	Semidee	-/-> 3.203 (0.361	CPI inflation
Interests	-/-> 0.922 (0.81)	Semidee	Semidee	-/-> 1.731 (0.630)	Interest

NOTES: Lags 3; Probability in parenthesis ( ) ; Coefficient: Chi-sq ** denotes significance 5% level,: (-/->) and (--□) indicates no Granger cause and Granger cause respectively.

From Table 9.0 the stock and interest are estimated to negatively influence the semidetached property market in the long run. On the other hand, income is estimated to positively influence property market for SEMIDEE. The results suggest that a 1 % increase in stock market, SEMIDEE property price decrease by 0.4%. For CPI, an increase of 1% will increase SEMIDEE price by 2.4%.

Table 9.0: Summary of VECM Long Run Relationship GDP per capita (inflation)

Regressor	Stock	CPI	Interest
Coefficient: JOHOR	-5.343325**	1.940920	15.88162**	-5.844685**
Standard Error	(0.82840)	(2.27313)	(5.29681)	(1.07550)
t – statistic	[- 6.45015]	[0.85385]	[2.99834]	[- 5.43437]
Coefficient: KEDAH	-1.546706**	0.946076	3.911858**	-2.169593**
Standard Error	(0.27783)	(0.78018)	(1.68307)	(0.36953)
t – statistic	[- 5.56708]	[1.21264]	[2.32424]	[- 5.87127]
Coefficient: KELANT	0.661253**	-0.077285	-1.133295**	-0.107845
Standard Error	(0.07353)	(0.23549)	(0.50017)	(0.09965)
t – statistic	[8.99301]	[- 0.32819]	[- 2.26582]	[- 1.08219]
Coefficient: KL	-0.162036	0.031162	1.995765**	-1.127738**
Standard Error	(0.09767)	(0.27127)	(0.65199)	(0.13729)
t – statistic	[- 1.65899]	[0.11487]	[3.06105]	[- 8.21398]
Coefficient: MELAKA	1.00495**	-0.702014	-2.53911**	1.29195**
Standard Error	(0.137050)	(0.396672)	(0.890351)	(0.189418)
t – statistic	[7.33280]	[- 1.7698]	[- 2.85182]	[6.82065]
Coefficient: NEGRI 9	-0.315791**	0.054334	1.688674**	-0.875673**
Standard Error	(0.08088)	(0.23379)	(0.51307)	(0.11201)
t – statistic	[- 3.90446]	[0.23240]	[3.29130]	[- 7.81759]
Coefficient: SELANGO	-6.700098**	5.263482	16.15925**	-2.780650**
Standard Error	(1.17639)	(2.98628)	(5.14069)	(1.24573)
t – statistic	[- 5.69545]	[1.76256]	[3.14340]	[- 2.23215]

Coefficient: TERENGG	7.610502**	-1.156015	-14.96996	8.082161**
Standard Error	(1.33025)	(3.93730)	(8.63370)	(1.78661)
t – statistic	[5.72111]	[- 0.29361]	[- 1.73390]	[4.52373]
Coefficient: DETACHE	-0.522888**	-0.084075	3.226661**	-1.520207**
Standard Error	(0.13722)	(0.40472)	(0.87762)	(0.21124)
t – statistic	[- 3.81064]	[- 0.20774]	[3.67661]	[- 7.19672]
Coefficient: HIGHRISE	5.935941**	-0.036633	-16.76158**	6.144262**
Standard Error	(1.06272)	(3.07583)	(6.96611)	(1.48201)
t – statistic	[5.58563]	[- 0.01191]	[- 2.40616]	[4.14591]
Coefficient: SEMIDEE	-0.410296**	0.125635	2.474068**	-1.138763**
Standard Error	(0.10120)	(0.30717)	(0.74542)	(0.13478)
t – statistic	[- 4.05420]	[0.40901]	[3.31902]	[- 8.44912]

*NOTE: ** denotes significance at 5% level.*

Table 10.0: Brief Summary of Short Run Granger Causality

Dependent	Independent			
	Stock	**GDP percapita**	**CPI (inflation)**	**Interest rates**
Overall Property	NC	NC	NC	I□O,O□I
Terrace	NC	NC	NC	T□I
Highrise	NC	NC	NC	NC
Semi detached	S□SD NC	NC	NC	NC
Detached	NC	G□D	D□C	I□D
Kedah	S □ J	K □ G NC	NC	NC
Johor	K □ S	NC	NC	J□I NC
Kelantan	S □ KL	G □ KL	NC	I □ KL NC
Kuala Lumpur	S □ M, M□S	NC	C□KL, KL□C	NC
Melaka	NC	NC	NC	NC
Negri Sembilan	NC	NC	NC	NC
Pahang	NC	NC	NC	NC
Penang	NC	P □G NC	NC	NC
Perak	S □ P NC	NC	NC	NC
Perlis	NC	NC	NC	NC
Sabah	S□S, S□S	NC	NC	NC
Sarawak	NC	NC	NC	NC
Selangor			NC	
Terengganu			NC	

NOTE: **NC = Non Causal**   **T = Terrace**   **□ = unidirectional**
         □ = Granger Cause   **H = highrise**   **□ □ = bidirectional**
         S = Stock   **SD = SemiDetached**
         G = GDP percapita   **D = Detached**
         C = CPI (inflation)   **I = Interest Rates**

CONCLUSIONS

This study has noted to what extent the interactions between property and capital markets exist. By taking the case of Malaysia's robust growth, this study observed that the stock market has contemporaneous cointegration with the property market. The stock and the GDP per capita "Market Interaction Value" (MIV) coefficient showed the highest influence on Penang, Selangor, and Johor residential properties. Inflations and interest rates MIVs also showed their highest influence on the three states. The high effects of those variables onto residential property in those states reflected their urbanised level as expected.

By referring to majority grouping, it is noted that stock (capital market) and interest rates (monetary policy) has negative influence on most of the states' property market, whilst GDP per capita (income) and CPI (inflation) has positive influence on most of the states' property market. Detached house type has a significant long-run relationship with stock, CPI and interest except for GDP per capita. GDP per capita and Interest rates Granger cause Detached whilst detached house market Granger cause CPI inflation.

The stock market is found to be cointegrated with both aggregated and disaggregated property market. One percent increase in stock price is followed by a 6% increase in the highrise-type house market or the increase by 9% of the Penang state house market. Based on VECM, unidirectional and bidirectional Granger causality was detected among the variables. Stock market Granger causes property markets namely in Johor, Kuala Lumpur, Selangor, Perlis and Melaka thus suggesting a substantial wealth effect running from stock to property market in those states whilst property market in Kelantan, Melaka and Selangor state Granger cause stock market indicating presence of credit-price effect. Generally, the property market of all types at all states level is cointegrated with stock (capital market), real GDP per capita (income), CPI (inflation) and interest rates (monetary policy).

Real GDP per capita has positive cointegration with property, however, most are not (t-statistic) significant. The per capita income insignificant involves all states except Kuala Lumpur and Melaka, with low coefficients and covers all property types and states. This may indicate the danger of a rapid rise in house prices and overheating which later not supported by people's income & affordability level. Wage increase has greatly lagged behind property price increase. Anxious overbuilt problems can start with declining demands, rising space vacancies, reduced rental yields and eventual soft landing of the property market.

Despite a 1% increase in CPI inflation, the detached house market increase by 3.22%. Thus, the house price impact is higher than inflation. Some states have positive inflation and it beats the norms that usually inflation is negative to property price (theoretically sharing the similar averse character with interest rates). The inflation coefficient of Penang with property is 19.2, Selangor

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16.1 and Johor 15.8; the magnitude which is very much higher than other states may indicate their level of inflation stress. The magnitude of their inflation coefficient on property is very much higher compared to inflation on stock (9.09; 6.7; 5.3), income (2.17; 5.26; 1.9) and interest (9.11; 2.7; 5.8) coefficients respectively. As inflation is significant to all states except Perlis and Pahang, cautious steps are therefore recommended to avoid the danger of inflation traps. Interest rates have a negative relationship with the property market of various types and states except the highrise type. Highrise has a positive relationship may due to the over influence of luxury and high-end type as expensiveness has become secondary.

Interest charges pose a substantial cost to real estate. Interest rates longrun impact is negative to property. The property market may show no spontaneous reactions to Bank Negara interest directives. The interest rate has bidirectional Granger causality with Malaysia's overall property market; this may indicate the high impact of the relationship between monetary policy and property market at the national level. This study observed the great potential lies within property and stock market interaction analysis as a source to enrich the present macroeconomic indicators. The inference effects between asset markets have the capacity to indicate the boom and bust cycles. Given the importance of asset markets to the macro economy and their intense interactions with macroeconomic performance as manifested by the Asian and the global financial crisis, the unique asset markets relationship has a better capacity to reflect economic conditions.

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IMPLEMENTATION OF ARTIFICIAL NEURAL NETWORK FOR STATE – OWNED ASSETS FORECASTING OF ROOM RENTAL PRICES IN INDONESIA

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Abstract

Leasing is a state-owned assets utilization scheme that needs to be optimize because of its easy to find objects and large potential for non-tax revenue. In the city of Yogyakarta, the economy grows above the national average, this is supported by the mobility of tourists, overseas students, and businessman. The characteristics of the regional economy are suitable for the optimization of state-owned assets through leasing scheme in the form of lodging room. The author tries to develop a state-owned assets leasing price forecasting model for lodging room using an Artificial Neural Network to capture the potential state revenue. By using market data for lodging room rental from the OYO website, author create a model architecture with the backpropagation algorithm. Analysis results of this study indicate that the obtained network model achieves an accuracy of 97.5%. There are 25 state-owned assets buildings that can be projected as objects of lodging space rental utilization with a predicted rental value of IDR 108,570.00 to IDR 122,669.00 per day.

Keywords: Artificial Neural Network, State-Owned Asset, Non-Tax Revenue, Yogyakarta

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INTRODUCTION

Lease is one of the most common utilization schemes for State Property. The rental mechanism also contributes more non-tax revenue (PNBP) than other BMN utilization schemes. As an illustration, in the 2019 central government financial report, revenue from rental utilization was recorded at 251,296,665,000 rupiah or around 45.42% of the total revenue sourced from the use of State-owned assets (BMN) (Indonesia, 2020). Meanwhile, 99.73% of the revenue was obtained from BMN leases in the form of land and buildings.

The implementation of the lease should be encouraged to be more active in order to obtain optimal utilization of BMN (Management, 2019). To achieve this, potential exploration needs to be done. The potential exploration carried out includes the identification of business opportunities and potential BMN. The implementation must consider the provisions related to the assessment in the context of the utilization of BMN. In practice, the efforts to explore potential encounter constraints of time and personnel constraints.

Based on the considerations above, to support the activity of extracting the BMN leases potential, a fast analysis method that is able to accurately represent the rental potential is needed. The Artificial Neural Network (ANN) is a branch of Artificial Intelligence. The ANN is an information processing system resembling a biological neural network (Fausett, 1994). Several applications that can be generated by ANN include pattern recognition, signal processing, and forecasting.

ANN has given the best results among several mass valuation models that are used to predict property values effectively (Yacim & Boshoff, 2016). In addition, the advantage of ANN as a property valuation model is that its construction allowing the use of a small data sample (Abidoye & Chan, 2017). Based on this description, the ANN approach is considered suitable to be applied as a predictive tool in the assessment in order to explore the potential utilization of State Property rental because it can provide fast and accurate analysis.

The online travel agency (OTA), Pegipegi, conducted a survey in collaboration with the international survey agency, YouGov. The survey, which was held in 2019, was conducted on more than 2,000 respondents spread throughout Indonesia to find out the traveling preferences of the Indonesian people. In this survey, Pegipegi found three types of preferences for Indonesian people's favourite tourist destinations. The survey results show, 78% of respondents choose to travel to destinations that offer beautiful views, 62% choose to travel to destinations with affordable costs, and 51% choose to travel to destinations that have cultural and historical heritage (Agmasari, 2019).

Referring to the survey results above, the city of Yogyakarta seems to be one of the alternatives that meet the preferences of potential tourists. It is found to be correlated with the low living cost in Yogyakarta, the number of natural

tourist destinations around the city, as well as the cultural and historical sites that have been attached to the image of this city (Yogyakarta City Tourism Office, 2019). In addition, the city of Yogyakarta has long been one of the favourite tourist destinations for both domestic and foreign tourists.

Yogyakarta, one of major city in Indonesia, is a city that has high mobility bustling with tourists, students and overseas students, as well as business people. This high mobility is one of the driving factors for economic activity in the city of Yogyakarta. Data from the Central Bureau of Statistics of the City of Yogyakarta shows that the economy of the city of Yogyakarta in 2019 grew 6.6%, higher than the national economic growth rate of 5.02% (Yogyakarta City Statistical Center, 2020).

The good economic growth and a high level of mobility due to tourism activities and several other activities are opportunities for the lodging business sector. In this case, the city of Yogyakarta is also often the activity centre for the central government work units because of its strategic location. There are at least 5 training centres with dormitories belonging to Ministries/Institutions around the city of Yogyakarta. Some of these conditions are opportunities in boosting the utilization of State Property rental through renting lodging rooms in the city of Yogyakarta.

LITERATURE REVIEW
State-owned assets, land and buildings, rental valuation using a market data approach
The factors compared in the rental valuation with the market approach are highly dependent on the type of use/utilization of the building/space and are adjusted to the characteristics of the object of the assessment. Adjustment factors with lodging objects can be and are not limited to the following items: transaction time, type of transaction, rental period, lodging location, lodging accessibility, type of lodging, material and interior design, lodging facilities, room size, surrounding view, type of accommodation. room, room facilities (The Director General of State Assets Management Regulation Number 4/KN/2018 Concerning Technical Instruction for Valuation of State Assets Lease, 2018).

Artificial Neural Network
ANN is a tool designed to resemble the human brain that aims to carry out a certain task (Haykin, 2008). The term 'artificial' or 'imitation' is used because neural networks are implemented using computer programs to solve problems and carry out learning in the process (Fausett, 1994).

ANN that has been exposed to the data will be able to make predictions by detecting the similarity of the input data pattern. ANN is not an exact duplication of the biological system of the human brain, but this artificial neural network can perform abilities such as generalization, learning, abstraction, and even intuition. The ability of ANN is quite good, as evidenced by several ANN

applications, it is very suitable to be applied to classification, association, self-organizing, and optimization (Hermawan, 2006).

ANN mimics the computational principles of biological neural networks found in the human brain. Human brains have a neural network of about 1011 nerve cells (neurons). In ANN, a neuron is assumed to a node functioning as a data processing element. The relationship between nodes in the ANN is obtained from the connection weight (weight) which models the synapses in the human brain neural network (Sudarto, 2002).

The concept of ANN can be observed from its working model in the form of the number of layers and the number of neurons. The layers making up the multilayer ANN are divided into three, the input layer, one or more hidden layers, and the output layer. The neurons located in the same layer will have the same state. The most important factor in determining the behaviour of a neuron is its activation function and weight pattern (Fausett, 1994). In each of the same layers, the neurons will have the same activation function. The neurons in one layer are connected to neurons in another layer, so that every neuron in that layer must also be connected to each neuron in another layer.

Activation function

The activation function is a function used to process input information. As an illustration, the activation function can be seen in Figure 2 below.
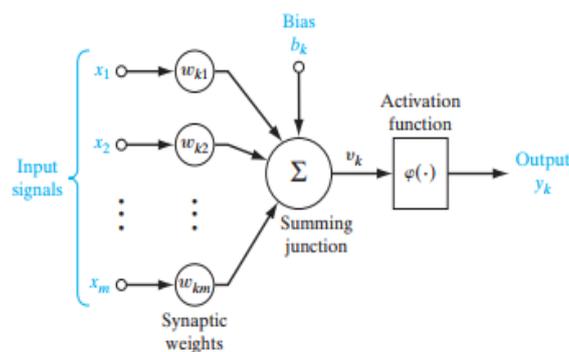
Figure 1: ANN Structure
Source: Haykin (2008)

Based on the ANN structure above, the transfer function functions to change a number of inputs (x_1, x_2,… x_m) which have weights (w_k1, w_k2, . . . w_km) and are biased into input values (v_k) for the activation function. Furthermore, the activation function processes the input value to be compared with the specified threshold and activates the value into output (y_k) (Haykin, 2008).

Backpropagation learning algorithm
Rumelhart, Hinton and William in 1986 first introduced an artificial neural network with a backpropagation algorithm which was later developed by Rumelhart and McClelland in 1988. Generally, an artificial neural network with a backpropagation algorithm is designed to operate on supervised learning methods. learning) with many layers (multi-layer network) which at least consists of input layer, hidden layer, and output layer (Haykin, 2008).

There are three stages in backpropagation training, including feedforward, backpropagation of error and weight and bias modification (Fausett, 1994). The way backpropagation works is first to look for the output error in a forward direction to correct the weights which is then carried out in a backward direction. At the time of forwarding there will be an activation function that will activate the neurons to produce output. The activation function used in backpropagation is generally continuous, differential, and does not descend like the sigmoid activation function.
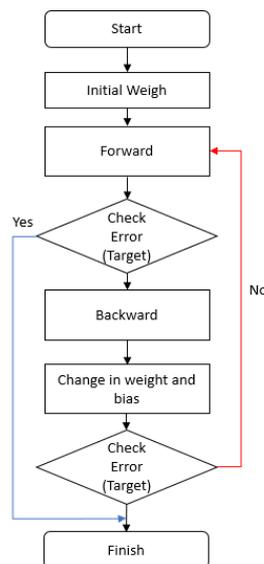
Figure 2: Stages of Backpropagation Learning Algorithm

Data normalization
In this backpropagation ANN algorithm, a binary sigmoid activation function is used where this function has a value between 0 to 1. Therefore, the data needs to be normalized first using the equation below:

$$E_i' = \frac{e_i - E_{min}}{E_{max} - E_{min}}$$

Meanwhile, to get results that match the original data form, the model output is denormalized using the equation:

$$e_i = E_i' (E_{max} - E_{min}) + E_{min}$$

RESEARCH METHODS
Research population
The object of research used is all data on lodging rental offers in the city of Yogyakarta and surrounding areas on the OYO website. In addition, several State-Owned Assets that meet the criteria for optimizing their use through lodging room rentals are then simulated for rent price predictions based on the ANN model formed from training on lodging rental price forecasting data. There are 51 data of lodging rental offers trained to simulate the rent price of 25 state-owned.

The types of BMN that are projected as objects of rental use include permanent dormitories, permanent resting places, and permanent flats. The location of the building is in Yogyakarta City and Sleman Regency which is located on the border of Yogyakarta City. In addition, the selection of locations also avoids objects that are in places where the work unit has duties and functions in the defense and presidential fields. The condition of the goods used in this study also only involved goods that were in good condition.

Research variable
In building the ANN model for forecasting the rental price of lodging rooms, it is necessary to determine the variables in the input layer and output layer. Based on the available information, with the scrapping method, the researcher draws information that is considered to affect the variable (Y), namely the rental price or the bid price. The extracted information is then used as the required supporting variable (X). For each of the lodging rental price forecasts, the supporting variables used include: accessibility (road width), location (area and distance to tourist centers), building structure, interior design, room area, room furniture, toilets, and other facilities (refrigerator, water heater, room service, swimming pool, fire extinguisher/ CCTV, generator, parking area, 24-hour reception).

Determination of operational variables for forecasting rental prices for lodging in the city of Yogyakarta and its surroundings is carried out by considering the factors compared in the valuation of the rental of part of the land and buildings in accordance with The Director General of State Assets

Management Regulation Number 4/KN/2018 Concerning Technical Instruction for Valuation of State Assets Lease, 2018, characteristics of the city of Yogyakarta, and information available on the website for lodging rental offers.

Research Framework
This study aims to develop the most accurate ANN model in forecasting accommodation rental prices. The model that is formed is then simulated against BMN data which is projected as the object of the use of lodging rentals to then know the prediction of the rental price.
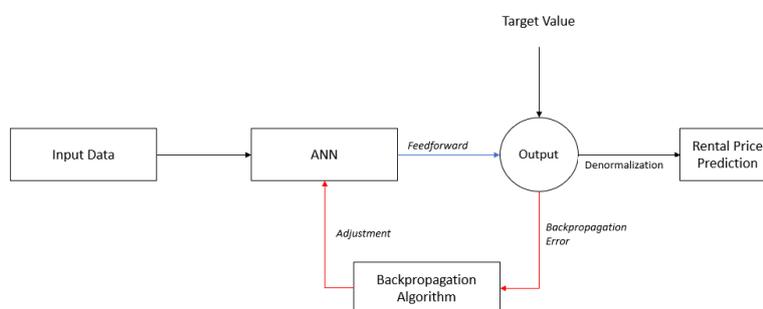
Figure 3: Research model

The preparation of the ANN model is done using the backpropagation algorithm (Fausett, 1994). When the training process on the backpropagation algorithm has been fulfilled, the weight pattern in the network has formed the best model. Under these conditions, the activation function integrates the input values and transfers them to the hidden layer. Operations in the hidden layer in the form of weighted addition and transformation function produce the value *Zj*. The *Zj* value can be formulated as follows
.

$$Zj = f(V_{0j} + \sum_{i=1}^{m}\sum_{j=1}^{n}X_i V_{ij})$$

for (i = 1, …, m dan j = 1, …, n)
Information
Zj = output value in hidden unit -j
f = nonlinier function
V_{0j} = bias weight on hidden unit -j
X_i = sum of the output values of the input units -i
V_{ij} = the weight of the input unit against the hidden unit-i

To get the output value, the value of Z_j is transferred to the output layer so that the output value can be calculated through the following equation:

$$Yk = f(W_{0k} + \sum_{j=1}^{n}\sum_{k=1}^{p}Z_j W_{jk})$$

for (k = 1, …., p dan j = 1, …, n)
Information:
Yk = output value in hidden unit -k
f   = nonlinier function
W_{0k} = bias weight on hidden unit -k
Z_j = sum of the output values of the input units -j
W_{jk} = hidden unit weight to output unit

   The weight value composing the two equations is the result of weight modification to produce the best model, namely the model with the lowest error value. The weight is the result of a modification of the backpropagation algorithm processing. Meanwhile, to obtain a rental price prediction, a denormalization process of the output data is carried out to the original form.

FINDING AND DISCUSSION

Based on the trial of the formation of a lodging rental price forecasting model using an Artificial Neural Network backpropagation algorithm, the best model was achieved with a MAPE value of 1.47%. Meanwhile, the determination of neurons in the hidden layer as the basis for testing the formation of the model is set at 2/3 part of the number of input and output neurons (Heaton, 2017).

Table 1: MAPE Value Resume on ANN Model Formation Test

Scenario	Number of Neurons in Hidden Layer	MAPE Value
1	11	3,51%
	12	1,47%
2	6	3,93%
	7	4,59%
3	6	5,12%
	7	4,63%

   The architecture for the ANN model that is formed based on the lowest MAPE value is presented in Figure 4. The daily lodging room rental price forecasting model consists of three layers consisting of 16 neurons in the input layer, 12 neurons in the hidden layer, one neuron in the output layer, and each there is one bias neuron that leads to the hidden layer and output layer.
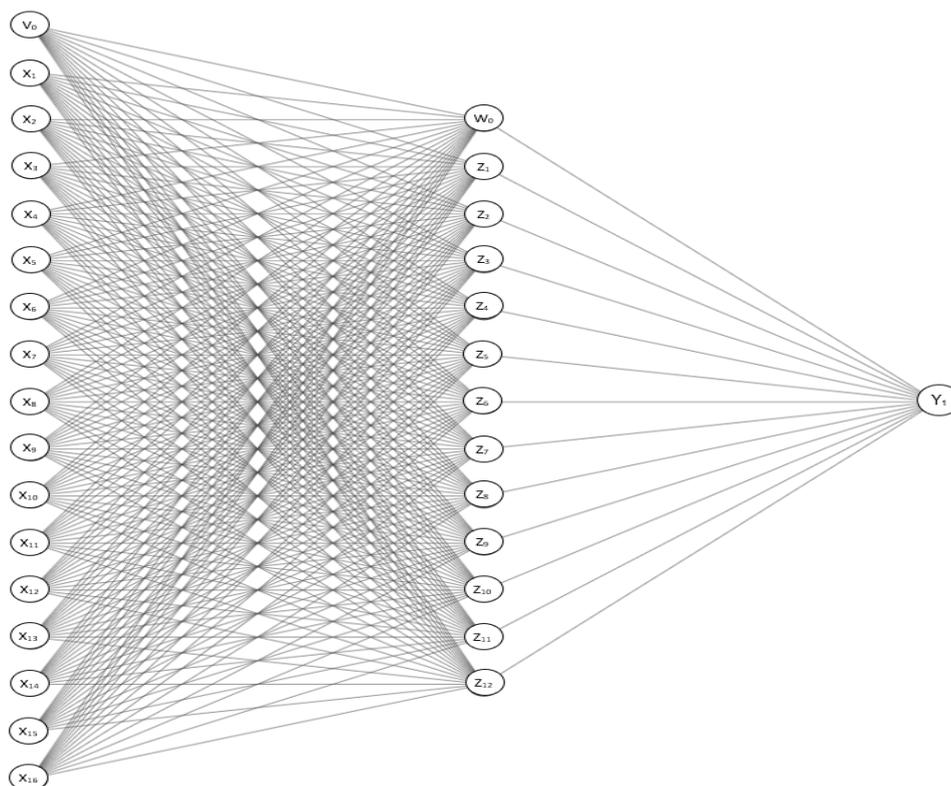
Figure 4: ANN Architecture Forecasting Daily Lodging Rental Prices

The equation for the lodging rental price forecasting model is $Zj = f(V_{0j} + \sum_{i=1}^{m}\sum_{j=1}^{n} X_i V_{ij})$ for the hidden layer, and the equation for the output layer $Yk = f(W_{0k} + \sum_{j=1}^{n}\sum_{k=1}^{p} Z_j W_{jk}$. The values that make up the equation Zj describe the weights on each network of the input variable neurons and the bias in the input layer to the neurons in the hidden layer. Besides that, the value that composes the Yk equation shows the weight of each network of neurons in the hidden layer and one neuron in the hidden layer to the output. The weights formed are represented by each line that makes up the ANN architecture as shown in Figure 4.

Processing for BMN input data also uses network architecture and weights that have been formed in the lodging rental price forecasting model. The resulting output is then denormalized to the initial form of numbers to get a prediction of room rental prices.

Table 2: Prediction Results of BMN Rental Prices for Lodging Rooms

Building name	Type	Number of buildings	Output	Daily Rental Price Prediction (Rp)
Hostel – Agency A	-	4	0.23459138	117.125,17
Hostel – Agency B	A	14	0.14880795	110.862,98
Hostel – Agency B	B	2	0.31053732	122.669,22
Hostel – Agency C	A	3	0.1173982	108.570,07
Hostel – Agency C	B	1	0.19057721	113.912,14
Mess/Guesthouse/Bungalow/ Resting Place – Agency D	-	1	0.31053732	122.669,22

CONCLUSION

The application of the Artificial Neural Network method in forecasting the price of lodging room rentals in the city of Yogyakarta and surrounding areas has resulted in accurate predictions. This method has provided an accurate output with a MAPE value of 1.47%. Prediction of room rental prices in buildings with BMN status in the city of Yogyakarta and its surroundings based on the Artificial Neural Network model that has been formed ranges from Rp. 108,570.07 to Rp. 122,669.22 per day.

Artificial Neural Network modelling for forecasting rental prices for lodging rooms in the city of Yogyakarta and its surroundings has provided accurate results so that it can be developed as an alternative appraisal practice in order to explore the potential for lodging rentals. In its application, the use of the ANN model requires the development of a separate system or application.

In its development, the use of input variables in the application of the Artificial Neural Network model for forecasting rental prices needs to pay attention to the characteristics of the location either geographically, economically, socially, or other characteristics that may have an effect. The prediction results on the BMN rental price for lodging rooms when used to describe the total potential non-tax revenue per certain period of time need to pay attention to the occupancy rate factor.

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ADDRESSING THE ASSESSMENT BIAS IN THE MALAYSIAN LOCAL PROPERTY TAX ASSESSMENT

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Abstract

An assessment bias happens when an assessed property signifies intolerable proportionate between the assessed and market values; reflecting its uniformity within the valuation list and possessing inequity across the group of properties defined by the value. To correct the assessment bias, local government usually revaluates its valuation list. While most other developed countries perform the revaluation whenever the assessment's performance is intolerable, the Malaysian existing law urges the revaluation to be as a quinquennial event. Globally, local assessors use the standard ratio studies promulgated by the International Association of Assessing Officers (IAAO) to measure and evaluate the severity of the assessment bias. Adopting the IAAO standard, this research had performed the ratio studies in Hang Tuah Jaya Municipality for the fiscal year of 2017. The research had revealed a significant assessment bias between the lower-value and higher-value properties and other significant property feature that associated with the assessment bias.

Keywords: Property tax assessment, assessment bias, ratio studies

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INTRODUCTION

The assessment bias (also known as assessment inequity) in local property tax assessment as contended by the International Association of Assessing Officers (IAAO) is demonstrated by the severity of assessment inequity existed in the valuation list (IAAO, 2010, 2013). There are two forms of assessment bias in property tax; the horizontal and vertical inequity. The latter which is more concern amongst scholars and policy makers, is the systematic dissimilarity of property assessments across levels of property groups defined by value, whilst, the former is regarded to the systematic inconsistency of property assessments within the same value of property groups (Birch, Sunderman, & Radetskiy, 2017; De Cesare & Ruddock, 1998; Paglin & Fogarty, 1972; Sirmans, Diskin, & Friday, 1995).

Revaluation of the valuation list is the usual correctional means adopted by most of the local governments in the event of assessment bias. While Malaysia is trivial and ambiguous regarding the severity of assessment bias in her local governments' valuation lists, the Local Government Act 1976 (Act 171) urges them to execute the revaluation on the fifth year from the previous exercise. Nevertheless, majority of the Malaysian local governments possesses lapsed valuation list with age more than five years old which made them susceptible to assessment bias. This research, therefore, endeavours the standard ratio studies promulgated by The International Association of Assessing Officer (IAAO) to explore and measure the assessment bias in the Malaysian local property tax system. However, this research limits its scope to the jurisdiction of Hang Tuah Jaya Municipality due to the limitation of research timeline.

RESEARCH BACKGROUND

In general, performance is a situational analysis of the observed condition towards its targeted condition (Amos, 2019). Comprehend to this notion, the performance of a particular property tax assessment is an analysis of the latter's assessed value to its current market values. By adopting the sale price as a proxy to the market value, the analysis compared the assessed value with the sale price in form of ratio which known as the assessment ratio (Almy et al., 2008) as shown by the following formula:

$$R = A/S$$

(1)

Where, R, the assessment ratio for a particular property is equal to A, the assessed value divided by its S, the observed sale price. Assessors used the ratio studies to analyse the property tax assessment's performance which initially comprises two key observations; the assessment level and the uniformity. With the advance of assessors' practice and standard, the regressive pattern of the

valuation list has been included as the third key observation for the ratio studies (Gloudemans, 2011; Gloudemans & Almy, 2011; D.P. McMillen, 2011). The Standard on Ratio Studies as issued in IAAO (2013) consists three measurements of the key observed principles which are the measurement of overall ratio (assessment level), variability (assessment uniformity) and vertical equity (assessment equity).

The Assessment Level
The assessment level or the overall assessment ratio estimates the common or typical ratio of how the properties are assessed relative to the market value (IAAO, 2013). The process of measuring the overall ratio involves observations of the median, arithmetic mean and the weighted mean of assessment ratio. Gloudemans & Almy, (2011, p. 220) contended the application of weighted mean as to be more appropriate as it accurately "measures the central tendency for estimating the total dollar value of a population of parcels". The following formula mathematically describes the weighted mean,

$$\bar{A}/\bar{S} = \sum A \Big/ \sum S$$

(2)

Where, A, the overall (weighted mean) assessment ratio is equal to $\sum A$, the sum of assessed values divided by its $\sum S$, the sum of observed sale prices. The IAAO (2013) suggested the acceptable assessment level (overall assessment ratio) should fall at the interval of 0.90 to 1.10 for any type of property.

The Assessment Uniformity
The main reason to measure the uniformity is to observe whether the variability of the assessment ratio is in systematic variation or else (IAAO, 2013). The process usually involves observations of the coefficient of variation (COV) and coefficient of dispersion (COD). Gloudemans and Almy (2011, p. 226) urged the COD to be most appropriate tool as it "measures the appraisal uniformity in raw percentage points rather than in relative terms". The following formula mathematically described the calculation of the COD:

$$COD = 100 \times \left(\frac{\sum |(A_i/S_i) - (\widetilde{A/S})|}{n} \right) \div (\widetilde{A/S})$$

(3)

Where, (A_i/S_i) is the assessment ratio of a sample and $(\widetilde{A/S})$ is the median assessment ratio while n is the size of the sampling. Ideally, the low COD signals good uniformity but in reality, the COD's outcome subjects to the

homogeneity of the property class. Therefore, an extremely low COD (less than 5%) shall be cautious with errors or biases in data sampling as it is very exceptional to find a perfect homogenous community. In general, the IAAO (2013) suggested the tolerable range of COD should fall between 5.0% and 20.0% for all type of residential properties.

The Assessment Equity
The aim of evaluating the performance of the local property tax assessment to prescribe the severity of the assessment bias in the valuation list. Commonly, the assessors compute the price-related differential (PRD) to indicate the assessment equity (inequity) in the valuation list (Denne, 2011; Gloudemans, 2011; Gloudemans & Almy, 2011). The PRD is computed by engaging the following formula: -

$$PRD = \left(\overline{A/S}\right)/(\bar{A}/\bar{S})$$

(4)

Where, the PRD is equal to $\left(\overline{A/S}\right)$, the mean assessment ratio, divided by $(\bar{A}/\bar{S})$, the weighted mean assessment ratio. IAAO (2013) suggested that a neutral assessment should have a PRD between the ranges of 0.98 to 1.03. Any result of lower than 0.98 indicates a progressive property tax assessment while any PRD greater than 1.03 would signal a regressive property tax assessment.

Tests of horizontal equity
Though it is not compulsory in the Standard on Ratio Studies, recent researches about the performance of property tax assessment often included the tests of horizontal equity in their analysis. Hodge et al. (2017, p. 5) argued that the anticipation of horizontal inequity always complements the vertical inequity exists. The tests of horizontal equity have a double edge purpose; while to ascertain the existence of the horizontal inequity, the tests also meaningful for determining the factors that influence the performance of property tax assessment. This research has considered the tests of horizontal equity as a part of the research method to evaluate the performance of the property tax assessment and to determine 'property type' as a significant factor that affected the outcome of the performance.

RESEARCH METHODOLOGY
This research is a cross-sectional study that initially involved the data of 1,580 residential properties that were transacted in the year 2017. The study obtained the data from the National Property Information Centre (NAPIC) and restricted them to the Hang Tuah Jaya Municipality's jurisdiction. Eventually, the research

only observed 680 them after completed a systematic process that purposely to eliminate irrelevant data. The following paragraphs will explain about the process accordingly to the stages as exhibited in the Table 1.

Data restrictions

The research imposed a set of data restriction to ensure the sale prices are *bona fide* transactions that comply with the cardinal principles of market value definition (Board of Valuers, 2019; IAAO, 2010b). There were three key issues that required attention when examined the data within the transaction records. Firstly, the partial share transaction between parties involved as it explicitly does not represent the sale price of the whole property per se as adopted in Fleissig (2018) and Hodge et al. (2017) for exclusion of non-market representable sale price. Secondly, the transactions which either party involved is a developer as suggested in IAAO (2013, p. 11), "it is unlikely that the sample is representative … when the sample consists of new construction, first-time sales of improved properties…". Finally, the transactions that involved family members as argued by D. McMillen and Singh (2020) that family-related sale prices often appeared to be lower than the assessed value and might performed as outliers in the ratio studies.

Table 1: Elimination of irrelevant data

NAPIC's Data of Residential Sales in Hang Tuah Jaya Municipality		**1,580**
Data Restrictions Stage		**1,580**
Partial sales	30	
Developer's sales	690	
Family-related sales	9	
Less: Non *Bona Fide* sales		(729)
Data Cross-observation & Similarity Matching Stage		**851**
Unmatched properties	37	
Untraceable	93	
Less: none cross-observed data		(130)
Data Cleaning and Trimming Stage		**721**
Duplication	9	
Lower-boundary outliers (<0.2405)	0	
Upper-boundary outliers (>1.0165)	30	
Less: Questionable data		(39)
Final Sampling		682

Source: Author

Data cross-observation and similarity matching
The primary purpose of the data cross-observation is to collect essential data from the valuation list. It began with the data similarity-matching process to verify that both data set during the cross-observation were identical property. The process should achieve at least three similarities in the property's address, title number, type or name of the owner in both data set of the NAPIC and the valuation list during a single cross-observation. Determining the similarities in the property's address, title number and type are straight forward and simple; if both data were not identical, it was unmatched.

Data cleaning and trimming
Initially, the data cleaning process involved data elimination for duplications and samples that contained missing data. Later, the cross-observed data were examined for outliers trimming as the latter are very sensitive to the analysis and may result in significantly different outcomes. Similar to Hodge et al. (2017), this research had applied the interquartile range (IQR) method to for the outliers trimming; a method that is also recommended by the IAAO (2013). Cornia and Slade (2005) contended the elimination of outliers in the ratio studies as they are susceptible to questionable transactions. By using the IQR method, this research only accepted assessment ratios that lie between the range of 0.2405 (lower-bound) and 1.0165 (upper-bound).

RESULTS AND DISCUSSIONS
Results on the assessment level
As shown in Table 2, all indicators for the assessment level have differential results yet is signalling an assessment level below the ideal percentage of one hundred per cent of the market value. The mean ratio is 0.618, with a standard deviation of 0.137. The median ratio is 0.630, with an absolute average deviation of 0.108, while the weighted mean ratio is 0.604.

Table 2: Results on the assessment level

	Results (n = 682)
Mean (standard deviation)	0.618 (0.137)
Median (absolute average deviation)	0.630 (0.108)
Weighted Mean	0.604

Source: Author

As commended in IAAO (2013), this research has commenced the binomial and chi-square tests to ascertain the probability of the overall ratio is less than 0.90, that is, the lower bound of the acceptable assessment level. The test proportion was set at 0.50 and the use of one-tailed binomial test at 95 per cent confidence level. As shown in Table 3, the binomial test had observed 35

assessment ratios or 5 per cent with values equal to or greater than 0.900. On the other hand, the same test had also observed 650 assessment ratios or 95 per cent with values lower than 0.900. Meanwhile, the chi-square test for testing the assessment level involved the setting of equal probability for Group 1 (assessment ratios equal to or greater than 0.900) and Group 2 (assessment ratios less than 0.900). Both tests have the p-value less than 0.01 and significant enough to determine that the assessment level is below the minimum tolerable assessment level of 0.900.

Table 3: Results for testing the level of assessment

	Results (n= 682)
Assessment ratio ≥ 0.900 (proportion)	32 (0.05)
Assessment ratio < 0.900 (proportion)	650 (0.95)
Binomial test (test proportionate = 0.50)	
z-value	23.626
p-value	0.000**
Chi-square test	
χ^2	560.006
degree of freedom	1
p-value	0.000**

**significant at p-value less than 0.01

Source: Author

Results on the assessment uniformity
The COV and COD in Table 4 indicate the assessment uniformity of all the involved 682 properties in the ratio studies. In general, the indicators suggest low variability of the assessment ratio. The COV for the assessment ratios is 21.3 per cent. Nevertheless, the COD as the most powerful indicator to indicate assessment uniformity is 17.5 per cent which falls within the tolerable range as suggested by the IAAO (2013).

Table 4: Results on the assessment uniformity

	Results (n = 682)
Coefficient of Variation (COV)	21.7%
Coefficient of Dispersion (COD)	17.5%

Source: Author

Validating these indications of the assessment uniformity requires the test of the horizontal equity. Therefore, the later section about the horizontal equity test will present and discuss the results.

Results on the assessment equity
The PRD and PRB, as shown in Table 5, indicate the assessment equity for all the 682 properties. Both indicators suggest a regressive assessment; a negative relationship between the assessment ratios and the values of the properties. The PRD for the ratio studies is 1.043, and it is beyond the tolerable range, as suggested by the IAAO (2013). The result suggests a regressive assessment bias within the valuation list. For robustness of the result, this research has taken two vertical equity models namely of the Price-Related Bias model (PRB) and the classic vertical equity test model also known as the IAAO 1978 model.

Table 5: Results on the assessment equity

	Results (n = 682)
Price-Related Differential (PRD)	1.043

Source: Author

Table 6: Results of the vertical equity model tests

Test Model	Model name (Null Hypothesis)	Results of β_1 (t-statistic)
$Y_i = \beta_0 + \beta_1 X_i + \varepsilon$ $X_i = \dfrac{\ln V_i}{\ln 2}$ $V_i = 0.5SP_i + 0.5\left(\dfrac{AV_i}{\widetilde{AV/SP}}\right)$	PRB ($\beta_1 = 0$)	-0.033** (-3.138)
$AV/SP = \beta_0 + \beta_1 SP + \varepsilon$	IAAO 1978 ($\beta_1 = 0$)	-1.939E-7** (-7.502)

Y = price related bias ratio; V = proxy sale price; AV = assessed value; SP = sale price; β = coefficient estimator; and b = coefficient estimator
**significant at p-value less than 0.01

Source: Author

As shown in Table 6, the PRB test had revealed a statistically significant relationship between the observed dependent and independent variables (β = -0.033, t = -3.138, p = 0.002). The observed independent variable explained 1.4% of the dependent variable, $r^2 = 0.014$. The negative coefficient of the independent variable indicated regressive assessment inequity. Similarly, the IAAO 1978 test had revealed a statistically significant relationship between the assessment ratio and the sale price (β = -1.939E-7, t = -7.502, p = 0.00). The observed sale price explained 7.6% of the assessment ratio, $r^2 = 0.076$. The negative coefficient of the sale price indicated regressive assessment inequity. Therefore, both tests had ascertained the regressive assessment bias in the valuation list.

Results on the horizontal equity test
In order to test the existence of horizontal inequity, the research had engaged the Mann-Whitney on the type of properties as it is often used as a factor in the past researches. The 'property type' has two groups to be observed; strata- and landed-properties. There are three categories of price segregation for the horizontal equity test which of 'RM0-RM180,000', 'RM180,000-RM400,000' and 'RM400,001 and above'.

Table 8: Results of Mann-Whitney test for property type

Statistic	RM0 - RM180,000 (n =228)	RM180,001 – RM400,000 (n=338)	RM400,000 and above (n=116)
U-statistic	7,936.500	5,899.500	35.000
z-value	5.012	2.820	-2.339
p-value	0.000**	0.005**	0.012*

*significant at confidence level 95%
** significant at confidence level 99%

Source: Author

The Mann-Whitney test, as shown in Table 8, had resulted in a significant difference in the assessment ratio between the strata- and landed-type properties for all observed price categories.

Results within the price range 'RM0-RM180,000' revealed a statistically significant difference in strata-type properties (Median = 0.577, n = 72) and landed-type properties (Median = 0.707, n = 156), U = 7,936.500, z = 5.012, p-value = 0.000. As for the 'RM180,000-RM400,000' price range, the Mann-Whitney test revealed a statistically significant difference in apartment-type properties (Median = 0.583, n = 29) and landed-type properties (Median = 0.615, n = 309), U = 5,899.500, z = 2.820, p-value = 0.005. Lastly, the results within the price category of 'RM400,001 and above' revealed a significant difference in apartment-type properties (Median = 0.725, n = 3) and landed-type properties (Median = 0.552, n = 113), U = 35.000, z = -2.399, p-value = 0.012.

In conclusion, the Mann-Whitney test had ascertained the existence of horizontal assessment inequity in the valuation list. For this context, the research suggested there is an assessment bias between strata- and landed properties.

CONCLUSION
The ratio studies had revealed an intolerance assessment level for the residential properties in the valuation list of Hang Tuah Jaya Municipality. The overall ratio is lower than the suggested minimum level of IAAO (2013) and indicating that the Hang Tuah Jaya Municipality under-assessed its taxable residential properties at 60.4 percentage of the market value during the fiscal year of 2007.

Meanwhile, the results of the assessment uniformity are mixed yet the COD, as the main indicator for ratio studies, suggesting a systematic variation of assessment ratio amongst the residential properties in Hang Tuah Jaya Municipality in the fiscal year of 2017. Nevertheless, the horizontal equity test by employing the Mann-Whitney test between strata- and landed-properties in three price range categories had revealed the existence of horizontal inequity.

Further, the results suggested that the horizontal inequity had over-assessed the strata-properties while under-assessed the landed-properties.

The empirical results in the assessment equity test together with the vertical equity tests had ascertained the existence of a regressive assessment bias in the valuation list. In the fiscal year of 2017, residential properties in Hang Tuah Jaya Municipality experienced an assessment bias that was favourable to the higher-value properties.

The existence of assessment bias in a recently established valuation list (less than the five years age maturity) is alarming as the Local Government Act 1971 coerces the revaluation of the valuation list when the latter only reach five years old. With majority of the Malaysian local governments are currently experiencing the revaluation lapse; they are highly susceptible to assessment bias and more severe than Hang Tuah Jaya Municipality was experiencing. Therefore, it is imperative for the Malaysian local governments to evaluate the performance of their property tax assessment and conduct the revaluation of the valuation list if they are signalling assessment bias.

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THE LEGALITY OF A PRIVATE LEASE SCHEME: PULL THE WOOL OVER THE PURCHASER'S EYES?

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Abstract

The developer transferred a 99-year lease to the purchasers in a PLS instead of transferring the property ownership. Upon lease expiry, the property shall be reverted to the owner. In Malaysia, the Housing Development (Control & Licensing) Act 1966 (HDA 1966) regulates that a developer must transfer property ownership to the purchasers. "Build and lease" under the PLS does not comply with the law. This article is a conceptual paper that employs doctrinal research to analyse the legal position of property sale under a PLS and examine its compatibility with the existing law. The Courts' decisions on cases related to a PLS property are analysed to determine the PLS's implication on the purchasers' interest. Ultimately, to safeguard the purchasers, the amendment of the laws is recommended as a legal platform to legitimise the PLS.

Keywords: Private Lease Scheme, freehold land, lessee, ownership, housing accommodations

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INTRODUCTION

A Private Lease Scheme (PLS) was first introduced in 2012 by Iskandar Investment Berhad, a developer that built Medini in Johor Bahru, Johore, a housing accommodation including stratified property (Mohsin 2020). The PLS was initially introduced to prevent foreigners from owning too much land in the state of Johor (Siang 2015). It may be viable to curb the influx of foreign ownership. However, if the scheme's introduction is incorporated into the NLC, it shall apply to all land situated in West Malaysia. As seen by Datuk Chang Kim Loong, the National House Buyers' Association president, the PLS Scheme will only assist the landowners, and no ownership will be granted to the buyers (Loong 2020, Eva 2018). The buyers will forever be lessees, and upon the expiry of the lease, their fate is left to the mercy of the landowner/Lessor (Hussin 2016).

In 2018, the Director-General of Lands and Mines, Putrajaya, intended to support the motion to introduce PLS to the NLC. The proposal introduced a new chapter, 'Register of Private Lease' with *'Sijil Pajakan Persendirian'* in the NLC and the STA. However, the proposal was heavily criticised. In October 2018, Dr A Xavier from the Ministry of Water, Land and Natural Resources replied to a question in Parliament that the public has criticised the introduction of PLS. The Ministry has decided to abandon the Scheme of a PLS. (Parliament, 2019).

The HDA governs that the Sale and Purchase Agreement (SPA) between developer and purchaser is statutorily prescribed under the Housing Development (Control and Licensing) Regulations 1989 (Regulations 1989) either schedule G, H, I or J. In *Sentul Raya Sdn Bhd v Hariram Jayaram & Ors and Other Appeals [2008] 4 CLJ 618*, the judge viewed the regulated contract provided under Regulations 1989 as a construction contract prescribed explicitly by statute where compliance is mandatory. Relating to the purchaser's rights, (Zolkafli et al. 2014) states that the purchasers are entitled to ownership of the property guaranteed under the regulated contract provided by Regulations 1989. In *Economy Development Sdn Bhd v Robert Geoffrey Gooch & Anor [2016] 1 CLJ 893*, the Court decided that the provisions in the SPA are not merely contractual but are in effect statutory provisions. Any collateral contract to exist alongside the SPA violates the law that renders the contract void. In the case of *Loh Tina,* it was held that compliance with Regulation 11(1) of Housing Developers (Control & Licensing) Regulations 1989 (Regulations 1989) in any SPA is clearly and manifestly mandatory. There should be no waiver or modification of any of the provisions of the contract of sale unless there is a certificate in writing granted by the Controller. The Court of Appeal held that HDA was mainly structured to shield unsuspecting purchasers against unscrupulous developers, and the deviation from the regulated contract shall be rendered void. Therefore, it is crucial to analyse the implementation of PLS in Malaysia and how it has affected the rights of purchasers or correctly termed

lessee. In the context of discussions in this paper, when the term "purchaser" is used, it is referred to as "lessee".

RESEARCH BACKGROUND

A lease is defined under Section 5 of the NLC as a registered lease or sublease of alienated land. From this definition, for a lease agreement to be enforceable, it must be registered following the provision of the NLC. The lease transaction shall comply with Chapter 15 of the NLC. The lease period is for a term exceeding three years as according to Section 221 of the NLC. The maximum lease term is subjected to subsection 3 of the provision, which provides 99 years if it is over the whole land lease. Section 221(3)(b) of the NLC only allows a maximum of 30 years over part of the land. Section 228 (1) of the NLC provides that the lessor's discretion to grant the extension upon application for extension is made by the Lessee before the expiry of the lease.

The issue of whether a lease could become a subject matter of transfer is answered under Section 214(1)(c) of the NLC. Under this provision, a lease shall be capable of transfer. However, the transfer of a lease shall be subject to subsection 2(c) of Section 214 of the NLC, which stipulates that the transfer of a lease is subject to the express or implied provisions of the lease. The parties have agreed upon the express provisions of the lease upon entering into the Lease Agreement. At the same time, the implied provisions of the lease are stipulated from Section 230 until 233 of the NLC.

It must be clearly distinguished between the dealings known as a lease under the NLC and the concept of a Private Lease Scheme (PLS). (Salleh, 2010) defines a lease as a conveyance by which a land proprietor grants another person an interest in his land. (Judith, 2019) explains that a lease involves two transactions:

a. A contract creating an in-personam (personal) or non-proprietary right that may need the protection of section 206(3) of the NLC; and
b. An interest in land that gives a legal estate in the land upon registration of a lease for a term above three years.

Briefly, under the lease, both parties have a mutual interest in agreeing to more than three years to enable the Lessee to have interest in land exclusively throughout the lease term. Upon lease registration, the Lessee shall obtain an indefeasible interest under section 340(1) of the NLC. The Lease Agreement is prepared and perfected according to the Law of Contract and Form 15A, a statutory form for registering a lease under the NLC. Preparation and execution of a Lease Agreement will not confer any indefeasible interest over the property until the statutory form is presented for registration at the Land Authority. Most importantly, the Lessee knows from the commencement of the Lease Agreement

that upon expiration of the lease, he has to vacate and hand over the land to the Lessor.

The innovation by the developers inventing a lease sale over the property sold to buyers under the PLS in a strict interpretation under the NLC means a transfer of a Lease that it obtains from the registered owner of the land (Lessor) to the purchasers of the housing project. The developer shall prepare the regulated sale and purchase agreement under the HDA and a Form 14A to transfer the lease from the developer to the purchasers. If not adequately communicated and explained to the purchasers, the meeting of mind under the sale of the property will not be mutual. On the one hand, the developer knows that as a Lessee, over the land it intends to sell to the purchasers is only a transfer of the said lease because the developer's status is only a lessee, not the registered proprietor of the land. On the other hand, the purchasers may get the impression that upon signing the sale and purchase agreement with the developer, they will be vested with the ownership of the said property. Little that they know, their status is only as a Lessee, not as the proprietor of the property that they purchased.

From the above explanation, both situations evolve around an assignment of a lease. However, a Lease under the NLC is conferred upon registration of a lease instrument Form 15A under the NLC. The PLS uses Form 14A to transfer the lease from the developer to the purchasers. The innovation of the PLS is somehow valid and enforceable under the NLC because the Lessee can transfer a lease to another third-party subject to a specific condition provided under the NLC. Section 214(1)(c) of the NLC stipulates that a lease of an alienated land is capable of being transferred. In a nutshell, a PLS is a transfer of a lease from the developer to the purchasers. It is valid and enforceable under the NLC. However, the purchasers should be well-informed from the commencement of the sale that their status remains as a Lessee throughout the 99-year lease since the developer is only a Lessee and not the registered proprietor of the said property.

As the vendor in the sale of the residential building, a developer is regulated by the Housing Development (Control & Licensing) Act 1966 (HDA). The HDA is a comprehensive law governing the housing industry. Parliament passed it with three objectives – one, to check abuses of the then-infant housing industry; two, to regulate the activities of housing developers; and three, to protect house buyers. (Salleh 2001). The HDA imposes on the developers to use the regulated sale, and purchase agreements called Schedule G, H, I and J under the Housing (Control and Licensing) Regulations 1989. For example, under the Schedule H, it is stipulated and to be complied with verbatim by the developer, the developer is required under clause 11(1) to, at its own cost and expense and as expeditiously as possible, apply for subdivision of the said Building to obtain the issue of a separate strata title to the said Parcel under the Strata Titles Act 1985 (STA). It is further required under clause 11(2) that upon the issuance of

the strata title to the said Parcel and subject to the payment of the purchase price by the Purchaser to the Vendor following sub-clause 4(1) and the observance of all the terms and conditions herein provided, the Vendor shall, within twenty-one (21) days, execute a valid and registrable memorandum of transfer of the said Parcel to the Purchaser, his heir or nominee or lawful assign, as the case may be. The developer is NOT allowed to contract out from Schedule H as provided under Regulation 11(1) of the Housing Developers (Control and Licensing) Regulations 1989. A contract of sale and purchase of a housing accommodation together with the subdivided land shall be in the form prescribed in Schedule G. Where the contract of sale is for the sale and purchase of a housing accommodation in a subdivided building, it shall be in the form prescribed in Schedule H. Thus, the primary duty of the developer under the HDA is to sell the property to the purchasers, apply for the subdivided title and upon issuance shall transfer the same to the purchasers. Nowhere in the provisions of the HDA allow the developer to transfer a lease to the purchasers.

In addition to the above, in the 2015 amendment of the Strata Titles Act 1985(STA), a duty is imposed on the developer to apply for the issuance of a strata title within three months after completion of the superstructure stage. The original proprietor should apply for subdivision of the Building to the land office. Such duty is crucial because the failure of the original proprietor to comply with these new requirements would constitute an offence and be liable for a fine of not less than RM10,000 and not more than RM100,000 and/or imprisonment not exceeding three years. There is also a further fine of between RM100 to RM1000 for every day the offence continues. Applying for a subdivided title and transferring it to the purchasers is the prime duty of a developer. A developer under the PLS is only the Lessee. Therefore, transferring a lease to the purchasers inevitably does not align with the duty imposed on the developer under the HDA and STA.

Accordingly, the purchasers who purchased their houses under PLS have indicated dissatisfaction with the scheme by filing court claims against the developers. In *Loh Tina & 6 Ors v Kemuning Setia Sdn Bhd & 5 Ors (and Another Appeal) [2020] 7 CLJ 720*, the purchasers entered Schedule G of the Regulations 1989 for a sale of a property to be built on freehold land. However, some of the provisions were amended without the approval of the Controller of Housing.

The developer contemplated that the Purchasers knew the purchased unit would be of a private leasehold interest under a PLS and not a transfer of ownership. The developer argued that the Purchasers knew that the SPA signed by them was effectively for a 99-year lease with an extension for the second period of a 99-year lease. On the other hand, the Purchasers clarified that they had realised subsequently the material changes made onto the SPA that did not conform with the Schedule G. They then argued that the transfer should be of

freehold interest into their names as what was statutorily provided under Schedule G, rather than a leasehold interest.

It was held by the Court of Appeal that by virtue of Regulation 11(1) of the Regulations 1989, the general rule is embedded in the HDA whereby there shall be no waiver or modification of any of the provisions in the Schedule G unless a certificate in writing had been issued and granted by the Housing Controller as provided under Regulation 11(3) of the Regulations 1989. Suppose it was subsequently discovered that a developer had deviated from the prescribed Schedule G. In that case, the Purchasers are entitled to enforce their rights as if the SPA they had signed had been in its prescribed form without any amendments or modification. The Court of Appeal ordered that the houses and the developer execute and register the Memorandum of Transfer in favour of the Purchasers, as envisioned by the prescribed Schedule G under the HDA.

In *Wong Hang Foh & Ors v Tropika Istimewa Development Sdn Bhd (KL High Court Civil Suit No: WA-22NCVC-120-03/2018)*, the Court decided that the developer had misrepresented the purchasers for transferring a lease instead of a strata title. As the proprietor, Iskandar Investment Bhd had granted the developer a lease on the land for 99 years commencing from April 15, 2013, and expiring on April 14, 2112.

Instead of entering into a sale agreement as provided under Schedule H of the Regulations 1989, the developer and the purchasers entered into a Lease Purchase Agreement dated October 18 2012. The parties have agreed to perfect a lease transfer upon issuing strata titles. The developer was also granted a right to develop the land as a stratified housing development to be delivered within 48 months from the date of the agreement. Whereas the developer should deliver within 36 months from the date of the agreement as stipulated under Schedule G of the Regulations.

The purchasers claimed that the deviation from Schedule h in the terms and conditions stated in the sale agreement amounted to false misrepresentation by the developer. In addition, the developer has failed to comply with existing laws, namely the HDA, Regulations 1989, Strata Titles Act 1985 and NLC. The misrepresentation includes the purchasers registering as the lease's lessee over the strata parcel.

As a result of the misrepresentation by the developer, the plaintiffs incurred losses and damages, which the defendant is liable to pay to the plaintiffs. The developer's amendments that are inconsistent with the terms and conditions as found in the Regulations 1989 shall be invalid and shall not be binding on the plaintiffs.

The trial judge decided that the developer had misrepresented to the purchasers (107 purchasers) that they were entering a Sales and Purchase Agreement (SPA) to purchase the property and not the purchase of the lease. The Judge also granted a declaration sought by the plaintiffs that the sales and

purchase agreement is invalid and contravened the HDA, Regulations 1989, NLC and STA. He also allowed the plaintiffs' relief that the defendant is required to comply and shall be bound by the terms and conditions as prescribed in Schedule H of the Regulations 1989. The developer is ordered to affect a transfer of the purchased parcels in favour of the purchasers and shall pay the plaintiffs Liquidated Ascertained Damages (LAD) for the late delivery of vacant possession. This case is significant in highlighting the primary obligations of the developers under the HDA relating to the sale of residential properties (Abu Bakar 2021). The developer shall comply with obligations imposed by the HDA and not deviate from the Regulations 1989 (Abu Bakar 2021).

METHODOLOGY

This is a conceptual paper that invokes a doctrinal (or "black letter") methodology that refers to a way of conducting research which is usually thought of as "typical legal research". A doctrinal research approach will focus on case law, statutes and other legal sources. It differs from other methodologies in looking at the law within itself. A purely doctrinal approach does not attempt to look at the effect of the law or how it is applied. Instead, it examines law as a written body of principles which can be discerned and analysed using only legal sources. The cases related to the PLS are reviewed to ascertain whether the purchasers who purchased their houses are safeguarded.

RESEARCH QUESTIONS

1. Is the PLS compatible with the existing law that regulates the sale of property by the developers in the housing industry?
2. Whether the PLS safeguard the purchaser's interest?

RESEARCH OBJECTIVES

1. To research the compatibility of the existing legal framework with the sale of property under the PLS.
2. To investigate whether the purchaser's interest is protected under the PLS.

FINDINGS AND DISCUSSIONS

The mechanism of a PLS is based on a lease transfer by a lessee. The land in question must be a freehold land tenure to create a 99-year lease over the land in question. The developer could own the land intended for development, where the developer itself will be the lessor. The developer entered into a lease transaction with the registered proprietor in another situation. The lease shall comply with Chapter 15 of the NLC. The registered proprietor shall grant a 99-year lease to the developer. The developer will become the master lease concessionaries, apply for a subdivision of the land, develop a housing project, and later sell the subdivided plot to the purchasers. Instead of selling the unit and transferring

ownership of the subdivided plot, the developer shall transfer a lease to the end purchaser.

The agreement is a sale of a 99-year lease to the purchasers. The sale agreement shall stipulate the right to renew the lease to avoid disputes. The lessee shall apply for the renewal to the lessor, and it is at the liberty of the lessor to grant renewal of the lease. It should be noted that the renewal is subject to a consideration that the lessee must provide. As a lessee, the end purchaser's right over the land only concerns the Building.

In contrast, under Malaysian land law, it is only a creation of interest in land or possessory rights, not land ownership. The legal implication from the PLS is that the purchaser's interest in the property shall diminish as it is nearing the expiry of the lease. Inevitably, the property's value shall depreciate towards the expiry of the lease.

The theory of property promulgated by John Locke (1632-1704) conceptualised the idea of property as private ownership, independent of Government, derived from labour improving upon nature; thus, by the expenses, the labourer becomes entitled to its proceeds. Property rights are based on utility and efficiency, where they should be allocated to maximise utility regarding the use, possession, transfer and other rights on utilisation of the property. Secondly, to maximise efficiency regarding the use, possession, transfer, and other property rights. Protecting the property is one of the most important constitutional rights that create security at par with citizenship in a state. Protecting property rights inadvertently enables the accumulation of wealth and the achievement of prosperity that provides social and economic stability. It will assist in building society and reflect the rule of law if individuals respect property rights. Besides building the society, property rights function as the ultimate determinant of security of tenure that must be recognised, enforced and guaranteed by the states. Thus, by giving a lesser interest to the purchasers, the PLS fails to safeguard the purchaser's interest and does not align with the theory of property introduced by John Locke.

SUGGESTIONS AND RECOMMENDATIONS

The development of a legal framework is necessary to validate the PLS because the concept is novel and neither the HDA, NLC nor the STA contain provisions that permit the scheme. Without the statute, the PLS is incompatible with the current legal system governing the developers' sales of housing accommodations to buyers. The HDA was put into place to safeguard purchasers' interests from any duplicitous behaviour on the part of developers. As a result, the law is set up to ensure that the developer, who is the vendor, must apply for the issuing of a separate deed of title (for a landed property) and the strata title titles (for high rise and gated property). Additionally, the developer is required to give the buyers the title. The HDA, NLC, and STA govern requests for separate issue documents of

title in the ultimatum. If the developers do not fulfil their obligation satisfactorily, they could face penalties under the law. According to (Nurudin AR et al. 2015 and Nurul Sal Shalbila 2020), the government's policy and regulatory adjustments in the housing sector must be accepted because of their crucial role in the industry's competitive housing industry, especially in the development of stratified properties.

Schedule G and H for landed property and under-construction high-rise structures are the regulated sale agreements that developers should employ and are mainly provided for in Regulations 1989. A completed building on landed property is covered by Schedule I, and a completed high-rise building is covered by Schedule J. According to a firm ruling by the Court of Appeal in *Loh Tina*, changing the standard statutory form of a SPA in Schedule G without a certificate from the Controller approving the change would be illegal and render the transaction void. These four schedules indicate that the sale of housing accommodations and transfer of the property, as mentioned earlier, upon issuance of a separate issue document of titles are the only purposes for which they are included.

PLS requires a specific kind of regulated agreement with distinct responsibilities and obligations for the developers because it is based on a lease-purchase agreement, which represents a lease transfer rather than ownership. The lease-purchase agreement's terms and conditions should specify the rights, liabilities, and duties of both the purchasers and the developers. As a result, the Regulations 1989 should include a new schedule known as a "Lease Purchase Agreement."

The NLC's lease provisions deal with the transfer of ownership of the land from the lessor to the lessee. Sections 230 and 231 of the NLC provision for implicit lease agreements. (Sihombing 2019) emphasises that after a lease has been created and registered with the NLC, the lessee's interests are safeguarded against third parties. Section 340(1) of the NLC guarantees indefeasibility of interest.

A Lease Purchase Agreement under the PLS needs a detailed covenant on the rights of the Lessee to have an extension of another 99-year lease. It shall provide the right to transfer the leased unit. Since these provisions are necessary for a PLS, additional covenants for a lessee under a PLS Scheme should be added to the NLC. Lease Purchase Agreements tailored for a PLS reflect specific lease transactions that should be incorporated into the NLC to protect the purchasers' interest in PLS. The purchasers of the housing accommodations intention are to have exclusive enjoyment of the home that they purchased, and this should be reflected in the transactions. They should be made aware that the lease will expire, and the option is given to renew for another 99 years, subject to a payment agreed by the parties.

In order to further strengthen the Lessee's position under the PLS, a Certificate of Lease is proposed upon registration of the lease, specifically for a lease derived from a PLS Scheme. A Certificate of Lease shall incorporate covenants attached to the certificate indicating that the lease is created and registered by the purchasers of a PLS.

Section 11 of the HDA provides the duty of the government as the Controller to safeguard the interest of the purchaser. For instance, under this provision, when a Minister has reasonable inference that a licensed housing developer cannot meet its obligation, he may, without prejudice to the generality of the powers of the Minister, give directions under section 12. This directive is to safeguard the interests of the purchasers by directing the licensed housing developer to take such steps as he may consider necessary to rectify any matter or circumstance. The Minister may also direct a person to be appointed to advise a licensed housing developer in the conduct of his business. He may also direct a company to assume control and carry on the business of the housing developer upon such terms. Therefore, it is recommended that Section 11 of the HDA be amended to broaden the scope of a controller to protect the interests of lessees under the PLS. It is necessary to ensure that the purchaser's rights under the PLS will be better secured against any dispute.

CONCLUSION
Since the HDA governs the relationship between the Developers and the buyer, a compatible legal framework is essential to the legalisation of the PLS. According to the law, the developer's primary responsibility is to apply for the subdivision of a separate issue document of title and transfer it when the strata title is issued. As a result, a PLS's Lease Purchase Agreement only granted the buyer the rights of a Lessee. As a result, a developer misrepresents the purchaser by using the PLS when marketing residential units. The PLS is not well-suited to the rights under the legal framework unless the current laws are amended.

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PAPER CONTRIBUTION TO RELATED FIELD OF STUDY
This study addresses the legal implication of a PLS in light of the existing legal framework for the sale of property by developers. The suggestions in this research may assist the policymaker in providing a secure system of purchasing property from developers.

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TAXATION AS AN ALTERNATIVE TO ENCOURAGE IDLE LAND DEVELOPMENT

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Abstract

The topic of idle land, especially in agriculture, seems to have a consequence on both agricultural production and land utilization. Malaysia's government normally takes a diplomatic approach to idle land concerns, providing financial assistance, facilities, and agricultural input to urge landowners to develop the idle lands. Actual studies on the global scale, however, indicated that certain countries took a tough stance by implementing the idle land tax. Hence, the aim of the research is to look into nine countries' idle land taxation implementation. Secondary data were analysed using comparative and thematic analysis to examine the key aspects of idle land tax application. The study identified five fundamental aspects that are critical to the application of idle land taxes. Based on these findings, Malaysia now has new options for idle land enforcement that it may adopt in the future if diplomatic strategies no longer have an influence on Malaysia's approaches to overcome idle agriculture land issues.

Keywords: taxation, idle land, development

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INTRODUCTION

In Malaysia, there seem to be four main factors due to the existence of idle land. The first factor is the physical and natural conditions of the soil such as poor weather and natural disasters (Amriah, 2001; Zarina 2016), the lack of or defects in infrastructure, such as the drainage system (Amriah, 2001; Farhana, 2005; Azima et al., 2012; Zarina 2016), the unsuitability of the soil type (Amriah, 2001; Tan 2001; Zarina, 2016) as well as non-strategic and small pieces of land (Pazim 1992; Zarina, 2016). The second factor relates to the economic aspects including speculation about rising land prices (Azima & Ismail, 2011), during the switch to manufacturing, there is a shortage of workers, particularly among the younger generation (Pazim, 1992; Amriah, 2001) and unprofitable agricultural production yields. The third factor refers to social factors especially the attitude of the landowners themselves (Amriah, 2001; Azima, 2007; Hasmida, 2007). One of the aspects that influence landowners' lack of willingness to cultivate their land is their attitude, along with financial constraints, landowner conflicts, sentiments of having to pass their land to heredity, and fears regarding high taxes when the land has been altered to another condition and developed. The fourth factor is the procedure and legal factors such as the difficulty of developing waqf land (Rohayu and Rosli, 2014), Malay Reserves (Sulong and Taha, 2016) and customary land (Abd Hamid et al, 2017). Another aspect of idle land issues is the weakness of the enforcement agency to enforce laws relating to idle land as provided in the National Land Code 1965 seriously (Mohamed Akmal, 2019).

Idle agricultural land has an impact on economic, social and environmental aspects such as no generation of agricultural products to the people and the country which is important to support the agenda of strengthening the country's food security. According to Godfrey (2014), it is a wastage when fertile landowners do not cultivate their land fully until it becomes idle. The issue of dumping idle land needs to be addressed better. Moreover, the agenda for developing idle land to secure the country's food security should be enhanced in consideration of the outbreak of the conflict between Ukraine and Russia as well as the Covid-19 pandemic that impacts the country's reliance on food imports. But the fact is that Nik Mustapha et al., (2013) claim that there is an imbalance in which the development of idle agricultural land is relatively slow compared to the urgent need for sufficient food production.

In reality, the purpose of land ownership for individuals is to ensure that land is developed according to the land use category as stated in the title document. However, certain landowners ignore this purpose and leave the land uncultivated for many years, especially agricultural land. Statistics of idle land data by the Department of Agriculture Malaysia in 2019 show that the total area of idle land is 103,563 hectares as shown in Table 1.

Table 1: Number of lots and area of idle land by State in 2019

Pahang	11,292	29,391
Selangor	4,485	20,058
Negeri Sembilan	5,885	11,324
Perak	4,004	11,013
Johor	4,561	10,098
Terengganu	7,027	7,862
Kelantan	3,690	4,815
Kedah	1,774	2,655
Pulau Pinang	877	2,622
Melaka	1,915	2,332
Wp Labuan	858	1,381
Perlis	14	12
Total	**46,382**	**103,563**

Source: Official portal of Agriculture Department (2022)

In fact, the Malaysian government has given full support to the agenda of developing idle land through government policies such as the National Agricultural Policy (DPN) 1-3 and followed by the National Food Security Policy (DSMN Action Plan) and the latest is the National Agro-Food Policy (NAP) 1.0 and 2.0. In addition, government agencies at the Federal and State Government levels have also implemented various programs and approaches to encourage landowners to utilize agricultural land that has long been abandoned. Among the incentives provided by the government such as capital, agricultural infrastructure, agricultural inputs, advisory, and also technical services to the owner of idle land. Meanwhile, according to the study by Norsuhadah (2011), the settlement of idle agricultural land can be divided into two main aspects, namely the solution from the legal aspect and the urban planning aspect. Solutions from the legal aspect are such land acquisition through the Land Acquisition Act 1960 and the requirements of development plans that have been set out in the Town and Country Planning Act 1976. Meanwhile, in terms of government policies such as the Idle Land Task Force (ILTF), Land Bank, and joint ventures with private developers for the purpose of developing idle agricultural land in suburban areas (Farhana, 2005).

The approaches of encouragement by government agencies to develop idle land have been implemented for a long time. However, current statistics (Table 1) have shown that this approach of impulse cannot have an urgent impact on landowners to develop their idle land and the government needs to spend a lot of money to help restore these idle lands. Since the enforcement of land forfeited is poorly implemented by the authorities (Azima, 2007), this study proposes an alternative to enforcement to address the issue of idle agricultural land by

imposing idle land taxes. The main goal of this study was to examine what is the feasibility of the implementation of taxation on idle land could be implemented in our country. The literature review relies on other countries that have implemented idle land taxes or similar ideas. The goal is to gain a comprehensive understanding of the taxation used by the government in order to urge landowners to develop the land.

RESEARCH BACKGROUND

According to the Department of Agriculture Malaysia's official website, "idle land" is defined as "paddy land or a minimum of 0.4 hectares of land that has not been used for three consecutive years, or land that has been cultivated but has been abandoned for more than three consecutive years". According to Sections 114, 115, 120, and 121, NLC 1965, idle agricultural land is classified as freehold or Temporary Occupation License land that has not been cultivated for three consecutive years (Olaniyi, 2013).

Based on Section 115, NLC 1965, clearly states that one of the implied conditions for agricultural land is that the land must be developed or cultivated within three years from the date of ownership. The land may be forfeited if it is left undeveloped or uncultivated. According to Section 129(4)(c), NLC 1965, agricultural land that has been left idle for a minimum of three years is subject to forfeiture. Therefore, this implied condition must be complied with to avoid the breach of conditions that will cause the land may be forfeiture by the State Authority (Mohamed Akmal, 2019). Section 129 (4) (c) also states that the Land Administrator may take temporary rights to the land as directed by State Authority or in the absence of the direction, make an order declaring the land is forfeiture by State Authority. Although there is a provision in the NLC 1965 that allows land administrators to take action to terminate land ownership because it has not been worked for a certain period, but the enforcement is poorly implemented by State Authority in order to maintain the relationship between the government and the people (Azima, 2007).

The alternative enforcement approach of imposing an idle land tax should be taken into consideration to urge landowners to develop their idle land. Referring to other countries, the tax imposition approach to these idle lands is implemented, such as in Saudi Arabia (Zakaria et al, 2019), Philippines (Lebrilla, 2016), Thailand (Medina, 2020; Fung and Mcauley, 2020a), Grenada (Godfrey, 2014), Cuba (Castro Morales, 2018; González and Alfonso, 2018), India (CWAS, 2020), Cambodia (IPS Cambodia, 2019; Fung and Mcauley, 2020b), South Africa (Mosha, 2010) and Japan (Japan Property Central, 2019).

Malaysia has not yet implemented additional taxes on idle land. Nevertheless, according to Amir Mamat (2019), the Chief Minister of Malacca has proposed to impose higher taxes on idle land in Malacca. However, until now

it has not been implemented yet. Meanwhile, the impact of tax implementation to curb idle land has been seen through its implementation based on other countries. As in Thailand, the imposition of high tax rates on idle land is a catalyst urging landowners to cultivate their land. This can be seen when many landowners in Bangkok plant fruits and vegetables to avoid being taxed by the government (The Nation Thailand, 2020). Among the crops cultivated include lemons, papayas and bananas. The positive impact of this idle land tax is also shared by Partpart and Satrusayang (2020) where two plots of land that were previously left uncultivated, owned by Laemthong Corporation and the Wittayakorn family with an area of 50 rai around Ratchadaphisek are now filled with lemon and banana plants.

In general, there are a number of advantages to taxing idle land. The implementation of an idle land tax not only boosts revenue but also has other significant advantages like reducing speculation and providing as an incentive for real estate transactions to ensure that scarce land resources are utilized more efficiently (Haas and Kopanyi, 2017). In the Philippines, Quezon City Mayor, Joy Belmonte described the imposition of idle land taxes as prompting agricultural activities in urban areas as well as improving food security, especially during this Covid-19 pandemic (Tiangco, 2020). Meanwhile, Sarmiento (2010) lists five benefits of imposing idle land taxes, which are:

i. Ensure that soil is used based on the highest and best use principles.
ii. Encourage landowners to continuously develop and maintain their land.
iii. Reduces the probability of incompetence in urban areas.
iv. Additional revenue for local authorities.
v. Maintain the delivery of government basic services to the affected area.

As a consequence, it is considered that imposing a tax on idle agricultural land could be implemented as an alternative for enforcement action in addressing idle agricultural land issues. In this situation, landowners will be charged taxes if they leave their land to remain idle for the period designated as idle land.

RESEARCH METHOD

A comparative and thematic analysis has been used in the implementation of this study. Secondary data such as circulars, guidelines, journals, official websites of government agencies, print media and electronic media are referred to collecting information on the implementation by countries that impose idle land taxes. This study describes those nine countries that have implemented taxation or penalties on idle land in their country. The nine countries including Saudi Arabia,

Philippines, Thailand, Grenada, Cuba, Karnataka, Cambodia, Bostwana, and Japan were analysed by a comparative approach for the systematic review.

Thematic analysis is a method for identifying, analysing and reporting patterns or themes in data (Braun & Clarke, 2006). In order to discuss the manner of applying the idle land tax, systematic research was conducted using secondary data based on each country in the literature. Thematic analysis was also used to synthesize the study's findings into a summary of how the idle land tax was to be enforced. In the context of this study, the main themes of the imposition of idle land taxes are the definition of taxable land, the goal of imposing idle land taxes, tax rates, and important matters considered in the imposition of idle land taxes. The formation of these themes shows a clearer comparison of the implementation of the countries involved.

FINDINGS
The findings of the study are described in Table 2 which is a comparison of nine countries that impose idle land taxes as an enforcement approach to solving idle land issues in their respective countries.

Table 2: Comparison of idle land taxes implementation by the countries

No.	Country (Name of tax)	Definition of land charged	Taxation's purpose	Rates	Aspects of taxation that are considered
1	Saudi Arabia (White Land Tax)	Plots of vacant or undeveloped land (White Land) in metropolitan areas that are used for residential or commercial purposes.	• Increase the amount of land that has been developed. • Ensure that residential land prices are reasonable. • Curb monopolistic behaviours.	Annual payment of 2.5% of the land value	• This tax execution is enforced under a rule of Implementing Regulation of Idle Land Fees Law. • The specifics of the tax requirements that are subject to taxation • Six criteria are examined when determining the value of a property for taxes purposes. • This tax is carried out in three stages. • There are four strategies that can be implemented to ensure that taxes are applied fairly and that payment dodging does not arise. • This idle land tax will be excluded in a set of situations.
2	Manila, Philippines (Idle Land Tax under	• Agricultural land exceeds 1 hectare, with half of it undeveloped or	• Encourages the most effective and efficient use of land.	• Annual payments range from 0 to 5%, depending on	• Presidential Decree No. 1446 establishes the imposition of this tax.

No.	Country (Name of tax)	Definition of land charged	Taxation's purpose	Rates	Aspects of taxation that are considered
	Real Property Tax)	underutilized (certified by regional agricultural experts). Agricultural area with at least 100 trees per hectare of permanent or perennial plants is not considered idle land. • Non-agricultural land covers more than 1000m2, with half of it unused (certified by territorial valuers). • After subdivision, the residential lot remains undeveloped.	• Avoiding land speculation.	the local authority. • This tax is in addition to the existing property tax.	• There are several situations where this idle land tax will be excluded.
3	Thailand (Land and Building Tax)	Unused land is land that has been abandoned or is not being used in a reasonable manner.	Landowners are urged to cultivate their lands as soon as possible.	For idle real estate that has been vacant for more than three years, the rate is increased by 0.3 percent every three years, up to a maximum of 3%.	Idle land is subject to a considerably higher tax rate than residential and agricultural properties.
4	Grenada (Property Tax)	Agricultural land that has been left idle.	• Agricultural sector production should be increased. • It is not meant to raise national income in any way.	0.2% for idle agricultural land	To avoid being taxed, the owner must submit an application to the Ministry of Agriculture for a land use certificate, which certifies that the land is being used efficiently for agricultural purposes.
5	Cuba (Tax on Idle Land)	Insufficient land used or not producing agricultural products, animals, or forestry is referred to as abandoned land.	• Enhance agricultural output. • Encourage the production of goods from land utilization.	• Stage 1: 180 Cup/ha • Stage II: 90 Cup/ha • Stage III: 90 Cup/ha • Stage IV: 45 Cup/ha	The determined tax rate is influenced by the soil quality aspect.

No.	Country (Name of tax)	Definition of land charged	Taxation's purpose	Rates	Aspects of taxation that are considered
6	Karnataka, India (Property Tax for Vacant Land)	Land that has not been developed on.	-	• Not more than 1000m2 of land (0.1% - 0.5%) • 1000m2 to 4000m2 of land (0.025%- 0.1%) • More than 4000m2 of land (0.01%- 0.1%)	Tax rates are influenced by the amount of undeveloped land area.
7	Cambodia (Unused Land Tax)	An unused area of idle land, including unused property with a vacant building.	• Prevent speculative land purchases. • Increasing economic activity by encouraging the use of land. • Create employment opportunities. • Generate income for sub-national institutions.	2% of the land's market value per square meter.	-
8	Gaborone, Botswana, South Africa (Property Tax)	Agricultural land that has not been developed.	• Prevent land speculation. • Leads to rapid land development.	• Agriculture (developed) represents for 0.20 %. • Agriculture (undeveloped) represents for 0.80%.	-
9	Japan (Property Tax)	Farmland that has not been cultivated	Reduces the amount of farmland that is left idle.	Property tax may be charged at a rate that is 1.8 times higher than the standard valuation rate.	Before being taxed, the owner is ensured of the following: • Tried to develop land or rent it out to others to work on. • Been given advice

Source: Researcher analysis

Based on the analysis from Table 2, there are five main elements as key to the feasibility of the implementation of idle land tax, which are:

i. *Definition of taxable land*

In order to implement idle land taxes, the definition of idle land that will be taxable needs to be detailed to make it easier for the agency to determine whether the land is classified as idle land or not. Lebrilla (2016) stated the confirmation that land was idle or not dependent on the survey done. Therefore, there must be

adjustments between agencies at the national level and the government place to provide an accurate definition of idle land.

ii.   Special idle land taxes or additional taxes
The imposition of these taxes whether specially or in addition to idle land should be enforced by relevant laws. In the context of Malaysia, it is necessary to look at whether this idle land tax is introduced as a new special tax or in addition to land tax.

iii.   The goal of imposing idle land taxes
One of the main goals of the implementation of idle land taxes is to encourage landowners to develop idle land, increase agricultural productivity, reduce speculation, and urge them to cultivate their land through agricultural activities. It is important to have a clear goal in formulating the method of implementing the tax on this idle land so that it is acceptable to the parties involved, especially the landowners.

iv.   Tax rates
The analysis indicates that each country has its own system for determining tax rates. This situation can be seen for example in Cuba, the quality of land will affect the rate of tax payment (González & Alfonso, 2018). Meanwhile, the tax rates in Thailand for the residential and agricultural categories are much lower than the idle land tax rate. Therefore, it is important to set tax rates for the imposition of idle land tax so that it can be adopted by all involved.

v.   Considerations in the implementation of idle land tax
The last element of the analysis from Table 2 is that there are several circumstances that need to be considered before deciding whether an owner really needs to be taxed as a fine for not working on his land or not. For example, in Japan, the efforts made by the owner to work on their land will be reviewed by the Local Agriculture Committee as well as the advisory services. If the owner is still disobedient, then the tax will be imposed on the owner. While in Grenada, the owners will be exempted from idle land tax if they obtain land-use certificates from the Ministry of Agriculture which certify that the land is effectively used for agricultural purposes. In short, consideration is necessary for imposing an idle land tax so that the tax imposed is fair in achieving its purpose.

CONCLUSION
In conclusion, if the land is managed well and efficiently, it can be a valuable resource for a country. Our country, which has a wealth of land resources, must make the best use of the land to maximize economic output. As a consequence,

improvements must be made to ongoing efforts to reform land administration in our country. The issue of a massive number of idle agricultural lands throughout the state is serious for the country's economic growth and food security in the context of this study. Therefore, imposing new taxes on agricultural land is an alternative to enforcing the landowners by not allowing their land to remain uncultivated for an extended period of time instead of land forfeiture by the State Authority. It is clear that the results of the nine countries' implementation of the idle land tax have provided additional information and view on the possibility of Malaysia also can implementing idle land tax as an alternative to encourage idle land development.

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THE POTENTIAL OF ARTIFICIAL ISLAND DEVELOPMENT IN MALAYSIA'S PROPERTY MARKET

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Abstract

Urbanization and increasing quality of life among society had caused increasing demand for artificial island development in most cities in the world. However, claims that the artificial island development project able to offer thousands of jobs for the local population has been refuted as it allows such a vast influx of foreigners also its consequences for the racial status quo. Therefore, this research's objectives were to study the artificial island development potential as a marketing tool to boost property market sales as well as to determine its impacts from public community perspective. Thus, this research adopted quantitative approach along the research process. The results were based on the survey distributed within the Melaka Getaway in Malacca which involving 20 respondents from real estate industry's person as well as 160 respondents from public communities. The results show that majority respondents agreed that artificial island development do influence the market sales of property in its surrounding area. Moreover, in terms of its impact towards the community and buyers', the responses were categorized under four elements namely social, economic, environmental and strategic and geopolitical. The most significant impact was an improvement in quality of life, while the most significant disadvantage was a possible harm to the marine ecosystem. These results will be benefitted to both government and private sectors, public community as well as the researcher to explore a new angle of development.

Keywords: Artificial development, Impact, Property development

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INTRODUCTION

Generally, artificial or manmade is often recognized as a replica or synthetics that is frequently a carbon copy of something natural created by humans. In recent years, there is an emerging trend in the real estate market for artificial island development worldwide (Kavya & Gassi, 2020). Increasing demand for artificial island development can be seen in most cities in developing an urbanization lifestyle. This kind of urban settlement has resulted in economic benefits in coastal locations, including increased transport linkages, economic gains from tourism growth, and increased industry and commerce, while also having adverse effects.

There are several reasons why artificial islands are being developed in the modern-day, vary from residential, industrial, commercial, and strategic interests. According to Serina (2017), residential intents encompass the establishment of dwelling colonies and other means of subsistence on the islands. The industrial objective of the islands is to extract raw coal, oil, and minerals out from the ocean floor, as well as to develop manufacturing and production enterprises. Commercial purposes involve maintaining control over commercial sea routes and straits, tourist and recreational functions and the construction of commercial facilities such as retail malls, seaports, and airports amid the sea. Finally, the strategic purpose entails establishing possible defence installations and controlling activity on the man-made island in order to keep an eye on the neighbours: and exert control over a certain territory.

Artificial island construction is not a recent concept in Malaysia's real estate sector. Nonetheless, as Kheng (2020) stated, for the past few years, there is a pronounced tendency concerning the establishment of large-scale artificial islands. While acknowledging the implementation of land reclamation for decades in the Malay Peninsula, this current rapid phenomenon of the landmass in the sea project indicates rather a new logic of land-based development. Several major cities in Malaysia are actively reclaiming land along coastlines and envisioning urban island cities with aesthetic architecture.

So far, there are three large-scale artificial island-making projects happening in Malaysia. Most recently, the extravagant Penang Transport Master Plan is now on proposing phase to develop Penang South Island that consists of three artificial islands. In the meantime, Johor's Forest City, with close proximity to Singapore, is a new overseas property investment enclave primarily for PRC investors as well as The Melaka Getaway, an integrated deep seaport known as the largest and most ambitious of China's Belt and Road initiatives in Malaysia. Regardless of these projects being initiated for different political-economic reasons and contexts, they are all dependent on the speculative nature of urban development with strong governmental support at the subnational level (Kheng, 2020).

However, in Malaysia, despite the increasing number of artificial island developments in recent years, these projects have always been opposed by the public over an environmental concern. This is because an artificial island development brings more disadvantages to the ecosystem as well as economic issues compared to its advantages in a particular area. The land reclamation will cause damage to the sea creatures and a settlement of deep water during the construction. Moreover, artificial island development is a costly expense, and time-consuming developmental project as well as high engineering skilled workers, specific equipment, and good weather also need to be considered (Faisal et al., 2020).

Therefore, this study is to identify the potential of artificial island development that has been escalating over the years in Malaysia as well as considering its impacts, advantages and disadvantages in terms of the local communities' perspectives.

LITERATURE REVIEW
Artificial Island Development
The term "artificial island" refers to a variety of aquatic constructions that can create a specific habitat for humans, such as piling or floating hydraulic constructions. In a restricted sense, the term "artificial island" refers to land artificially created in the sea. Zheng et al. (2020) stated that the artificial island is a manmade island in the water. The artificial island is described in a limited sense, and there are two methods for constructing an artificial island. One option is to construct the artificial island entirely on its own, while another is to enlarge an existing one or merge many tiny islands to create a certain quantity of land. Around the world, the majority of large-scale artificial islands are situated in East and Southeast Asia, the Persian Gulf, Europe, and the United States.

In recent times, artificial islands have often been built by land reclamation due to the lack of available land for specific development or the country's rising demand for additional habitat or recreational opportunities. They have been constructed more recently to alleviate urban over population, accommodate airports, and encourage tourism. The construction and development of artificial islands for commercial, industrial, residential, and strategic objectives are likely to become increasingly prevalent shortly. Additionally, technological advancements will undoubtedly contribute to raising the frequency of artificial islands. Additionally, suggestions have been made to construct additional islands in order to alleviate coastal erosion or to produce electricity using renewable energy sources. Such initiatives might provide new possibilities and events to a region that previously lacked development potential or was experiencing an area scarcity, as is anticipated to occur in the future.

However, there is a prospect of an artificial island development race, which would surely have a detrimental effect on marine life and biodiversity (Kavya & Gassi, 2020). The design of such a project has several challenges, most notably in terms of its environmental impact. It is vital to consider all of its facets. The airport artificial island, for example, is typically located near the city and is primarily influenced by the air route and surrounding restrictions; the artificial port island, on the other hand, is mainly determined by the economic hinterland of the adjacent land and the cargo transfer function; and the auxiliary artificial island of the cross-sea channel is influenced primarily to the layout of the entire channel (Zheng et al., 2020).

Dimension of developing artificial island
Table 1 below presents several dimensions in developing artificial island namely strategic and geopolitics dimension, economic dimension, and marine and nautical dimension.

Table 1: Dimension of Artificial Island Development

	Details
Strategic and geopolitics	• artificial islands are developed for strategic and geopolitical concerns. They are frequently developed to keep an eye on neighbouring nations and serve as a place for military and defence infrastructure construction. These artificially established islands may be utilised to attack adversarial countries with warships and missiles (Mirasola, 2015).
Economic	• One of the primary attributes of an artificial island is its economical factor which is largely concerned with commercial and industrial activities. Artificial islands are often built for the purpose of researching and exploiting natural resources such as water, coal, petroleum, minerals, and even fisheries products. • Another economic benefit associated with manmade islands in the tourist industry, countries develop artificial islands for tourism attractions. The other economic objective is the development of harbours and runways.
Marine and nautical	- Bueger (2014) claimed that the marine and nautical dimension is also known as "maritime security", is gaining use and significance in international affairs. There is no precise definition or agreement on a marine security term at the moment. - In 2014, regional organisations such as the European Union and the African Union announced the establishment of marine security initiatives. However, the United States

	Details
	is a pioneer in marine security, having established a National Maritime Security Policy in 2004.
	- Between 2008 and 2011, piracy off the coast of Somalia, interstate tensions in the South China Sea and the East China Sea, and governments' expanding military might in their sea bodies have all put emphasis on maritime security in the last few years.

Land Reclamation

Land reclamation is the process of creating artificial land from within a coastal area (Sufian & Mustafa, 2010). Coastal land reclamation, or simply reclamation, is the process of reclaiming uninhabited sea or riverbeds (Ning et al., 2010). Land reclamation is an excellent option that is properly managed in terms of physical, social, and economic growth, all of which contribute to meeting human requirements (Maryati, 2012). Land reclamation enables the expansion of land for human benefit in a number of ways. The majority of land reclamation in Malacca is utilised to create residential areas and commercial or mixed development (Malacca Economy Planning Unit, 2015). This step is taken to fulfil development demand and alleviate population strain. Simultaneously, it can be one of the methods used to attract foreign investment, therefore improving and expanding Malacca's economy. This scenario demonstrates the critical role of coastal land reclamation in ensuring economic sustainability.

Additionally, land reclamation is viewed as a method of creating new unoccupied land. In comparison to mainland growth, this approach is straightforward. Additionally, reclamation was employed to eliminate polluting water regions and to improve the sea's hydraulic characteristics by rearranging the shoreline. Acting as both a fixed asset and a visionary resource for state leaders (as well as local corporate and political rulers) reclaiming land development policy, these island-building projects are intended to bolster national treasury through immediate land sales and long event land-and-property indirect taxes. Most crucially, these game-changing initiatives should be viewed as a new governance instrument capable of sustaining state economic development and the illusory promise of future cities while allowing land-use planning to become more spatial and systemically flexible (Kheng, 2020).

Despite the fact that coastal reclamation dates all the way back to the eighth century, it was not until the 1990s – in response to a thriving economy – that coastal reclaiming became an urban regeneration choice in Malaysia. Since 1988, at most, 31 land reclamation projects have been allowed, as well as the reclamation of whole coasts in federal states like Kedah and Negeri Sembilan and even the development of 18 artificial islands (Chee, 2017).

Legislation for Land Reclamation
Land reclamation is listed in the Town and Country Planning Act 1976's concept of 'development' (Act 172). "The carrying out of any construction, engineering, mining, industrial, or other related operation in, on, or beneath the land, the material alteration of the use of any land or building or portion thereof, or the subdivision or amalgamation of lands; and the term "develop" shall be deemed accordingly". Thus, all land reclamation activities must adhere to the provisions of Act 172 and associated legislation such as the 1965 National Land Code (NLC) and the 1976 Local Government Act (Act 171) (Mohammad et al., 2016).

Malaysia has a comprehensive set of laws and regulations governing land development. The National Land Code (NLC) of 1965, the Town and Country Planning Act 1976 (Act 172), and the Local Government Act 1976 (Act 171) are the primary pieces of law in Malaysia that facilitate related development. In terms of planning, the National Land Code (NLC) 1965 contributes to the standardisation of Malaysia's tenure systems and land concerns, particularly in Peninsular Malaysia. While Act 171 establishes the form, organisational structure, functions, and obligations of local government in general, with a particular emphasis on responsibility for the town and country planning. Act 172 is critical in guiding the establishment of a unified legislation and development system, particularly in the development plan and development control system, and it is aimed to address Malaysia's planning weaknesses.

According to Mohammad et al. (2016), there are several divisions of government and planning administration, depending on the country's government structure. In the majority of countries, the planning administration hierarchy is decided by the level of government. Malaysia's planning administration is divided into three levels: federal, state, and local. Each level has distinct tasks and duties, particularly in terms of physical planning. The Federal Government is responsible for policy creation, planning, execution, coordination, and assessment in order to steer Malaysia's physical development in a positive direction (Town and Country Planning Act 1976 (Act 172), 2014). The State Government is responsible for land matters, whereas the Local Government is in charge of planning, coordinating, and managing the use and development of land and structures under its jurisdiction. A sound planning administration practice aids in the regulation of growth. Implementation by the subordinate planning authority is critical for increasing planning administration efficiency.

Implication of artificial island development
Table 2 below presents several implications in developing artificial island namely economic, social and environmental.

Table 2: Implication in Developing Artificial Island

	Details
Economic	• Coastal cities have reaped the benefits of dense urbanisation, such as improved transportation links, higher tourism revenue, and an expansion in business and industry, but they've also suffered the consequences.
Environment	• The ecosystem has been poisoned, signalling the end of the seabed's existence. The severe pollution caused by noise continues to worsen. • Natural habitats including mangrove forests, seagrass beds, saltmarshes, and mudflats, are rapidly replaced by artificial "biodiversity", including seawalls, rock armour, breakwaters, and marinas, resulting in the loss of precious natural ecosystems and destruction of natural connectivity between terrestrial and marine systems. • By 2030, it is anticipated that up to 12.5 million km2 of ecological species would have been lost, and there is an urgent demand to find strategies to minimise this loss (Chee, 2017). • Excessive growth and building in marine and coastal systems have resulted in a phenomenon dubbed "ocean sprawl." Ocean sprawl degrades or destroys marine ecosystems as a result of the installation of manmade structures, with more severe effects happening in sedimentary ecosystems. • Potential to alter the populations of proximity habitats by changing light availability, velocity, wave energy, sediment and mineral transfer, leaking contaminants, altering predator-prey relations, and causing noise during their building projects (Heery et al., 2017).
Social	• Land reclamation may also result in the loss of a community's livelihood based on its tradition. The land reclamation area might jeopardise the people's connection to the sea, whereby many water festivals were emphasizing the significance of that bond. • Due to the fact that land reclamation prevents seawater from entering, the ritual of carrying saltwater to shower each other has been modified by the usage of tanks of water supply. • Language hurdles are frequently the biggest impediment for villages, with many unable to communicate in English and even fewer able to communicate in Mandarin (for example).

	Details
Strategic and Geopolitical	• To address strategic and geopolitical problems, man-made islands have also been constructed. Military and defence infrastructure is typically built in these areas as a means of keeping tabs on neighbouring countries. It is possible that these manmade islands may be used to launch missile attacks against countries that pose a threat (Mirasola, 2015).

RESEARCH METHODOLOGY
This study has adopted a quantitative approach along the, where is a technique that utilizes quantified data as well as numerical data. The study was carried out within the Melaka Gateway, Melaka. The rationale behind these choices is from the point that the developmental project is a cityscape in which all requisite landscapes are found, relevant artificial island development in the nation is located, and it is accessible. As a result, it is possible to collect all required and pertinent data from the local community regarding the objectives of this study.

In this study, the objectives were answered through the data collected from the local community to determine the artificial island development's impact, and real estate practitioners to determine the potential of artificial island development as a marketing tool to boost property market sales. A total of 200 questionnaires were distributed to the local community, and 30 questionnaires were distributed to the real estate practitioners. Considering that an artificial island development project affecting most people who live nearby and affecting their wellness and well-being due to the development of artificial island projects takes place, the public community who live surrounding there was therefore appropriate.

RESULTS AND DISCUSSION
Response Rate
From the 200 questionnaires were distributed to the local communities within the case study area, only 160 were returned which is resulted 80% response rate. On the other hand, from the 30 questionnaires were distributed to the real estate practitioners, 20 were completely answered and resulted 66.7% response rate. Table 3(a) and Table 3(b) present the tabulation of respondents has been participated in this study.

Table 3(a): Respondents Profile – Real Estate Practitioner

Profile	Frequency (N = 160)	Percentage (100%)
Gender:		
Male	12	60
Female	8	40
Age Group:		
20 – 29 years old	3	15
30 – 39 years old	11	55
40 – 49 years old	3	15
Above 50 years old	3	55
Academic Qualification:		
Certificate / Diplom	7	35
Bachelor Degree	10	50
Master / Doctor Philosophy	3	15
Working experience:		
0 – 5 years	6	30
6 – 10 years	7	35
11 – 15 years	4	20
16 – 20 years	2	10
More than 20 years	1	5
Current position:		
Real estate Agent / negotiator	8	40
Valuer	3	15
Property manager	9	45

Table 3(b): Respondents Profile – Local Communities

Profile	Frequency (N = 20)	Percentage (100%)
Gender:		
Male	77	48.1
Female	83	51.9
Age Group:		
20 – 29 years old	44	27.5
30 – 39 years old	45	28.1
40 – 49 years old	40	25.0
Above 50 years old	31	19.4

Profile	Frequency (N = 20)	Percentage (100%)
Occupation:		
Government sector	37	23.0
Private sector	47	29.4
Self employed	50	31.3
Student / unemployed	26	16.3
Distance from case study area:		
Below 2km	34	21.3
2 km – 4 km	25	15.6
4km – 6km	37	23.1
6km – 8km	27	16.9
Above 8km	37	23.1

The Potential of Artificial Island Development on Property Market from The Real Estate Practitioners' Perspective

From the twenty returned questionnaires from the real estate practitioner who were participated in this study, several responses were compiles. Table 4 below summarises the responses from the respondents.

Table 4: The Potential of Artificial Island Development in The Property Market

Impact	Mean Score
The housing price is higher in the vicinity of artificial island development.	4.31
Artificial island is successfully recognized as a tourism area with potential to attract investors and visitors.	4.24
Artificial island development is the best way to boost property market sales	4.11
The demand of artificial island will be increased due to the scarcity of land demand	3.77
The real estate demand will be boomed in the artificial island area	3.72
Artificial island is needed to overcome the overpopulation issue.	3.48

In general, from the results, the development of artificial island has significant potential towards Malaysian real estate market. The housing price is higher in the vicinity of artificial island development as compared to other places due to several reasons especially increase of development costs.

Furthermore, majority respondents agreed that the artificial island is successfully recognized as tourism centre which are able draw a large number of investors and visitors flock to the region. Malaysia is currently working on three large-scale initiatives to create artificial islands, and the Melaka Getaway is Malaysia's largest and most ambitious Belt and Road venture, with close access to Singapore as well. It doesn't matter why these initiatives were started, since they all depend on the risky character of urban growth and substantial government backing at the subnational level (Kheng, 2020).

Moreover, the development of artificial island is having potential to boost property market sales in future. Since the Gateway is expected to cost RM 42 billion to build and attract 2.5 million tourists yearly, create 40-45,000 jobs, and produce RM 1.19 trillion in revenue for the state of Melaka, this may be accepted as a fact. The Malacca Strait is home to two of Malaysia's most important ports, but Melaka Gateway was previously considered part of a larger port partnership between Kuala Lumpur and Beijing aimed at enhancing bilateral trade as well as shipping and logistic support along China's much-heralded Maritime Silk Road.

The demand of artificial island will be increased due to the scarcity of land demand. Zheng et. al (2020) stated that the artificial island is in fact a man-made structure submerged in the ocean. There are several different types of aquatic structures that may be used to build an artificial island, including pilings and floating hydraulic structures. "Artificial island" refers to land that has been artificially formed in the water. It's possible to build an artificial island from scratch, or to expand an existing one or to join several small ones to form a larger one. Large-scale manmade islands are most often found in East and Southeast Asia, as well as the Persian Gulf and European countries to fulfil the demand of land advancement and betterment.

Respondents also agreed that the demand on real estate is higher within the artificial island vicinity. One of the most common reasons for this is because buyers often reassess how they live, invest, manage their time, prioritise their immediate environment, and participate in themes that are important to them, which is one of the most common reasons for this (Foo, 2020). As Kheng (2020) remarked, there has been a noticeable trend in the development of large-scale artificial islands in the last few years. Land reclamation has been practised on the Malay Peninsula for decades, but the recent fast phenomena of the landmass in the sea project shows a new logic for land-based growth. For economic reasons, several large towns in Malaysia are aggressively recovering land along coasts and planning urban island cities with attractive design.

Respondents also agreed the artificial island is needed to overcome the overpopulation problem. Hence, even more islands might be developed to prevent coastal erosion, or renewable energy sources could be employed to

generate electricity. Such efforts can offer up new chances and events for a place that previously lacked growth potential or faced an area deficit in the future. Take into account all facets of the scenario Artificial islands are impacted by several aspects including the air route and surrounding limits; an artificial port island's cargo transfer function; the cross-sea channel auxiliary artificial island's layout; and the cross-sea channel's economic hinterland (Zheng et al., 2020).

The Impacts of Artificial Island Development from The Community Perspective

In this study, the impact of artificial island is determined by four factors namely economic, social, environmental and geopolitical factor, and were categorized into positive and negative impacts. From the responses by 160 communities within the case study areas, several impacts were gathered as summarises in the Table 5 and Table 6 below.

Table 5: The Impacts of Artificial Island Development from The Community Perspective – positive impacts

Impact		Mean Score
Economic	• To boost property market sales	4.29
	• A key player of tourism	3.96
	• Job opportunities	4.03
	• To accommodate, residential, industrial, and economic activities in the city	3.85
	• To manage and control commercial sea routes and strait	4.06
Social	• Enhancing standard of living	4.34
	• Develop urban lifestyle	4.23
	• To solve overpopulation issue in the city	3.65
	• To resolve unemployment issue	4.15
	• To preserve and improve the wellness of mankind	4.33
Environment	• Initiative of green city	4.22
	• A new ecofriendly surrounding	4.29
	• Operate low energy consumption building	3.15
	• Green architectural and design city	3.69
	• To resolve the rising of sea level	2.41
Strategic and geopolitical	• Betterment and advancement of land	4.15
	• To allocate additional center of government ministry and business	3.99
	• Transport linkage	3.91
	• Designate for maritime security	3.79
		4.12

	• Manage the sea routes and control over the certain territory	

The artificial island is an initiative of Green City. "Smart City," "Healthy City," "Low-Carbon City," "Livable City," and so on are only a few of the many slogans that have formed and established the goal of sustainable urban development, which includes numerous phrases such as "Sustainable City" and "Green City." All of these ideas share the same fundamental presumption and end goal: to achieve optimal growth while using the fewest resources and having the least impact on the environment in order to ensure the well-being of humans and the planet as a whole.

Because of this, the investment in land or real estate development is also described as the investment in making land more usable by humans, dependent on the type of land utilised in specific places and other development features such as residential density (Hui & Yuh, 2016). In addition, Sulhi (2018) stated that the Gateway is estimated to cost RM 42 billion to develop and will draw 2.5 million visitors annually, create 40-45,000 jobs, and generate RM 1.19 trillion for the state of Melaka. In term of the strategic and geopolitical advantages, that artificial island development is able to manage the sea routes and oversee certain territory. This is because a final strategic objective is to monitor the island's neighbours and impose control over a certain area by putting in place probable defensive installations and monitoring activities on the man-made island.

In regards to the negative impacts of artificial island development, Table 6 below summaries the results from 160 respondents participated in this study.

Table 6: The Impacts of Artificial Island Development from The Community
Perspective – Negative impacts

Impact		Mean Score
Economic	• Extreme expensive development costs	4.62
	• Unaffordable property prices in the vicinity of artificial island areas	4.34
	• Local vendor unable to pay leasing fees	4.17
Social	• Impact of current racial dynamics	4.32
	• Limited job offers for local resident	3.86
	• Letting such a large in flow of immigrant and foreigner	4.34
	• Language barriers	3.86
	• The native population lost their livelihood	4.74

Environment	• Damage to the marine environment	4.80
	• Deep water levels are fluctuating while work is done	4.17
	• Artificial "biodiversity" is increasingly replacing natural ecosystems including mangrove forests, seagrass beds, saltmarshes, and mudflats	4.45
	• Severe pollution such as noise pollution, air pollution, solid waste pollution as well as water pollution emerging in the vicinity	4.41
Strategic and geopolitical	• Power instability and political turnover had fallen short of artificial island development expectation	4.52
	• Local strata laws on maintenance fees and assessment tax are difficult to enforce if the owners are away or cannot be identified	4.28
	• Open to harm and insecurity of the region as it away from the mainland	4.16
	• Enforcing the regulations against absentee owners will be challenging	4.03
	• Many mangrove regions have little fishing enclaves and jetties nestled away in the	3.86

From the results, many Malaysians were not affording to own the property in the artificial island vicinity due to the extremely expensive of developmental project costs. Moreover, the artificial island development also contributed to the negative social problem such as the native population lost their livelihood. Apparently, the land reclamation may also result in the loss of a community's livelihood based on its tradition. Peter Gomes, a long-serving community leader, warns out that the land reclamation area might jeopardise the people's connection to the sea.

From the survey, the development of artificial island is identified to harm the marine environment. Likewise, a phenomenon known as "ocean sprawl" has emerged as a result of rapid expansion and construction in marine and coastal areas. The construction of man-made buildings affects or destroys marine habitats, with the most severe consequences occurring in sedimentary environments. Biological variety, fisheries productivity, and their position as major sites of nutrient change all contribute to the social, ecological, and economic relevance of marine sediments as a whole. The impact of coastal expansion on sedimentary environments has, however, been generally overlooked (Heery et al., 2017).

Furthermore, majority respondents were agreed that the power instability and political turnover had fallen short of artificial island development

expectation. The state administration has decided to scrap the Melaka Gateway Port, which was slated to be the region's largest when completed. It has been three years since the reclamation work began for Melaka Gateway, according to a letter to Melaka government from its developer. Legal action has been taken by the developer, however, who alleges that it is being treated unfairly (Hazlin, 2020). As stated by Khairie (2017), one of the most significant difficulties is the enormous cost of upkeep, which is contingent upon owners paying their dues. Due to the fact that the majority of purchasers appear to be investors and non-residents, industry experts point out that enforcing local strata rules on maintenance costs and assessment tax is nearly impossible if the owners are absent and cannot be traced.

CONCLUSION
The aim of this study is to study the artificial island development potential as a marketing tool to boost property market sales as well as to determine its impacts from public community perspective within Malacca Gateway, Malacca. The results show that majority respondents were agreed artificial island development influence the market sales of property in its surrounding area. Moreover, in terms of its impact towards community and buyers' perspective, were categorized under four elements namely social, economic, environmental and strategic and geopolitical. The most significant impact was an improvement in quality of life, while the most significant disadvantage was a possible harm to the marine ecosystem. These results will be benefitted to both government and private sectors, public community as well as the researcher to explore a new angle of development.

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ASSESSING THE IMPACT OF TRANSIT-ORIENTED DEVELOPMENT ON RESIDENTS' QUALITY OF LIFE IN NORTHERN MALAYSIA

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Abstract

Transit-Oriented Development (TOD) is gaining wide acceptance by many state's governments in Malaysia due to its potential to create a liveable neighbourhood with enhanced mobility. Therefore, this study aims to assess the impact of TOD on the residents' quality of life in Malaysia northern states. The data for this study were gathered from a survey on 360 residents who used the Northern KTM commuter train service. Descriptive and inferential statistics including chi-square test and PLS-SEM technique was performed to analyse the data and produce the findings. The findings of this study shown that there were significant differences in travel behaviour patterns (companions, frequencies, and walking durations) with respect to respondents' travel purposes. Moreover, it was revealed that land-use diversity and walkable design as important TOD principles that contribute to their quality of life. The findings of this research would serve as a base but critical information to direct future National Estate Development Plan.

Keywords: Transit-Oriented Development, Quality of Life, 5Ds Principles, northern Malaysia, PLS-SEM

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INTRODUCTION

Transit-oriented development (TOD) is an urban planning concept that emphasised on integrating transport and land use planning in a way that promotes the use of public and active transportation over the use of the private motor vehicles (Curtis, Renne, & Bertolini, 2009; van Lierop, Maat, & El-Geneidy, 2017). The TOD concept was first proposed by an American architect named Peter Calthorpe in 1993 and therefore American cities such as San Francisco and Atlanta became the first to implement TOD projects (Mu & de Jong, 2012). Later on, it gained much attention in European cities. Various cities development with TOD adoption have been reported in London, Copenhagen, Meckenbeuren, and Barcelona (Holloway, 2016; PLANMalaysia, 2018; Woo, 2020). Most recently, Asian governments like South Korea, India, Indonesia, Thailand, Singapore and including Malaysia have begun to adopt this concept into their urban planning policies (Khare, Villuri, Chaurasia, & Kumari, 2021; Niu, Hu, Shen, Lau, & Gan, 2019; Nyunt & Wongchavalidkul, 2020; PLANMalaysia, 2021; Sinaga, Suharyono, Musadieq, & Iqbal, 2020; Tamakloe, Hong, & Tak, 2021).

Although transit-oriented development (TOD) has recently emerged as a trending topic in both urban development agenda and academic studies (Azmi et al., 2021; PLANMalaysia, 2021), most studies did not assess the extent of TOD adoption in a comprehensive manner. For instance, a recent study conducted by Ramlan et al. (2021) solely focussed on "land-use diversity" principle in assessing the extend of TOD adoptions in Klang Valley. Meanwhile, Meng, Li, Taylor, and Scrafton (2021), Huang, Parker, and Minaker (2021) and Dong's (2021) studies primarily emphasised on "demand management" principle in western countries. Therefore, a comprehensive study that evaluates a wider range of TOD principles is needed to assist urban planners and policy-makers in making inclusive decisions regarding TOD strategic planning and policies. Hence, the present study intends to include not just land-use diversity and demand management principles, but also population and employment density, walkable design as well as destination accessibility in evaluating the extend of TOD adoptions and its impact on residents' Quality of Life (QoL).

LITERATURE REVIEW
TOD Principles

The fundamental principles of TOD are diversity, density and design, shortly known as "3Ds" (Calthorpe, 1993). Later, another two Ds namely destination accessibility and demand management were introduced (Cervero & Kockelman, 1997; Ogra & Ndebele, 2014). Table 1 summarises the principles of TOD studied in 20 different academic publications. From these publications it is evident that global TOD's adoption revolves around 5Ds principles which include; 1. Land-use diversity, 2. Population and employment density, 3. Walkable design, 4. Destination accessibility, and 5. Demand management.

Table 1: Common principles of TOD adoption from the literature

No	Authors	Settings	DLU	DST	DSG	DAC	DMG
1.	Yap, Chua, and Skitmore (2021)	Malaysia	X	X	X	X	X
2.	Tamakloe et al. (2021)	Korea	X	X	X		
3.	Ramlan et al. (2021)	Malaysia	X				
4.	Meng et al. (2021)	Australia					X
5.	Khare et al. (2021)	India	X	X	X	X	X
6.	Huang et al. (2021)	Canada					X
7.	Dong (2021)	USA					X
8.	Azmi et al. (2021)	Malaysia	X	X	X	X	X
9.	Staricco and Vitale Brovarone (2020)	Italy	X	X	X		
10.	Sinaga et al. (2020)	Indonesia	X			X	
11.	Nyunt and Wongchavalidkul (2020)	Thailand	X	X	X		X
12.	Jones (2020)	Canada		X			
13.	Jaafar Sidek et al. (2020)	Malaysia				X	X
14.	Ganning and Miller (2020)	USA	X	X	X		
15.	Abutaleb, McDougall, Basson, Hassan, and Mahmood (2020)	UAE	X	X	X	X	
16.	Pongprasert and Kubota (2019)	Thailand			X	X	
17.	Gomez, Omar, and Nallusamy (2019)	Malaysia	X	X	X		X
18.	Appleyard, Frost, and Allen (2019)	USA	X	X	X	X	
19.	Al Saeed and Furlan (2019)	Qatar	X	X	X	X	
20.	Abutaleb, McDougall, Basson, Hassan, and Mahmood (2019)	UAE	X	X	X	X	

*Note. DLU = Land-Use Diversity, DST = Density, DSG = Design, DAC = Destination Accessibility, DMG = Demand Management

Quality of Life

A better quality of life (QoL) is one of the paramount objectives of TOD adoption. A higher density may cause overcrowding and negatively affect the QoL, while mixed land use development may provide conveniences to residents and improve

their QoL. Thus, there may be a trade-off between physical efficiency and QoL. Thus, a successful TOD adoption would not compromise the residents' QoL (Abdullah & Mazlan, 2016). In general, QoL can be viewed as the subjective aspects of well-being (Salvador-Carulla, Lucas, Ayuso-Mateos, & Miret, 2014). Felce and Perry (1995) introduced five domains of well-being namely; 1. physical, 2. material, 3. social, 4. emotional and 5. developmental activity. Each domain encompassed several sub-domains. For example, the physical well-being domain comprised health, fitness, personal safety and mobility. Meanwhile, material well-being domain includes housing quality, privacy, security and neighbourhood. Cross-examination with TOD literatures (Abdullah & Mazlan, 2016; Appleyard et al., 2019; Renne, 2007) revealed that only "neighbourhood" and "mobility" are matched with indicators that reflect benefits of TOD adoption for the residents. Thus, the present study assessed the impact of TOD adoptions on residents' QoL in terms of "neighbourhood" and "mobility".

Neighbourhood. In this study, quality of life from the neighbourhood aspect is perceived as residents' well-being with regards to living conditions and atmosphere in their residential areas that are located nearby railway stations. Indicators such as well-maintained neighbourhood, provision of adequate public facilities, pollution-free, crime-free, less traffic congestion, cost of living and affordable housing were adapted from several previous studies (Abdullah & Mazlan, 2016; Appleyard et al., 2019; Niles & Nelson, 1999; Yap & Goh, 2017) especially from Renne's (2007) work.

Mobility. On the other hand, quality of life in terms of "mobility" is viewed as ease for residents who lived nearby railway stations to move within the neighbourhood and reach other destinations outside of the neighbourhood. Indicators including walkability, safety, well-served public transport, incurred travel expenses and travel time consumption adapted from the same sources as "neighbourhood" aspect were used to measure the mobility dimension.

METHODOLOGY
Sampling Process
This study conducted a cross-sectional survey to gather the research data. The survey targeted residents who used KTM Commuter Northern Sector train service. There are 20 railway stations under the management of KTM Commuter Northern Sector (see Appendix A). Nevertheless, the full record (i.e., directory) of every resident and retailer among the target population was not accessible by the research team because it is a confidential data protected by the federal government for Malaysian citizen privacy. Hence, there is no legit sample frame (i.e., directory) that can be used to randomly draw out the research samples from the target population.

Alternatively, this study adopted purposive sampling to draw out the research samples from the target population. Purposive sampling is a non-

probability sampling design in which the required information is gathered from specific groups of subjects on some rational criteria (Sekaran & Bougie, 2016). Although non-probability sampling is often criticised for its ability to generalise the finding to the target population, in reality it is more likely appropriate in fieldwork research (Bryman & Bell, 2015). Specifically, studies with humans as subjects are less likely to involve random samples (Polit & Beck, 2010) and is actually problematic and unfit for social science studies (Krause, 2019). In fact, carefully controlled non-probability sampling (i.e., purposive sampling) can provide valid and meaningful results (Cooper & Schindler, 2014; Memon, Ting, Chuah, & Cheah, 2017). Hence, this study purposely select passengers who ride trains that operate under the management of KTM Commuter Northern Sector.

Recent literatures on sample size determination for survey research strongly recommend researchers to compute minimum required sample size based on statistical power analyses (Hair, Risher, Sarstedt, & Ringle, 2019; Memon et al., 2020). On that account, the research team adopted Cohen's (1992) rule of thumb to determine minimum sample size required for this study. Cohen's (1992) rule of thumb determines required sample size by the means of power analyses based on the largest number of predictors in a regression-based model (i.e., maximum number of predictors pointed at a particular variable in a research model). In this study, the number of total sample size required for a regression-based model with five predictors; 1. Diversity, 2. Density, 3. Design, 4. Destination and 5. Demand is 147 respondents (see Appendix B). Meanwhile, other parameter settings ($f^2 = 0.15$, $\alpha = 0.05$, and power of 80%) were determined based on default behavioral science criteria as denoted by Hair, Hult, Ringle, and Sarstedt (2017).

Data Collection Procedures

The survey was conducted using self-completed questionnaire forms. A self-completed questionnaire is a survey instrument in which each respondent reads and answers the same set of questions in a pre-determined order without the presence of the researcher (Saunders, Lewis, & Thornhill, 2016). The questionnaire form consisted of three parts; Part A: General Information, Part B: Travel Behaviour Patterns, Part C: TOD Principles and Part D: Residents' Quality of Life. Part A and Part B used combination of nominal scale and open-ended questions. Meanwhile, both Part C and Part D employed 5-points interval scale. For Part C, the scale was labelled as; 1 (unimportant) and 5 (very important). On the other hand, the scale was labelled as; 1 (strongly disagree) and 5 (strongly agree) in Part D.

The survey forms were distributed to the target respondents through drop-and-collect approach because it is easy, fast, and has high possibility to acquire 100 percent response rate (Fraenkel, Wallen, & Hyun, 2012; Sekaran & Bougie, 2016). Two enumerators were assigned for the data collection purpose.

The enumerators rode the train from Padang Besar station to Butterworth station during peak hours to distribute and recollect the survey forms. Respondents were approached while they are commuting the train. A brief explanation regarding the study was given to the respondents prior to leaving the survey form to them to be answered. Their consent to participate was also asked during the briefing. The survey forms were recollected before the respondents were getting-off from the train.

The survey targeted the commuter passengers instead of residents who live nearby the station areas due to the following rationals:

1. It is not ethical to invade people's privacy by knocking on their doors and ask them to participate in the survey.
2. Not all stations are located nearby residential areas (i.e., within 800-m buffer distance).
3. The survey is more likely to receive lower response rate due to refusals or incomplete responses. It is easier for respondents to avoid the enumerators when they are at homes.
4. Chances to acquire eligible respondents are higher since most passengers are the regular customers of KTM commuter service. The result of preliminary study also revealed that not all people that linger at and nearby the station areas have actually ride the train and aware about the facilities and surroundings at the railway station. Some of them were there just to fetch or send their family members or friends at the station.
5. Respondents will have more time to complete the survey while in they are in the journey to their respective destinations. If the survey forms are distributed at the station areas instead of on the train, the target respondents tend to refuse from participating or return incomplete survey forms because they might be in a rush to catch the train or leave the station areas.

ANALYSES AND FINDINGS
Survey Responses and Data Screening
This study had gathered a total of 440 responses within a week of data collection period. From these 440 responses, 407 were from residents who used the KTM Commuter Northern Sector train service. However, some of the respondents were excluded from the analysis due to incomplete responses and straight-lining responses. All related information about the survey responses was summarised in Table 2.

Table 2: Survey responses information

No	Information	Total
1.	All responses	407
2.	Incomplete responses	4
3.	Straight-lining responses	43
4.	Total eligible responses	360

Table 2 revealed that there were 43 residents who responded to the questionnaire with straight-lining answers. Straight-lining answers can be considered as suspicious responses that are probably posited by unengaged respondents (Hair et al., 2017). Hence, these kinds of responses need to be excluded from the analysis. Altogether, there were 360 residents who served as eligible respondents and valid samples for this study.

Demographic Information
Demographic section in the survey form for residents requested the respondents to provide information regarding their; 1. gender, 2. age, 3. race, 4. highest education level, 5. household income, 6. job sector, 7. home ownership status and 8. travel purpose.

Table 3: Background of the respondents

	Information	Frequency (n = 360)	Percentage
1.	**Gender**		
	Male	192	53.3
	Female	168	46.7
2.	**Generations (age range)**		
	Gen Z: 9 to 24 years old	141	39.2
	Gen Y: 25 to 40 years old	161	44.7
	Gen X: 41 to 56 years old	49	13.6
	Baby boomers: 57 to 75 years old	9	2.5
3.	**Race**		
	Malay	317	88.1
	Chinese	16	4.4
	Indian	21	5.8
	Others	6	1.7
4.	**Highest Education Level**		
	UPSR / PMR / SPM	76	21.1
	STPM	12	3.3
	Diploma	108	30.0
	Bachelor Degree	141	39.2
	Others	23	6.4

Table 3 (continue)

	Information	Frequency	Percentage
5.	**Household Income Group (MYR range)**		
	B40: 4,850 and below	270	75.0
	M40: 4,851 to 10,970	78	21.7
	T20: 10,971 and above	12	3.3
6.	**Job Sector**		
	Private company staff	138	38.3
	Government servant	89	24.7
	Self-employed	48	13.3
	Retiree	4	1.1
	Students	76	21.1
	Homemaker	5	1.4
7.	**Home ownership status**		
	Self-owned	107	29.7
	Rental	107	29.7
	Family-owned	146	40.6
8.	**Travel Purposes**		
	Working	192	53.3
	Leisure (e.g., shopping trips, vacations, visiting family or friends)	168	46.7

Table 3 summarised demographic information of the respondents. Male respondents dominated the sampled data (51.1%). Majority of the respondents were Generation Y (44.7%), followed by respondents in the age group of Generation Z (39.2%). Meanwhile, with respect to race, Malay respondents were the majority (88.1%). There were only small percentage of Chinese (4.4%), Indian (5.8%) and other ethnics (1.7%). This data almost consistent with the actual proportion of ethnics in Malaysia's total population.

Next, in regards to education level, majority of respondents were those who received higher education. They were either bachelor degree graduates (39.2%), diploma holders (30.0%). In fact, there were also few respondents who had a master's and doctorate degrees in the sampled dataset which were classified under "Others" category. Despite being highly educated, most of the respondents came from B40 household income group (75.0%).

According to job sector classifications, majority were working for private companies (38.3%). There were also fair proportions of government servants (24.7%) and students (21.1%). The percentage of respondents who possessed their own house and lived on a rental basis were equal at 29.7%. Meanwhile, the majority lived in family-owned house (40.6%). Finally, respondents who rode the train mainly for working purpose (53.3%) dominated the dataset compared to those who used the train service for leisure purposes (46.7%).

Travel Behaviour Patterns

Before testing the causal relationships between TOD adoption and QoL, it is imperative to examine the patterns of travel behaviour of the respondents. Different travel behaviour patterns across diverse respondents' background might lead to variations on how they would perceive outcome of the TOD adoption (Jaafar Sidek et al., 2020; Renne, 2008). These variations would complicate researchers to conclude the finding of causal relationships between independent variables (TOD principles) and dependent variables (neighbourhood and mobility). Therefore, Pearson's chi-square test (χ^2) was employed to justify if any significant variance in the travel purpose with respect to demographic subgroups was evident.

Table 4: Cross tabulation between respondents' demographics and travel purposes

Demographics	Subgroups	Frequency		χ^2
		Work	**Leisure**	***p*-value**
Gender	Male	126	66	.001
	Female	66	102	
Generations	Gen Z	29	112	.001
	Gen Y	116	45	
	Gen X	42	7	
	Baby boomers	5	4	
Race	Malay	177	140	.002
	Chinese	2	14	
	Indian	12	9	
	Others	1	5	
Highest Education Level	UPSR / PMR / SPM	36	40	.025
	STPM	8	4	
	Diploma	52	56	
	Bachelor Degree	77	64	
	Others	19	4	
Household Income Group	B40	122	148	.001
	M40	59	19	
	T20	11	1	
Job Sector	Private company staff	106	32	.001
	Government servant	73	16	
	Self-employed	13	35	
	Retiree	-	4	
	Students	-	76	
	Homemaker	-	5	
Home ownership status	Self-owned	83	24	.001
	Rental	47	60	
	Family-owned	62	84	

Overall, it could be concluded that there were significant differences in travel purposes with respect to demographic subgroups at $p < 0.05$. Hence, it was evident that the data for residents' sample group was not homogenous and varied according to travel purposes. On that account, the analysis for testing causal relationships between TOD principles and QoL need to be performed separately according to category of travel purposes.

The Relationships between TOD Principles and QoL Dimensions
The relationships between TOD principles and QoL dimensions namely neighbourhood and mobility were assessed using PLS-SEM technique. PLS-SEM is a variance-based statistical analysis technique for estimating structural equation models (Hair et al., 2017). Typically, Malaysian researchers use SmartPLS software as a tool to conduct PLS-SEM analysis because there are lots of training and technical support available for this software. The research team of this study also used the same software, namely SmartPLS version 3.3.9 (Ringle, Wende, & Becker, 2015). This study used PLS-SEM technique to fulfil the second research objective because it is among the best statistical analysis to predict causal relationship between two or more latent variables (Hair, Ringle, & Sarstedt, 2011; Šiška, 2018).

In general, PLS-SEM analysis involves two stages of assessment namely; 1. measurement model, and 2. structural model. The purpose of measurement model assessment is to evaluate the validity and reliability of constructs (latent variables) being studied. Meanwhile, structural model is performed to test the significance of hypothesised relationships between constructs (Hair et al., 2019). Altogether, there were two sets of PLS-SEM models; 1. travel for working, and 2. travel for leisure, established to estimate the impact of TOD adoption on respondents' QoL. As discussed in the literature review section, QoL for residents' view was operationalised in terms of Neighbourhood (QLN) and Mobility (QLM) qualities, while TOD adoptions were operationalised in terms of 5Ds principles; 1. Land-Use Diversity (DLU), 2. Density (DST), 3. Walkable Design (DSG), 4. Destination Accessibility (DAC), and 5. Demand Management (DMG).

Measurement Model Analysis
Measurement model analysis in PLS-SEM includes the assessments of; 1. composite reliability, ρ_c coefficient to indicate internal consistency, 2. average variance extracted (AVE) statistics to measure convergent validity, and 3. HTMT ratio to justify discriminant validity (Hair et al., 2019). As a result, all measurement model assessment criteria were passed after deletion of few items. All constructs demonstrated composite reliability, ρc more than 0.7 (Gefen, Straub, & Boudreau, 2000), AVE more than 0.5 (Fornell & Larcker, 1981), and

HTMT ratio below 0.85 (Kline, 2015). Summary of measurement model results for both travel purposes was attached in Appendix C.

Structural Model Analysis

To assess the significance of relationships between constructs in the structural model, values such as *t*-statistics and *p*-values were observed (Mandhani, Nayak, & Parida, 2020; Zhang, Liu, Lu, & Xiao, 2019). Meanwhile, path coefficients, *β* were assessed to indicate the direction of the relationships being studied (negative or positive relationships). A significant relationship should demonstrate *t*-statistics more than 1.65 ($t > 1.65$), for one-tailed test (Hair et al., 2019). All structural model results were illustrated in Figure 1 (work sample group) and Figure 2 (leisure sample group).
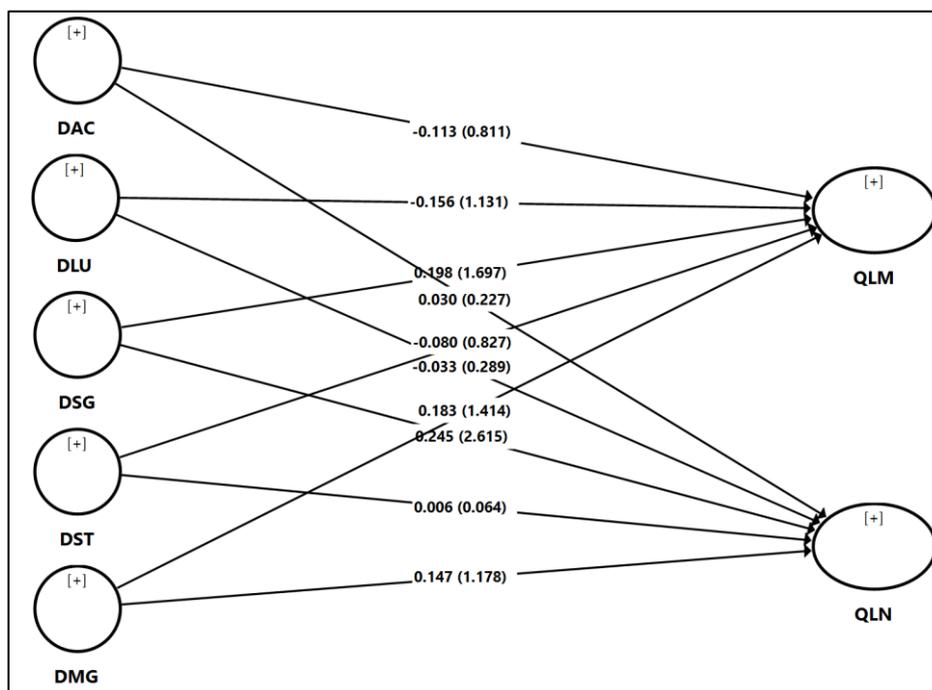
Figure 1: Structural model (work sample group, n = 192)

Note. DLU = Land-use diversity, DSG = Walkable design, DST = Density, DAC = Destination accessibility, DMG = Demand management, QLM = Quality of life: Mobility, QLN = Quality of life: Neighbourhood.
*Values inside brackets represent t-values. Values outside brackets represent path coefficients.

Results presented in Figure 1 revealed that only two relationships were significant. DSG showed significant and positive relationships with both outcome variables, QLM ($\beta = 0.198$, $t = 1.697$) and QLN ($\beta = 0.245$, $t = 2.615$). The results were implying that only walkable design has a positive impact on residents'

neighbourhood and mobility qualities from the viewpoints of respondents who rode the train for working purpose.
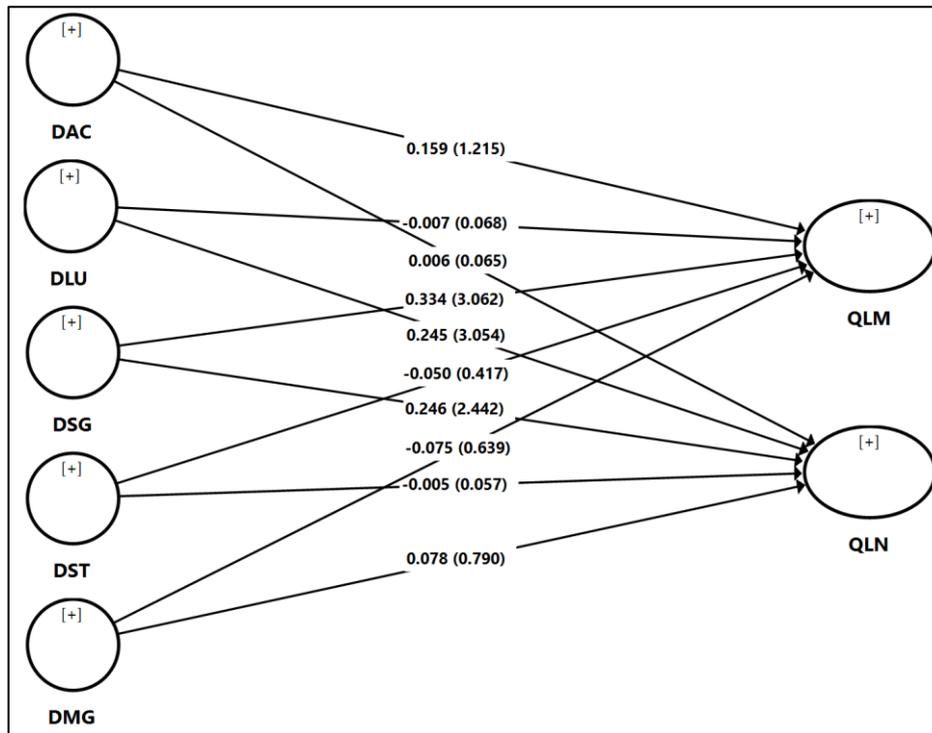
Figure 2: Structural model (leisure sample group, n = 168)
Note. DLU = Land-use diversity, DSG = Walkable design, DST = Density, DAC = Destination accessibility, DMG = Demand management, QLM = Quality of life: Mobility, QLN = Quality of life: Neighbourhood.
*Values inside brackets represent t-values. Values outside brackets represent path coefficients.

In comparison to structural model of travel for working purpose, there were three significant relationships for leisure sample group structural model. In the same vein, DSG showed significant and positive relationships with both outcome variables, QLM ($\beta = 0.334$, $t = 3.062$) and QLN ($\beta = 0.246$, $t = 2.442$). Another significant relationship found in the leisure sample group structural model was between DLU and QLN ($\beta = 0.245$, $t = 3.054$). The results were implying that both land-use diversity and walkable design had a positive impact on residents' neighbourhood quality from the perspective of travel for leisure sample group. In addition, leisure sample group also demonstrated that walkable design had a positive impact on residents' mobility quality.

DISCUSSION AND CONCLUSION

Until recently, the impact of TOD adoption on communities' QoL was left untested in the academic studies. Existing studies had reported positive impact of TOD adoption on household transportation expenditures (Dong, 2021), positive impact of transit-oriented shopping mall developments on train ridership (Abutaleb et al., 2020) and positive relationship between TOD adoption and ridership demand (Nyunt & Wongchavalidkul, 2020). Although QoL was perceived as the benefit gained from TOD adoption in previous studies (Abdullah & Mazlan, 2016; Appleyard et al., 2019; Gomez et al., 2019; Yap et al., 2021), none of the study statistically test the relationship between TOD adoption and QoL.

On that account, the present study had produced a novel empirical evidence that portrayed the impact of critical success factors of TOD adoption on residents' QoL in the form of content neighbourhood and ease of mobility. PLS-SEM analysis performed in the present study demonstrated significant positive effects of "walkable design" principle on both QoL dimensions, for residents who travel to work. Additionally, residents who travel for leisure purpose also revealed a positive relationship between "land-use diversity" principle and neighbourhood. Besides residents' perspectives, the present study also considered the retail operators' viewpoints in estimating the impact of TOD adoption on QoL.

To the best of our research team's knowledge, statistical results that verify the impact of critical success factors of TOD adoption on communities' QoL was reported for the first time in the present study. Though direct comparisons with previous empirical studies were not relevant due to differences in operationalisation of TOD success factors and QoL dimensions being studied, current finding offered a novel empirical evidence by operationalising TOD adoption based on its development principles (i.e., 5Ds) and testing QoL as its outcome variable. Current finding also supported notions of prior scholars who viewed QoL as the benefit realised from TOD adoption (Abdullah & Mazlan, 2016; Appleyard et al., 2019; Gomez et al., 2019; Yap et al., 2021). Albeit statistical evidence from this study verified that not all TOD principles would affect QoL of the studied community, it highlighted factors that are truly critical (i.e., walkable design and land-use diversity) in ensuring TOD adoption brings benefits to the community.

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APPENDICES

Appendix A: KTM Commuter Northern Sector Stations

No.	Station Names	No.	Station Names
1.	Padang Besar	11.	Bukit Mertajam
2.	Bukit Ketri	12.	Bukit Tengah
3.	Arau	13.	Butterworth
4.	Kodiang	14.	Simpang Ampat
5.	Anak Bukit	15.	Nibong Tebal
6.	Alor Setar	16.	Parit Buntar
7.	Kobah	17.	Bagan Serai
8.	Gurun	18.	Kamunting
9.	Sungai Petani	19.	Taiping
10.	Tasek Gelugor	20.	Padang Rengas

Appendix B: Sample size determination based on Cohen's (1992) rule of thumb

Exhibit 1.7 Sample Size Recommendation a in PLS-SEM for a Statistical Power of 80%											
	Significance Level										
Maximum Number of Arrows Pointing at a Construct	1%				5%				10%		
	Minimum R²				Minimum R²				Minimum R²		
	0.10	0.25	0.50	0.75	0.10	0.25	0.50	0.75	0.10	0.25	0.50	0.75
2	158	75	47	38	110	52	33	26	88	41	26	21
3	176	84	53	42	124	59	38	30	100	48	30	25
4	191	91	58	46	137	65	42	33	111	53	34	27
5	205	98	62	50	147	70	45	36	120	58	37	30
6	217	103	66	53	157	75	48	39	128	62	40	32
7	228	109	69	56	166	80	51	41	136	66	42	35
8	238	114	73	59	174	84	54	44	143	69	45	37
9	247	119	76	62	181	88	57	46	150	73	47	39
10	256	123	79	64	189	91	59	48	156	76	49	41

Source: Cohen, J. A power primer. *Psychological Bulletin*, 112, 155–519.

Source: Adopted from Hair et al. (2017)

Appendix C: Full results of measurement model assessments

Constructs	Code	Items	Factor Loadings	
			Work	**Leisure**
DLU	DLU01	Residential area development	.787	.706
	DLU02	Commercial area development	.825	.872
	DLU03	Institutional area development	.730	.827
	DLU04	Industrial area development	.874	.807
DSG	DSG01	Pedestrian walkway with roof	.755	
	DSG02	Pedestrian walkway with safety feature	.763	.663
	DSG03	Pedestrian walkway connected to surrounding establishments	.695	.666
	DSG04	Pedestrian walkway connected to bus and taxi stations	.741	.715
	DSG05	Pedestrian walkway with shaded trees	.707	Deleted
	DSG06	Pedestrian walkway that PWD-friendly	.684	.671
	DSG07	Streets with adequate intersections to provide good connectivity	.760	.816
	DSG08	Streets with dead-ends to limit private vehicles passing through station areas	.717	.752
	DSG09	Streets with adequate wayfinding	.727	.721
DST	DST01	Population density	.873	.838
	DST02	Employment density	.884	.922
	DST03	Urban density	.842	.801
DAC	DAC01	Various transportation choices in proximity	.564	.847
	DAC02	Various bus service operators	.835	.867
	DAC03	Availability of bus stop in proximity	.830	.861
	DAC04	Located near highway exit / entrance	.756	.688
DMG	DMG01	Park-and-ride building	.649	.703
	DMG02	On-land car park	.665	.754
	DMG03	Parking spaces for bicycles	.589	.674
	DMG04	Municipal / public service facilities	.758	.814
	DMG05	Retail services	.833	.794
	DMG06	Located nearby landmarks	.860	.735

Note. DLU = Land-use diversity, DSG = Walkable design, DST = Density, DAC = Destination accessibility, DMG = Demand management

Constructs	Code	Items	Factor Loadings	
			Work	Leisure
QLM	QLM01	My neighbourhood is well served with public transport.	.609	Deleted
	QLM02	The use of public transport saves my travel expenses.	Deleted	.750
	QLM03	The use of public transport saves my travel time.	.480	.759
	QLM04	Many residents of my neighbourhood prefer to use public transportation rather than their own vehicles.	.723	Deleted
	QLM05	My neighbourhood is easy to walk around.	.690	.658
	QLM06	I can easily walk to the train station from my house.	.796	Deleted
	QLM07	I feel safe from traffic (road) accidents while walking / cycling.	.797	Deleted
	QLM08	It is easy to cross the street in my neighbourhood.	.839	Deleted
	QLM09	The provided pedestrian walkways are always in good condition.	.782	.738
	QLM10	Most drivers give way to pedestrians crossing the road.	.718	.631
QLN	QLN01	Comfort and better place to live than other areas.	.669	Deleted
	QLN02	Well-maintained from time to time.	.754	.720
	QLN03	Free from any pollution	.751	Deleted
	QLN04	Free from traffic congestion.	Deleted	Deleted
	QLN05	Free from social problems and crime cases	.685	Deleted
	QLN06	Has a good road facility	.711	.695
	QLN07	Has many public spaces for recreation	.704	.744
	QLN08	Has access to many employment opportunities	Deleted	Deleted
	QLN09	Well-provided with community facilities	.713	.663
	QLN10	Has strong sense of community	.741	.768
	QLN11	Can shop complete daily necessities	Deleted	.763
	QLN12	Feel safe walking at any time	.657	.761
	QLN13	Cost of living is not burdensome	Deleted	.662
	QLN14	Houses are affordable for all income groups	Deleted	Deleted

Note. QLM = Quality of life: Mobility, QLN = Quality of life: Neighbourhood

Constructs	Composite Reliability		Average Variance Extracted	
	Work	**Leisure**	**Work**	**Leisure**
DLU	.881	.880	.649	.649
DSG	.910	.880	.530	.514
DST	.901	.891	.751	.731
DAC	.838	.890	.569	.671
DMG	.872	.883	.536	.558
QLM	.906	.834	.522	.503
QLN	.901	.904	.505	.512

Note. DLU = Land-use diversity, DSG = Walkable design, DST = Density, DAC = Destination accessibility, DMG = Demand management, QLM = Quality of life: Mobility, QLN = Quality of life: Neighbourhood

HTMT Ratio (leisure sample group, n = 192)

Constructs	DMG	DST	DSG	DAC	DLU	QLM	QLN
DMG							
DST	.582						
DSG	.763	.478					
DAC	.831	.582	.707				
DLU	.651	.633	.469	.522			
QLM	.172	.114	.185	.123	.159		
QLN	.313	.187	.359	.254	.186	.639	

HTMT Ratio (leisure sample group, n = 168)

Constructs	DMG	DST	DSG	DAC	DLU	QLM	QLN
DMG							
DST	.562						
DSG	.742	.677					
DAC	.758	.605	.759				
DLU	.519	.579	.547	.581			
QLM	.245	.220	.410	.351	.196		
QLN	.377	.340	.461	.365	.403	.727	

A COASTAL EROSION DERIVATION FORMULA FOR VALUING THE COASTAL LAND VALUES IN MALAYSIA

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Abstract

The coastal area hosts significant economic activity with some of the highest property values, which the government and private investors aim to maintain and secure their interests. Yet, this area presented a growing risk to coastal properties' value because the land and structural attributes are vulnerable to erosion. Few empirical studies have included erosion rate besides the land attribute and reclamation in analysing its impact on the value of coastal land, especially in Malaysia. Hence, this study aims to derive a coastal erosion formula for valuing the coastal land values in Malaysia. Taman Alai Perdana (Crystal Bay), Melaka, was selected as a case study area for investigating formula derivation. Based on the formula derivation, the findings have determined that significant property values were affected by erosion in the study area. Using property One (1) in Crystal Bay Alai, Melaka, as an example, with a land area of $632m^2$, it was valued at RM163286.26 or RM236.81/m^2 before formula application. Then, by applying the formula for the same property, considering the identified area erosion rate of -1.41m required a reclamation width of 2.5m to rectify the erosion. Therefore, a value of RM163,286.26 with a difference of RM13,625.00 was determined. Hence, the study has determined reclamation and erosion rate should be included in the coastal land valuation.

Keywords: derivation formula, land value, coastline, coastal erosion

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INTRODUCTION

The coastal area hosts significant economic activity as an area of recreation, tourism, picnics, cultivation, fishery, ports, petroleum, oil, and gas, including some of the highest residential property values contributing to a country's economy. By referring to various researchers, there are several definitions regarding coastline. A coastline is the physical interface of land and water (Alesheikh, Ghorbanali, and Nouri, 2007; Dolan, Hayden, May, and May, 1980). Another definition by Nayak (2002) described coastline as the land and sea line of interaction between the terrestrial and tidal processes. A coastline is a transitional region between the terrestrial and marine environment with features (Ong, Gong, and Chan, 2001). However, in practice, it is challenging to determine coastlines zone due to some conditions or environments regarding the impact of waves, wind, tides, and coastal geomorphology. Generally, coastline position changes after a short or long time depending on the cross-shore and alongshore sediment movement in the littoral zone and prone area because of the natural factors of water levels such as waves, tides, groundwater, storm, and wind at the coastlines or coastal boundary.

Because of a combination of geographic, economic, and historical factors that attract people and encourage various migration processes, the majority of the world's megacities are now located along the coastline (Barragán and de Andrés, 2015; Brown, Keath, and Wong, 2009; Seto, Fragkias, Güneralp, and Reilly, 2011). In most countries, coastal population growth outpaces non-coastal growth. According to Small and Nicholls (2003), approximately one-fifth of the world's 1.2 billion people reside within 100 kilometres of the coast. By 2030, this figure will have risen to half of the world's population. Around 6 billion people are predicted to reside within 200 kilometres of the coast by 2025, indicating the potential for fast growth in coastal areas (Creel, 2003).

However, these coastal regions are threatened by erosion as many world coastlines experience this situation (Pilkey and Cooper, 2014; Zhu, Linham, and Nicholls, 2010). Coastal erosion occurred due to climate change, such as increased temperature and rising sea levels. It is expected that future erosion could be uncontrollable magnitudes for humanity (Jones and Phillips, 2009; Shi, Xu, Ye, Yang, Liu, Fang, Liu, Li, and Wang, 2015). The value of the economic activity and natural resources of the coastline zone can be seen in two components; namely, the current market value of all goods and services that are produced directly and indirectly from coastal resources and coast-related activities (which is equivalent to the gross national product-originating in the coastal zone) whilst the other components is on the intangible value such as recreation and other activities and resources that people enjoy but did not directly pay (Luger, 1991).

Subsequently, the coastal region hosts significant economic activity and is located with some of the highest property values in many countries and is vital to be protected and sustained. According to Catma (2021), local governments, businesses, and people are concerned about lost commercial activity and lower tax income as a result of coastal erosion's detrimental impacts on the tourism and hospitality industries. Furthermore, the loss of coastline due to erosion posed a hazard to surrounding properties because it served as a buffer zone against storm surges. In addition, the problem of coastal erosion worsens because the shoreline is a place where people focus on diverse activities and product development (Barragán and de Andrés, 2015). As a result, this phenomenon may affect property value, both favourably and negatively. Hence, research on determining the influence of coastal erosion on a property to maintain its value is called for.

RESEARCH BACKGROUND

The coastal area is delicate and vulnerable to various threats such as erosion that can affect the community's socioeconomic, environment and ecosystem. It is widely believed that erosion occurs continuously along the coastline due to natural and human factors. These include wearing away of land and removal of beach or dune sediments by tidal currents or rise in sea level (Bruun, 1988, 1989; Douglas, Kearney, and Leatherman, 2000; Kefu and Tegu, 2009; Nicholls and Tol, 2006; Schwartz, 1967; Teh and Voon, 1992) wave currents (Kearney, 2001; Silvester and Hsu, 1997) or climate changes (Adger, Hughes, Folke, Carpenter, and Rockström, 2005; Feagin, Sherman, and Grant, 2005; Zhang, Douglas, and Leatherman, 2004). Additionally, waves generated by storms and winds may take the form of long-term losses of sediment and rocks or merely the temporary redistribution of coastal sediments that could also cause erosion (Adger et al., 2005; Barnier, 1988; Feagin et al., 2005; Kearney, 2001; Kefu and Tegu, 2009; Silvester and Hsu, 1997; Zhang et al., 2004). Moreover, human interference such as dredging in a bay, construction of structures on the coastal beach which could disturb the movement of the sediments, coastal reclamation and other factors can also cause coastal erosion (Barnier, 1988; Leatherman, Zhang, and Douglas, 2000; Zhang et al., 2004). Also, the coastal erosion problem becomes much more significant, as coastlines are ideal for human concentrations and the development of different productive activities (Barragán and de Andrés, 2015).

Subsequently, the property values near the coast can be affected by environmental characteristics such as coastal erosion in ways similar to structural characteristics (Freeman, 1979; McNamara, Gopalakrishnan, Smith, and Murray, 2015). Currently, some studies have been conducted on the impact of coastal erosion on property value. For example, Jin, Hoagland, Au, and Qiu (2015) have identified that residences close to the ocean reduce the property value of RM1176 a year due to an annual erosion rate (1m) at Marshfield, Duxbury, and Plymouth,

Massachusetts. Another study by McNamara et al. (2015) also identified that erosion could affect property value in North Carolina and New Jersey by nearly 17% and 34% (as erosion from rising sea level reaches 4 m/yr) for high and low property value regions, respectively. However, there is a lack of study, especially in Malaysia, on property price valuation due to the impact of coastal erosion.

Generally, the main focus of the valuation is to address and justify the concept of economic value. Then, a Valuer must first estimate the highest and best use, or the most probable use of an asset to estimate market value which is the basis of value. By referring to the Board of Valuers, Appraisers, Estate Agents & Property Managers, market value is "*the estimated amount for which an asset or liability should exchange on the valuation date between a willing buyer and a willing seller in an arm's length transaction after proper marketing and where the parties had each acted knowledgeably, prudently and without compulsion".*
The International Valuation Standards Council (IVSC) and most of the world's major valuation standard setters refer to only three approaches to valuation: the Market/Comparison Approach, the Cost Approach and the Income Approach with valuation subsets, namely the Investment Method, the Residual Method, the Discounted Cash Flow Method and the Profits Method are used for estimating the market value of the property (Baum, Mackmin, and Nunnington, 2017; Board of Valuers, 2019; Colborne and Hall, 1993; French, 2004; Maliene, 2000; Skarzyński, 2006). Modern and advanced methods, like Artificial Neural Networks (ANNs), hedonic pricing, spatial analysis, fuzzy logic and Autoregressive Integrated Moving Average (ARIMA) (Arslan and Aydin, 2009; Jackson, 2008; Pagourtzi, Assimakopoulos, Hatzichristos, and French, 2003; Urbanavičiene, Kaklauskas, Zavadskas, and Seniut, 2009), as well as multiple criteria methods (Maliene, 2001; Peldschus, 2009; Zavadskas, Kaklauskas, and Maliene, 1997) becoming accepted progressively.

Currently, most coastal properties use hedonic pricing in valuing those coastal land or property. However, Chau and Chin (2003) identified a major empirical issue about the hedonic price model as the choice of the functional form. They stated that several basic functional forms could be applied to the hedonic price model, such as linear, semi-log, and log-log forms. Subsequently, Blomquist and Worley (1981) and Goodman (1978) stated that inconsistent housing price estimates might occur if the functional form is incorrectly used. Consequently, this study aims to derive a coastal erosion model for estimating Malaysia's coastal property values.

RESEARCH METHODOLOGY
This study begins with collecting data and information from relevant articles, reports, websites, and seminar papers on the influence of coastal erosion on property value, including data on sales transactions received from the State of

Melaka's Department of Valuation and Property Services (JPPH). Subsequently, secondary data collection involves data on residential sales transactions in the study area over four years (2014-2018). Although several residential developments are located on the West Coast (Malacca Strait) of Penisular Malaysia, this study's scope focused mainly on the Taman Alai Perdana (Crystal Bay) due to this residential scheme facing erosion problems, as shown in Figure 1. This residential scheme is situated in the Melaka Tengah district of the State of Malacca, which has a total coastline of 120.5 km, with 3.1% or 3.7 km being eroded. However, generally, the 73-km-long Malacca coast has a rhythmic form. The northern portion comprises headlands alternating with bays to form an offset coast. The southern part includes a series of shallowly scalloped bays with protrusions spaced at about 4.5 km.

Figure 1: The Coastline of Taman Alai (Crystal Bay), Malacca

In this research, the formula will be derived based on modeling coastal erosion using the regression model analysis. The data used to estimate the value of market valuation is from the year 2018 until the year 2021, and its factors are influenced primarily by natural factors. The updated orthophoto from aerial images of Crystal Bay, Alai Melaka, were collected in 2021, as shown in Figure 2.

There are various properties, such as vacant land, residential, commercial and industry. Table 1 shows examples of vacant land property transactions from 2014 to 2018 for Alai Melaka. Hence, two hypotheses are indicated in this research, specifically (1) the coastal erosion valuation model derived is inefficient, and (2) the derived coastal erosion valuation model can value coastal land and sustain the value of capital.
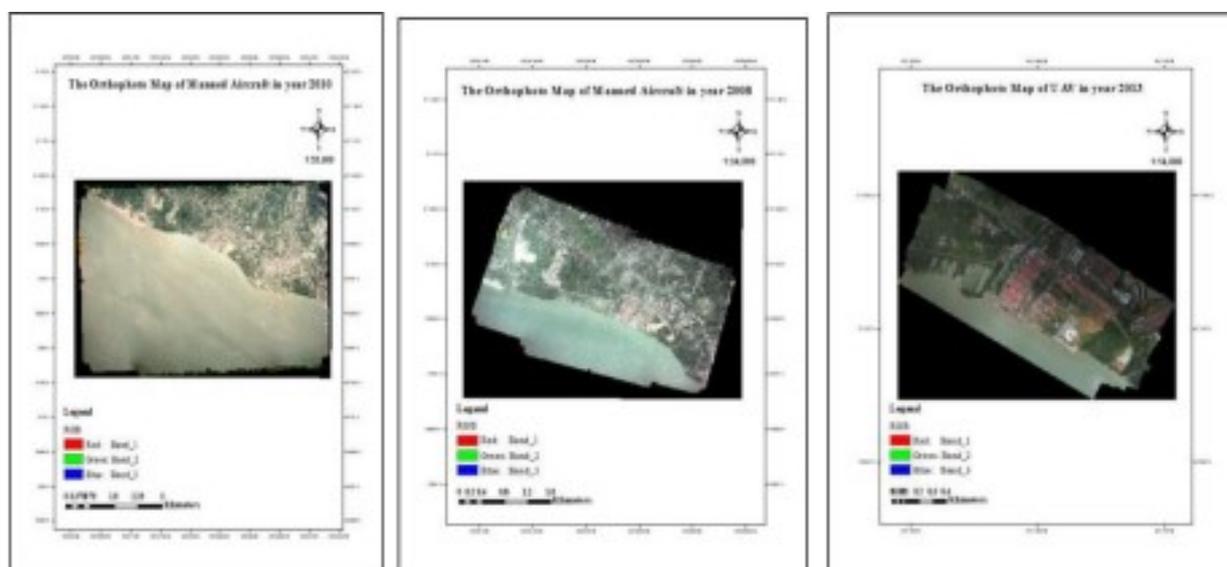
| (a) Orthophoto in year 2008 | (b) Orthophoto in year 2010 | (c) Orthophoto in year 2021 |

Figure 2: The Orthophoto of Taman Alai (Crystal Bay), Malacca from 2008, 2010 and 2021

Table 1: Transaction Data for Alai Melaka

No.	Date of Transaction	Land Size (sq. m)	Lot	Title	Category	Price Transaction (RM)	RM per m2
1	21-Jul-14	632	2670	Pajakan Negeri	Perdagangan	149,661.00	236.81
2	27-Jun-14	884	2665	Pajakan Negeri	Perdagangan	252,152.00	285.24
3	21-Jul-14	1182	2655	Pajakan Negeri	Perdagangan	292,000.00	247.04
4	18-Dec-15	773	2651	Pajakan Negeri	Kediaman	220,480.00	285.23
5	18-Dec-15	595	2641	Pajakan Negeri	Perdagangan	115,200.00	193.61
6	12-Jan-15	595	2639	Pajakan Negeri	Perdagangan	121,600.00	204.37
7	14-Dec-18	595	2633	Pajakan Negeri	Perdagangan	128,080.00	215.26

RESULT AND ANALYSIS

To derive a coastal erosion model for estimating Malaysia's coastal property values, the concept of coastal land valuation is based on erosion and reclamation as shown in Figure 3.
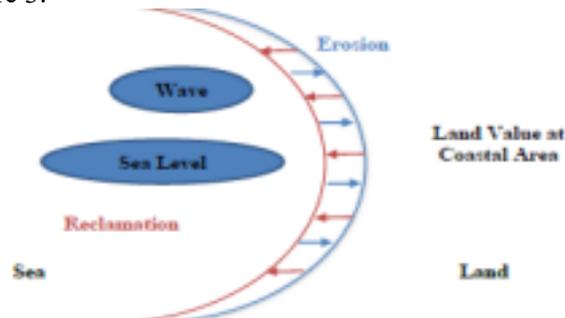
Figure 3: Concept of Coastal Land Valuation Based on Erosion and Reclamation

Figure 3 above shows the concept of determining the coastal land value based on the land attribute, erosion, and reclamation width. The red colour in the figure represents the prevention of the value, but it depends on the types of hard and soft defence structures used for maintaining the coastal line. Meanwhile, the blue represents the reduced coastal land value due to land depreciation. Subsequently, it is demonstrated that wave and sea levels influence the erosion rate, while reclamation mitigates erosion of the coastal area. Thus, based on the figure, the formula for calculating coastal land using the linear model formula is derived as shown below.

$ß = ά1 \times ά2 + ((-m1 + m2) \times Υ \times Ø) \times €$
Where,
ß = Land Value,
ά1 = Land Size
ά2 = Price per meter square (after applying the valuation method)
m1 = Erosion
m2 = Reclamation (width)
Υ = Coastal Length
Ø = Coastal Depth
€ = Price of Reclamation

The analysis and results of landed commercial property transactions data from 2014 to 2018 before and after the formula used are shown in Table 2. The table shows the property details such as the date of transaction, land size, title, category and transaction price.

Table 2: Analysis and Result before and after Formula

No.	Date of Transaction	Land Size (m²)	Lot	Title	Category	Erosion (m)	Reclamation (width) (m)	Depth (m)	Coastal Length (m)	Transaction Price (RM)	Formula Price (RM)	RM per m² (Before)	RM per m² (After)
1	21-Jul 14	632	2670	Pajakan Negeri	Perdagangan	-1.41	2.5	2.5	100	149,657.60	163,286.26	236.81	291.56
2	27-Jun 14	595	2665	Pajakan Negeri	Perdagangan	-1.41	2.5	2.5	100	130,001.55	143,626.55	218.49	241.39
3	21-Jul 14	1028	2655	Pajakan Negeri	Perdagangan	-1.41	2.5	2.5	100	265,563.24	276,463.24	258.33	268.93
4	18-Dec-15	595	2651	Pajakan Negeri	Perdagangan	-1.41	2.5	2.5	100	160,001.45	187,251.45	268.91	314.71
5	18-Dec-15	595	2641	Pajakan Negeri	Perdagangan	-1.41	2.5	2.5	100	160,001.45	170,901.45	268.91	287.23
6	12-Jan 15	595	2639	Pajakan Negeri	Perdagangan	-1.41	2.5	2.5	100	160,001.45	170,901.45	268.91	287.23
7	14-Dec-18	884	2633	Pajakan Negeri	Perdagangan	-1.41	2.5	2.5	100	252,152.16	263,052.16	285.24	297.57
8	14-Dec-18	773	2622	Pajakan Negeri	Perdagangan	-1.41	2.5	2.5	100	220,482.79	231,382.79	285.23	299.33

The table above shows differences in land value compared to data transactions using the derived formula. As an example, item number 1, its erosion rate is -1.41m, followed by the reclamation width is 2.5m, the price per square meter is RM236.81 (before adjustment), land area (632m2), land value using the formula (RM163,286.26) and the transacted land value (RM149,661.00). From this calculation, although the coastal area is affected by erosion, the difference between transacted land value and the formula of item number 1 is RM13,625 which determines that the land value can be sustained or slightly increased due to reclamation.

The coastal land value derived from the Melaka formula was analysed using the statistical t-test. The t-test of the derived formula is a comparative test to assess the coastal land value between the results of using the formula and transacted land value. Based on the analysis, the formula's effectiveness was determined by the confidence level for the t-test is 95% (where $\alpha=0.05$). The hypothesis of the test is:

H_o: $\mu_1 = \mu_2$: There are no differences in land value between the derived formula and transacted data

$_{HA}$: $\mu_1 \neq \mu_2$: There are differences in land value between the derived formula and transacted data

The null hypothesis, Ho (which indicates the tested method is not significant), will be rejected if the calculated t value is higher than the critical t value (predicted from the t-distribution table) with the selected level of significance (e.g. $\alpha = 0.05$). The test method is statistically significant with the rejected Ho (accept H_A, alternative hypothesis). Below is the t-test result between land value derived from the formula and transacted data for three locations of the coastal area.

Table 3: T-test result between land value

	Land Value (Formula)	Land Value (Formula)
Mean	156241.6526	154223.3333
Variance	2625246971	2604326367
Observations	24	24
Pearson Correlation	0.999992885	
Hypothesized Mean Difference	0	
df	**23**	
t Stat	35.16636197	
P(T<=t) one-tail	8.43162E-22	
t Critical one-tail	1.713871528	
P(T<=t) two-tail	1.68632E-21	
t Critical two-tail	2.06865761	

CONCLUSION

Thus, it can be concluded that this study has provided empirical findings through the derivation of the formula coastal property valuation with the inclusion of erosion and reclamation factors. Also, several types of research can be considered for investigation in the future. Firstly, research can be extended to other coastal areas such as Terengganu, Kedah and Pahang. Secondly, research on applying this formula as a calculation system using programming software such as Matlab, C++ and others to facilitate the valuer in calculating the coastal land where this software can be integrated with other input files such as excel and text files. Thirdly, research on the value of coastal properties based on the scheme can be conducted to determine coastal property marketability for future development.

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FACTORS INFLUENCING HOUSE BUYER'S DECISION IN MALAYSIA. CASE STUDY: SEPANG, SELANGOR

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Abstract

Housing is a basic human need as explained in the Maslow hierarchy needs. Having a house is a very important entity in ensuring a sense of security for each individual and family. Deciding on buying a house is a crucial decision since housing expenses involved a large amount of cost in individual monthly expenses. Furthermore, the homeownership rate in Malaysia as reported by the Department of Statistics Malaysia (DOSM) in 2019 didn't increase significantly. Thus, the government and house developers need to identify the important factors that influence the house buying decision-making to increase the homeownership rate in Malaysia. This study investigates the factors influencing housing buying decisions and the difference in factors influencing different income groups in Sepang, Selangor. This study measures the internal factors and external factors influencing house-buying decisions. The internal factors measure the income, stage of life cycle, employment and education subfactors. The external factors measure the financial and economic condition, house price, location, neighbourhood, house type and design and also government housing incentives. A mixed method was applied in this study by interviewing real estate experts and also a survey of 184 respondents in the case study area. Using transcribe method and analysing of the survey data with descriptive and inferential analyses to study the influencing factors. The real estate expert and respondents agreed all the factors were influencing house buying decisions except for education. The importance of the factors is also different among the income groups. For internal factors, all income groups agree that income is the most influential factor followed by employment, stage of life cycle and education. The importance of external factors is different among the groups.

Keywords: housing, factors influencing, house buying decision, income group, internal and external factors

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INTRODUCTION

Housing is a basic human need as explained in the Maslow hierarchy needs. Maslow's theory proposes a five-tier model of human needs, comprising physiological needs, safety needs, belongingness and love needs, esteem needs and finally, self-actualization. To satisfy the highest need, one must fulfil the lowest need and a house is categorized as one of the safety needs. Purchasing a house is the biggest spending in most family financial plans. It's one of the customer consumptions which is significant to the national economy and to serves the psychology and social need (Abdullah, 2012). A person may have to consider many factors when deciding to purchase a house since it is the most expensive spending for a household. It is a development that involves a life commitment starting from the down payment to the monthly payment. According to Abidoye et al., (2021), factors influencing purchase decisions its divided into two main factors which are an internal and external factor. Internal factor is related to the person's ability and preference. Whilst external factor is the outside aspect that the purchaser may not control. Example of internal factors is income, family, or education. Characteristics of the house and economy are an example of external factors. According to the consumer behaviour model introduced by Howard and Seth, (1969), rational buyer behaviour is based on a decision-making process that involves certain rules that are appropriate to the purchase and satisfaction motive. In line with this, consumer behaviour factors are also seen as among the factors considered in deciding to purchase residential property. The factors may also differ among different incomes or age groups. The previous study concentrates only on middle-income group preferences such as Besar et al., (2020), Mohamed et. al., (2020); Zainon et. al., (2017).

This study aims to provide an in-depth overview of the factors influencing house buyer decision-making in Malaysia among different income groups in Sepang, Selangor. According to The EdgeProp (2021), Sepang started to embark rapidly in development since 2000 and this can be reflected by the increment of household income and new development. The median and mean household income in Sepang is showing that majority of Sepang resident are in M40 income group. This also can be proved by the percentage of household according to household income group where it is reported the highest income group in Sepang is the M40 group, followed by the T20 group and the smallest group is the B40 group. Due to the increasing population in Sepang, the housing units are also showing increment yearly as reported by National Property Information Centre. Hence, Sepang District is a suitable area to study on factors influencing housing buying decision because of the demand on housing.

RESEARCH BACKGROUND
Housing in Malaysia
Malaysian government had introduced various agendas and policies to provide Malaysian affordable, comfortable and adequate houses to live in. According to the Government of Malaysia (2019), Housing Policy in Malaysia are divided into five phases, which is the Early Independence Housing Phase (before 1957 – 1970), Housing to Cope the Poverty Problem Phase (1971 – 1985), Market Housing Focus Phase (1986 – 1995), Housing for Squatters Phase (1996 – 2010), and Affordable House Phase (2011 – 2025). The Malaysian housing policies have evolved rapidly throughout the years. From the early years before independency which focus on health issues and resettlement emergency areas to avoid communist attacks then focused on to cope poverty problem in urban and rural areas, shifting to market houses focus for 10 years, then solving squatter's problem and the recent focus of Malaysia Government is to provide affordable houses for the lower- and middle-income group.

Report from the National Property Information Centre (NAPIC) in 2021, until the first half of 2021, there are 5,904,165 houses recorded in Malaysia. This data comprises houses in a scheme which is collected from developers consists of single to three-story terrace houses, detached and semi-detached and also high-rises such as condominiums and apartments. As for the house price, Malaysia had experienced an uptrend price since 2013 (NAPIC, 2021). The median price for houses in Malaysia in 2011 was around RM158,000 but in 2021 the median house price in Malaysia is reported RM300,000.00. It shows there is a 90% increment within 10 years.

House prices in Malaysia is reported unaffordable since a decade ago (Abdullah et al., 2021; Yap & Ng, 2018; Baqutayan, 2014). However, housing affordability had been a global issue and many countries are facing the same issue. House prices are increasing yearly making it unaffordable especially for those from low and middle-income groups (Zamri, 2019; Hashim, 2010). Homeownership rate in Malaysia as reported by Department of Statistic Malaysia in 2019 has increase to 76.9% from 2016 where the homeownership rate was 76.3%. The Figure 1 below shows there are only 0.6% increment of homeownership in 2019. This indicating there are 23.1% of Malaysian household doesn't own house in 2019.

Figure 1: Percentage of Homeownership by Household in 2019
Source: Department of Statistic Malaysia, (2020)

Income Group Classification in Malaysia
Income is an important proxy for measuring a person's socioeconomic status or standard of living. Malaysia had been defined by the World Bank as an upper-middle income country since 1992 with gross national income per capita in 2019 ranging from USD4,046 to USD12,535. Malaysia is on track to become a high nation income between year 2024 to 2028 (The World Bank, 2021). It is in-line with the government Shared Prosperity Vision, to provide a decent standard living for all Malaysian by 2030.

Malaysia government had introduced an income classification system since 2017. The income classification system is important to ensure Malaysia government to plan, monitoring and provide suitable incentives to the needed group and could help to reduce gap between the income group in Malaysia. The income is based on the total household income received within the reference period of year (DOSM, 2020). The classification of income group in Malaysia was determined into three groups which are which are B40 (low-income group), M40(middle-income group) and T20(higher-income group):

Table 1: Income Group Classification in Malaysia, 2020

Income Classification	Definition	Income (RM)	Details
B40	40% of national income, lowest-earning group	Below 4,850	Bottom 40%
M40	40% of national income, middle-earning group	4,851 - 10,960	Middle 40%

Income Classification	Definition	Income (RM)	Details
T20	20% of national income, highest-earning group	More than 10,961	Top 20%

Source: *Department of Statistic Malaysia, (2020)*

The inadequacy of affordable housing for M40 households in the urban areas remains a concern with the rise of housing prices. Furthermore, the implementation of affordable housing programmes by the public agencies tends to target the B40 households. Consequently, the M40 households, especially of those in the lower half of the group, simply cannot afford to purchase their own home, especially with the drastic increase of housing prices and at the same time, they are not eligible to purchase low-cost home (CIDB Malaysia, 2019). Furthermore, this study is tended to assess the factors influencing housing purchasing decision to identify each income group needs.

Factors Influencing House Buying Decision
Homeownership is preferred over renting because it provides greater safety, freedom, financial advantage, and results in higher housing satisfaction. In many countries, one of the objectives of housing policy is to encourage private homeownership. This policy objective assumes that owning one's own house has a positive effect on the individual and society as a whole (Elsinga & Hoekstra, 2005). Housing ownership may also influence the political, socio-economic, and social well-being of the public (Abdullah et al., 2021). It is important to provide homeownership opportunities among citizens as a continuous agenda to ensure a developed and healthy nation.

Abidoye et al., (2021) did research on young adults in Jakarta, Indonesia factors determination in owning houses. The result reveals the factors are divided into external factors and internal factors. External factors are related to policy and regulation, credit accessibility, financial and economic condition, labour market, housing affordability and affordable housing supply. Whereas the internal factors are linked to education, income, marriage, employment and family background, student loan, health condition, parents' homeownership, and family support. According to literatures, the internal decision is the main factors however, the external factor may also affect the house owning decision or homeownership. Internal factors are depended on the individual background and perspective, which can be controlled by the individual. However, the external factors are outside of control by the individual. The factors are influenced by the economy, market, developer, and regulation. It is depended on the individual on how to choose and accept the external factors in making decisions. The internal and external factors are the inputs, perceptual and learning constructs in a consumer buying behavioural model to decide on purchasing a house. The

diagram below shows the summary of internal and external factors that influence people's decisions when purchasing a house:
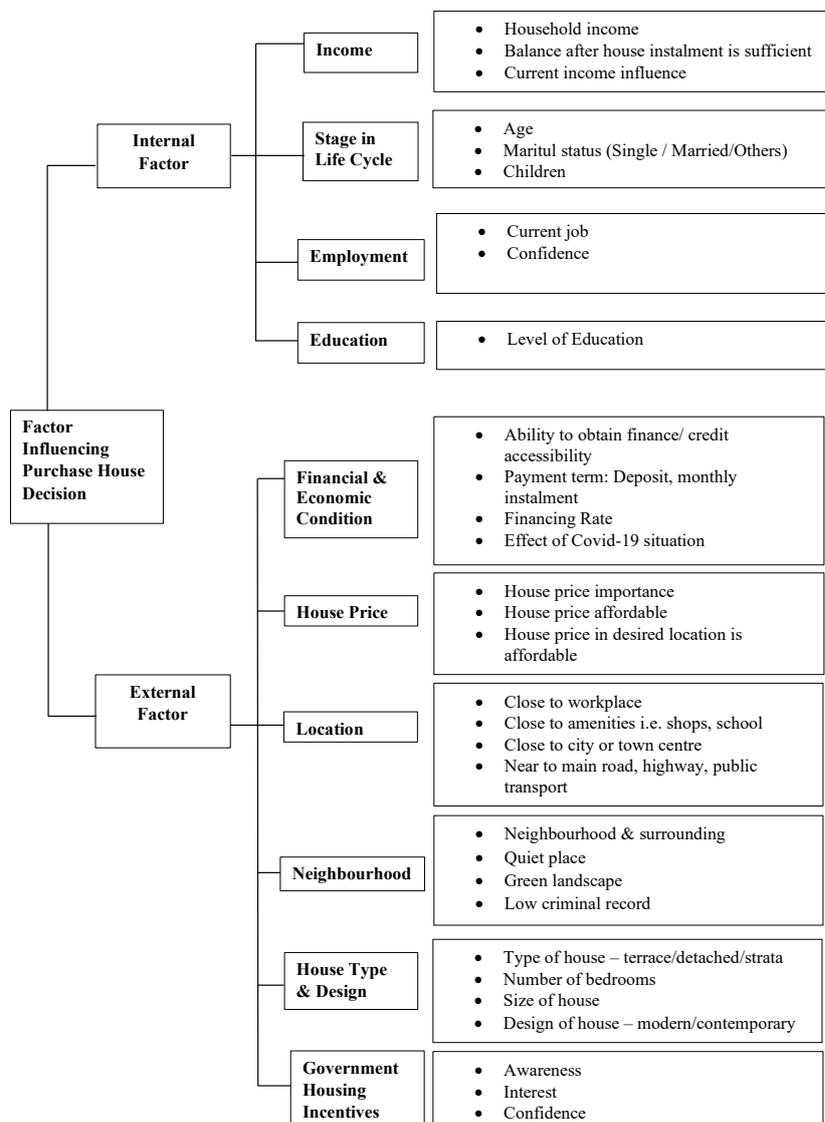
Figure 2: Internal and External Factors Influencing House Buying Decision.
Source: Author (2021)

Previous research has established income is an important factor in house buying decision making (Abidoye et al., 2021; Mohamed et al., 2020; Chin, 2016). The level of income will affect the buyer purchasing power. In housing,

family life-cycle or always referred as family life-cycle influenced the house buying decisions (Abdullah et. al., 2012). Studying the first-time house buyer determination in house buying decision, stage in life cycle is related to age, marital status and number of children or household. Filandri and Bertolini (2016), in their study found among the internal factors, employment type is the most influential factor, as permanent employment provides stable income and is necessary to save money for the down payment to get a mortgage loan. Barlow and Ozaki (2003), mentioned level of education is also an indicator of lifestyle buyers. Some research had provided finding, the higher education level will affect people to be choosier in buying property. That's indicated, people with higher education can choose which type, location and price of property purchasing decision.

For external factors, housing expenses is the highest expenditure in a household. Household finance involves a huge amount of money and long-term commitment. Therefore, a household must consider and think carefully when making house buying decision. Abdullah et al., (2012), showed financial and economic condition are the most influencing factor for first time house buyer. More research on factors influencing house ownership had revealed, house price is also one of the main factors that contribute. Mohamed et al., (2020) analysis a few factors influencing M40 homeownership in Putrajaya and concluded that house price is considered the second most important factor. A study done by Zainon et al., (2017) identified there is a positive correlation between house price and location and conclude the M40 group are not able to own a house in desired location because the price is to high compared to income. According to Aliyu et al. (2013), location is one of the main factors determining a residential property value. Kurniawati (2017), mentioned elements which are related to location include: the selection of a strategic location (easily accessible), in the area around the shopping center, near residential areas, safe, and convenient for customers, supporting facilities such as parking spaces, and other factors. Another finding from Abdullah et. al., (2012) in their research, reveal that when an individual decides to purchase a house, one of the factors considered are the neighbourhood surrounding in the desired house. They had listed a quiet place; green surrounding and low criminal record are the element a first-time house buyer is looking when purchasing a house. Khan et al. (2017) in their study, identified some other factors such as design characteristics, construction quality, and security and safety influence people decision. Mohamed et. al., (2020), include government housing incentives as one of the factors influencing house buying decision. The respondent was asked about the awareness of the incentives, the knowledge of the incentives and whether the incentives helping them to purchase the house.

To increase the homeownership among Malaysian, it is important to know the factors that influence Malaysian house buying decisions. Since housing expenditure is a large amount of a household, it is important for an individual to

carefully arbitrate the decision. According to the literature review, the factors influencing house buying decision is classified into two main factors which are an internal and external factor. Internal factors are income, stage in the life cycle, employment, and education. External factors are financial and economic condition, house price, location, neighbourhood, house type and design and the government incentives. By knowing the factors influencing the house buying decision making, developers and government could provide the housing and incentive accordingly to help Malaysians to own houses.

ANALYSIS AND RESULT
To investigate the factors influencing house buying decisions, a mixed method approach is used in this research by interviewing real estate experts and survey respondents in the case study area.

      The qualitative approach was conducted by interviewing five (5) real estate experts to find out the factors influencing house decision buying. For internal factors, the interviewees agreed on income, stage of life cycle and employment can influence house buying decisions. However, most of the interviewees do not agree education can influence house buying decision. For external factors, the interviewee agreed all the listed external factors does influence house buying decision. They were asked to rank the factors according to the importance and the finding as below:

Table 2: The ranking of internal and external factors according to importance by real estate experts.

Internal Factors	External Factors
1.Income 2.Employment 3.Stage in Life Cycle 4.Education	1.Location 2. House Price 3.Financial & Economic Condition 4. Neighbourhood 5. Government Housing Incentives 6. House Type & Design

Source: Author (2021)

      Using a questionnaire to survey the respondent's opinion on the factors house buying decision. The data was collected through 184 respondents in Sepang District and the data were analyse using IBM SPSS 25. In general, the three-income group agreed the internal factors are important in-house buying decisions except for education which score lower than 50% in the crosstabulation calculation. For the external factors, all the factors are considered important influencing house buying decisions.

      Through the Kruskal-Wallis test, it is proved that the internal and external factor is the same across of categories of income group B40, M40 and

T20 except for the age and confident factors which are categorized under the internal factors.

Table 3: Kruskal-Wallis Result

Item	Sig. Value	Significant
Internal factors		
Income	.803	Not significant
Balance	.687	Not significant
Current Income	.681	Not significant
Age	**.039**	**Significant**
Status	.245	Not significant
Household	.534	Not significant
Job	.34	Not significant
Confident	**.030**	**Significant**
Education	.28	Not significant
External Factors		
Finance	.544	Not significant
Deposit	.984	Not significant
Rate	.684	Not significant
Economic	.997	Not significant
Price	.465	Not significant
Price Income	.520	Not significant
Price Location	.469	Not significant
Location	.526	Not significant
Work-place	.941	Not significant
Amenities	.797	Not significant
City	.635	Not significant
Main Road	.575	Not significant
Neighbourhood	.108	Not significant
Quiet	.735	Not significant
Green	.801	Not significant
Criminal	.859	Not significant
Type	.921	Not significant
Bedroom	.797	Not significant
Size	.654	Not significant
Design	.987	Not significant
Incentive	.388	Not significant
Utilized	.681	Not significant
Helping	.313	Not significant

Source: Author (2021)

The table above, the significant level for each factor is more than significant level 0.05 except for age which significant at 0.039 and confident at

0.030. It is proved that the internal and external factor is same across of categories of income group B40, M40 and T20 except for the age and confident factors which is categorized under the internal factors.

From there, a mean analysis was done and the finding The T20 group agrees age can influence an individual housing buying decision making. In the confidence factor, the B40 group scores the lowest because they think they are not confident to purchase a house with their current job at the moment. The three-income group was also requested to rank the internal and external factors according to importance. The internal factor ranking was as follows:

Table 4: Summary Internal Factor Ranking According to Income Group

Internal Factor	B40		M40		T20	
	Rank	Mean	Rank	Mean	Rank	Mean
Income	1	3.48	1	3.55	1	3.42
Stage in Life Cycle	3	2.67	3	2.85	3	3.02
Employment	2	3.04	2	3.15	2	3.16
Education	4	2.5	4	2.47	4	2.73

Source: Author (2021)

Table 5: Summary External Factor Ranking According to Income Group

External Factor	B40		M40		T20	
	Rank	Mean	Rank	Mean	Rank	Mean
Financial and Economic Condition	1	3.22	1	3.27	2	3.26
House Price	3	3.07	1	3.27	1	3.27
Location	2	3.10	2	3.15	5	3.09
Neighbourhood	5	3.01	3	3.10	3	3.16
House Type & Design	4	3.04	4	3.09	4	3.11
Government Housing Incentives	4	3.04	5	3.00	6	2.98

Source: Author (2021)

However, for the external factors, the result was not the same between the income groups in Table 5. The M40 and T20 group are more concerned with the house price compared to the B40 group which are concerned with the financial and economic condition. This is because the B40 are qualified to buy low-cost or affordable housing compared to the M40 and T20 group. M40 and T20 group are not qualified to buy low-cost houses and have no choice but to select higher

house price. The ranking shows that, there are difference factors that influence different income group. This is supported by the real estate expert statement, which mentions the factors influencing income group are different because each group have their own priorities and need.

The respondent was also asked to give an opinion if there are other internal and external factors that may influence house buyer decision making. From the table below, the most repeated other factor influencing house buying decision suggested by the respondent is natural disaster such as flood and land slide, followed by the developer performance, status of land whether it is leasehold and freehold, family influence and future market value. Since, Sepang is an area prone to flood, the respondent is concern of the natural disaster factor in house buying decision.

Table 6: Other Factors Influencing House Buying Decision

Factor	Frequency (Count)
Natural Disaster such as flood and land slide	6
Developer performance	4
Status of land (Leasehold/freehold)	3
Family Influence	2
Future Market Value	2

Source: Author (2021)

CONCLUSION AND RECOMMENDATION

The conclusion from this study, the B40 group in the case study area are more concerned about the government housing incentives compared to the other group although there are a lot of government housing programme and incentives. Thus, it is important to identify and evaluate which incentives that is the most significant and strengthen the incentives to increase the homeownership rate in Malaysia.

From this study, it also learned that house price and location are important factors in every group finding. It is important for the developer to study which price and location are suitable for every income group when planning a new development housing scheme so there will be no overhang property problem. Another interesting finding, the buyers are also concerned about the disaster factor such as floods and landslides when deciding on house purchasing. From this, the developer's company should study if the area for new development is free from such natural disasters to ensure buyers' satisfaction.

For future research, it is recommended to study the effectiveness of housing incentives by the government. Identifying which government housing incentives could help each income group could help every Malaysian to own a

house. It also recommended to study factors influencing house buying decision in another district in Selangor.

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A COMPARATIVE ANALYSIS OF THE APPLICATION OF JOINT TENANCY IN THE ADMINISTRATION OF REAL PROPERTY IN MALAYSIA, SINGAPORE, AND AUSTRALIA

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Abstract

Joint tenancy has been applied when one of the joint tenants dies; the deceased's left portion must be given to the surviving joint tenant. The National Land Code (Act 828) acknowledges the concept of joint ownership in form of tenancy in common while the right of survivorship was only acknowledged in the National Land Code (Penang and Malacca Titles) Act 1963. Therefore, the research aims to explore the concept of joint tenancy and the existing laws governing the joint ownership in Malaysia. This research is based on the qualitative research and analysis of the primary and secondary materials through the governing statutes and reported cases. The research also explores the practice of joint tenancy in Singapore and Australia for comparative analysis. It is predicated that the application of joint tenancy would give the advantage to the surviving joint tenant towards the full enjoyment of the property.

Keywords: Joint Tenancy, Right of Survivorship, Administration of Real Property

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INTRODUCTION

Joint ownership refers to the property owned by two or more persons. There are two main types of joint ownership of real estate namely tenancy in common and joint tenancy. Concurrent ownership of an undivided or individual interest in real estate is referred to as tenancy in common. Any tenant has the right to transfer ownership by will, deed, or other legal instrument. If one of the tenants in common passes away, his or her interest in the property will be dispersed in accordance with the terms of his or her will, if any, or the laws of intestacy, as applicable.

In contrast, the idea of joint tenancy has been applied in common law to administer an estate that comes into existence once a joint owner or tenant passes away. According to the underlying principle, joint tenancy is an uncommon type of ownership that cannot be transferred via inheritance.[1] For joint tenancy, the title must be obtained simultaneously through the same conveyance, and it must be stated on the instrument that the intention is to create a joint-tenancy estate.[2] Due to the right of survivorship provided by joint tenancy, the interest in the property will transfer to the remaining tenants following the death of any joint owner or tenant, regardless of the terms of the decedent's will, if any.[3] This means that in the event that a co-owner or co-tenant passes away, the remaining joint owner will continue to be the sole legal owner of the property.

Despite the aforementioned, the National Land Code (Act 828) only recognises tenancy in common, not joint tenancy. As a result, the ownership will be shared both during and after the joint tenant's lifetime and will be regarded as a part of the deceased joint tenant's estate. This had proved difficult for the surviving joint owner, mainly when the property was acquired and developed jointly by the joint owners.

Singapore and Australia are examples of Commonwealth countries that use joint tenancy in land law. Therefore, the research analyses the law and practice of joint tenancy in Malaysia, as well as Singapore and Australia for the comparative analysis. All of these countries adopt the Torrens system, which bases the law of conveyance on the idea of indefeasibility of title. Since Singapore's land laws is applicable for general application, both Muslims and non-Muslims are subject to them, creating a dual legal system like to that of Malaysia. This study is based on a qualitative research and analysis of primary and secondary sources, including the governing statutes, reported cases, and data obtained from the relevant administrative agencies. It is assumed that the application of joint tenancy would allow the proprietor additional alternatives for planning the management of his property and give the surviving joint tenant the advantage of being able to fully enjoy the property.

THE APPLICATION OF CONCEPT OF JOINT TENANCY IN MALAYSIA

In Malaysia, law of succession is governed in two ways: Muslims and non-Muslims. Without a heritable estate, inheritance cannot take place. The succession for non-Muslims could be determined by a will, statutory rules of intestacy, or combination of both. A will has been executed determines how a deceased non-estate Muslim's will proceed and who will inherit it. Conversely, in the event of intestacy, the Distribution Act 1958 (Amended 1997)'s statutory rules of succession will be in effect.

It is a religious obligation for Muslims to distribute their estates in accordance with the prescribed law, i.e the faraid, upon death. According to the law of succession, a joint tenancy is a type of possession where each tenant will inherit the same piece of the asset and all owners of the asset have equal rights.[4] Every co-owner must agree to any transaction involving the property. As a result, it is not separate ownership but rather carries joint possession around co-owners who act on a mutual decision.[5] As a result, if one of the joint tenants passes away, the surviving tenant will obligatorily be conceded the deceased's remaining half.[6] According to the underlying principle, joint tenancy is uncommon in the context of land ownership and cannot be divided via the succession process.[7]

Sections 343 to 345 of the National Land Code (Act 828) recognise the concept of joint ownership in the form of tenancy in common. In the meantime, Section 47(1) of the National Land Code (Penang and Malacca Titles) Act 1963 (Act 1963) recognised the concept of joint tenancy with the right of survivorship.

The court, in the case of *Salmah bt Omar & Ors v Ahmad Rosli bin Aziz (administrator of the estate of Osman bin Mohamed, deceased) & Anor*,[8] provided that a joint tenancy is a way to transfer ownership of property held by two or more people in equal interest, with the right of survivorship going to the surviving joint tenant(s). The documents must have been acquired concurrently by the same conveyance and explicitly describe the purpose to create a joint tenancy estate. The court held that an application of the joint tenancy was not strictly applied to Muslims but subject to the acceptance of Islamic law.

However, the court distinguished the above decision in the case of *Peter Chong & Anor v Khatijah bt Md Ibrahim & Anor (personal representative of Aishah bt Ibrahim, the deceased) and another suit*,[9] wherein Lim Chong Fong, J, expressed the opinion that the Mohammedan Ordinance that had codified customary law applicable to the Muslims did not apply to the conveyance and only applied to property relating to Islamic marriage and intestacy. The court ruled that Islamic law does not prevent or invalidate the conveyance or the resulting joint tenancy. Nonetheless, if that applies, the conveyance being a hibah ruqba does not contravene Islamic law.

The equivalent concept of joint ownership in Muslim law is called hibah ruqba or conditional gift. The impact of a hibah in Muslim law is described by Faiz Badruddin Tyabji,[10] in Muslim Law, the Personal Laws of Muslims in India and Pakistan at p 300 as:

"The legal effect of hiba is that the immediate and absolute ownership of the subject of the hiba is transferred to the done; and where the property is purported to be transferred by way of hiba with conditions, or restrictions, as to its use, or disposal, or alienation, the conditions or restrictions may be void."

The National Land Code (Act 828) permitted the transfer of land through gift by virtue of Section 215 whereby the title of the transferor shall pass to and vest in the transferee upon the registration of any such transfer, together also with the benefit of any registered interests then enjoyed with the land.[11]

However, pursuant to Item 1, List II (State List), Ninth Schedule of Malaysia Federal Constitution, the Islamic law applies to Muslim personal laws which includes succession, testate and intestate, betrothal, marriage, divorce, dower, maintenance, adoption, legitimacy, guardianship, gifts, partitions and non-charitable trusts; Wakafs and the definition and regulation of charitable and religious trusts, the appointment of trustees, etc.[12] This concluded that hibah matters are governed by the Enactment of each state in Malaysia and under the jurisdiction of Syariah Court.

Since the surviving spouse immediately becomes the sole owner following the death of either partner without the requirement for a grant of representation, joint tenancy is the most prevalent type of co-ownership amongst married couple under common law. Eventually, it may also be a method for handling joint assets acuired during an ongoing marriage. As a result, the common law presumption of tenancy in common, which is applicable in Malaysian land law, may produce outcomes that are contrary to the expectations and aspirations of the majority of spouses.

THE APPLICATION OF CONCEPT OF JOINT TENANCY IN SINGAPORE

Singapore's Land Titles Act of 1993 (Cap 157) was passed to regulate land matters. Joint tenancy and tenancy-in-common are the two forms of ownership recognised by Section 53 of the said Act. Each partner tenant in a tenancy-in-common owns a unique and separate piece of the property. When the owner of the tenancy-in-common passes away, his portion of the agreement becomes a part of his estate.

On the other hand, joint tenancy in the form of an undivided share, as the provision has underlined that in the incident of co-ownership where any property is vested in two or more people as co-owners, their allocations therein shall be equal except where different amounts are underlined in the registration records. The joint tenant's interest in the property ceases upon his death. A tenancy in common can be created by legally severing a joint tenancy. In England, this situation existed prior to the Law of Property Act of 1925.

The court in the case of *Williams v Hensman*,[13] stated that a joint-tenancy may be severed in three ways: in the first place, an act of any one of the persons interested operating upon his own share may create a severance as to that share. The right of each joint-tenant is a right by survivorship only in the event of no severance having taken place of the share which is claimed under the jus accrescendi. Each one is at liberty to dispose of his own interest in such manner as to sever it from the joint fund losing, of course, at the same time, his own right of survivorship. Secondly, a joint-tenancy may be severed by mutual agreement. And, in the third place, there may be severance by any course of dealing sufficient to intimate that the interests of all were mutually treated as constituting a tenancy in common. When the severance depends on an inference of this kind without any express act of severance, it will not suffice to rely on an intention, with respect to the particular share, declared only behind the backs of the other persons interested.[14]

Any joint tenant has the right to sever a joint tenancy of any estate or interest in registered land by filing a declaration in the authorised form and serving copies of the document to the other joint tenants either personally or by registered post. Upon the registration of the instrument of declaration, the respective registered estates and interests in the registered land shall be held by the declarant as tenant-in-common with the remaining joint tenants in equal shares.

The Singapore Titles Automated Registration System (STARS) shall be used for the registration process and the submission of any pertinent documents relating thereto. The Land Titles Registration and Public Search Service of the STARS is computerised. A web-based system called STARS eLodgment allows users to create, edit, copy, delete, and submit documents related to land transactions using simple electronic forms.

An application for joint tenancy will only be rejected on procedural grounds by the Land Authority/Registry, not substantive grounds for instance, the applicants apply for joint tenancy but also include the percentage of shares; the name or identity card number is incorrectly stated, and so on. If the former occurs, the Registry will object and give the applicants instructions to modify the instrument. The certificate of correctness that is in the instrument of transfer must be submitted by the co-proprietors. The certificate of correctness is significant

because it attests to the document's good faith creation, the substantial accuracy of the information stated in the instrument, and the co-owners' legal capacity (under Section 59 of Land Titles Act 1993). However, if there is the existence of any specific agreement or arrangement, it will only be known or handled by the lawyers. A court must decide any disputes or challenges that have arisen. The received order is then given to the land registry so that further action can be done.

Both Muslims and non-Muslims must register joint tenancies using a similar approach. Muslims are not subject to any additional requirements because land law is governed by general application and does not have an impact on the manner of holding of the land.

The remaining tenant must submit a valid notice of death form together with a death certificate. Although lawyers often produce the notification of death, there is a system in place where the land authority permits self-service when dealing with a straightforward paperwork. After processing the application for around three weeks, the registrar will contact with the remaining tenant to arrange for collection of the newly issued title. On the other hand, the co-tenants' deaths will not immediately result in the issuance of the new title.

The concept of joint tenancy has been utilised by Muslims as a way to handle the estate following after the death of the co-owner or co-tenant. Application of joint tenancy in Singapore has evolved over 20 years ago as in 1997, based on the 1st fatwa, the Fatwa Committee viewed the joint tenancy contract as a form of shared ownership. Each joint tenant owns half of the entire property. When a joint tenant passes away, the surviving owner is entitled to only 50% of the property, and the remaining 50% is subject to distribution by faraid.[15]

In 2008, the Islamic Religious Council of Singapore have reviewed and issued fatwa pertaining to joint tenants, in two directions, namely, the co-owner only received half of the share, or only inward his actual share in the property, after the demised of other co-owner, if there was no earlier agreement have been made among them. The left assets will be inherited by heirs' of the deceased. Secondly, if there was an agreement between the co-sharers, either under a mode of ruqba (conditional gift) or in a form of nazhar (vow) which clearly indicates that the assets are to be given totally to the existing co-sharer, after the demised of one of them, subsequently the survivor will own the property. In the absence thereof, their share can be divided according to faraid after his death.[16]

In the case of *Shafeeg bin Salim Talib and another v Fatimah bte Abud bin Talib and others*,[17] the court held that an inter vivos joint tenancy gift of real property by Muslims is valid. Since there was no specific legislation which prevented the operation of the right of survivorship in a joint tenancy of land held by Muslims, the half share passed to the Respondent as the surviving joint tenant under the right of survivorship at common law and, therefore, it did not form part of the estate.[18]

In 2019, MUIS issued a new fatwa. Buyers who purchase a property as joint tenants can be assured that the joint tenancy contract is also religiously valid without having to draw up additional documents. It is thus a new form of contract with its benefits that serve the community's needs. Islamic scholars are of the opinion that the general ruling of a new contract is permissible. Although it is considered as a contemporary and new contract that cannot be found in traditional Islamic law, it is permissible because the contract does not conflict with Islamic principles and based on the legal maxim "the original rule in the transaction is permissibility." Furthermore, the objective of the contract is clear, does not contain any ambiguity, no elements of injustice or oppression and there are no elements of deceit.[19]

Therefore, joint tenants have the choice of signing joint tenancy contracts or tenancy-in-common contracts throughout their lives. Both arrangements for joint ownership offer benefits. By choosing one of the aforementioned options, the owners agree to meet the conditions set out and the objectives of each of these agreements that they had made during their lifetime.

THE APPLICATION OF CONCEPT OF JOINT TENANCY IN AUSTRALIA

Australia was settled by the English, albeit as a penal colony. Because English law was deemed to be applicable to Australia as a matter of common law principle, Australian land law was thus imported from English law. Australian land law was derived from English law, most of which was based on English feudal history and had no real bearing on Australian society.

The advent of the Torrens system of title registration was the most notable advance. The system of registering and recording land ownership was revolutionised by the South Australian invention known as Torrens Title. In this system, the moment a document transferring ownership of the property is submitted with the local Land Titles Office, the land ownership is occurred.

The common law recognised four types of co-ownership: joint tenancy, tenancy in common, coparcenary, and tenancy by the entireties. A tenancy by the entireties is a common-law form of ownership that exists between husband and wife only. It arose from any conveyance to a married couple unless limiting language was included. This form of ownership is similar to the common law joint tenancy except that neither tenant could voluntarily terminate the tenancy or convey his or her interest without the consent of the other.[20]

The joint tenancy and the tenancy in common retain relevance in Australian law. There are two forms of co-ownership, namely joint tenancies and tenancies in common. The distinguishing feature of a joint tenancy is that on the death of one joint tenant his interest in the land passes to the other or others by right of survivorship. For there to be a joint tenancy, the four unities must be

present. There must be the unity of possession (each co-owner is as much entitled to possession of any part of the land as the others); unity of interest (each joint tenant has the same interest in extent, nature, and duration); unity of title (each joint tenant must claim his title under the same act or document); and unity of time (the interest of each tenant must vest at the same time). With tenancy in common, the tenants hold undivided shares, there is no right of survivorship, and only the unity of possession is essential.[21]

If a joint tenant severs the joint tenancy by transferring their interest to another, the four unities are broken and the joint tenancy is converted to a tenancy in common in equal or 'aliquot' shares. This is different from a typical tenancy in common, where co-tenants hold separate interests to the same land, often in unequal shares.

The continued existence of a joint tenancy and therefore the operation of the right of survivorship depend on the preservation of the unities of time, title, interest and possession. However, during his or her lifetime, a joint tenant 'is at liberty to dispose of his [or her] own interest in such a manner as to sever it from the joint fund and convert the joint tenancy into a tenancy in common (*Williams v Hensman*).[22] Severance of a joint tenancy, without physical partition, operates by converting the undivided rights subsisting in the whole of the property into distinct but undivided shares. Since the interests of each joint tenant are always the same in respect of possession, interest, title and time, no distinction can be drawn between the interest of any one tenant and that of any other tenant.[23]

There are three ways that a joint tenant may sever the joint tenancy, so that there is separate property to convey or give. First, in some circumstances there may be severance by unilateral action. Second, severance can occur by mutual agreement. Last, there may be severance by any course of dealing sufficient to intimate that the interests of all were mutually treated as constituting a tenancy in common. McNamee decided that a joint tenant could unilaterally sever the joint tenancy by assignment of the jointly owned property, being a chose in action, a debt, to herself by deed poll. However, it is by the second and third means of severing a joint tenancy that joint tenants achieve that outcome by making mutual wills. Historically, this occurs where mutual wills deal with an interest in real estate in a manner inconsistent with ownership of the real estate interest passing by survivorship.[24]

Parties who own property as joint tenants mean that all joint tenants have equal ownership and interest in the property, and a right of survivorship exists. Eventually, if one of the joint tenants dies, the property will automatically pass to the surviving joint tenant. This happens regardless of any contrary intentions in the will of the deceased owner.[25]

Joint tenants are frequently married couples or long-term partners. In other property ownership arrangements when all parties are happy with the right of survivorship, joint tenancy is a type of ownership that can be utilised.

The concept of joint tenancy depending on the 'gamble of the tontine' (as Deane J called the right of survivorship in *Corin v Patton*,[26] there may be nothing for the joint tenant to give on death. When the joint tenant comes to make their will, he or she may want to change that outcome by ending the joint tenancy.[27]

The right of survivorship is not a 'right' in any legal sense. It is merely a hopeful gamble and a consequence following the death of a joint tenant. Nor does it involve a vesting by survivorship because there is no shift in ownership. When one joint tenant dies, his or her interest ceases to exist. Deane J said:

> *"When one joint tenant dies during the subsistence of the joint tenancy, his interest ceases: the interests of the remaining joint tenants expand by accretion. When there is but one survivor, the joint tenancy has run its course and the survivor becomes the full owner of the whole property."*[28]

By completing the necessary form and submitting it to the responsible government agency, a joint tenancy may be terminated. When one or more of the joint tenants (but not all of the joint tenants), transfers all their interest in the property, this transfer does not affect the shares of a registered joint tenant who is not part of the transfer.

In New South Wales, the concept of joint tenancy was acknowledged in the Real Property Act 1900 (NSW). Under Section 97(1), for the severance of joint tenancy by unilateral action (without notifying others who may be affected by the action and seeking their agreement), the registration of a transfer by a joint tenant of their interest in land as a joint tenant, severs a joint tenancy. The law provides that the Registrar may require that person to provide the Registrar-General with further information before recording. Section 97 provides that such information to be sought by the Registrar-General includes the names and addresses of the other joint tenants, a statement that they are not aware of any limitations or restrictions on their entitlement to sever the tenancy and anyone else who may be affected. Once it has been lodged, the Registrar-General must then give notice of the severance to all other joint tenants except in certain circumstances. [29]

DISCUSSION AND THE RECOMMENDATIONS

From the above discussion, this demonstrates that the National Land Code (Act 828) does not recognise joint tenancy. The study assumes that a legal framework

or mechanism should exist to regulate the application of joint tenancy when dealing with joint ownership of land in Malaysia.

Joint tenancy is proposed as a solution to issues that frequently arise following a spouse's passing regarding the security of the widow and children. Such concerns are common in today's world, thus solving them will demand serious measures. For instance, the Malaysia Gazette News Portal reported on February 20, 2020, that disputes between Nor Hidayah, the deceased's widow, and the deceased's family members started to surface soon after the death of a popular comedian Abam, also known as Syed Umar Mokhtar Syed Mohd Ridzuan. The younger brother in this case, Ali Puteh, made the decision to assume control over the deceased person's property and eventually set up the requisite procedures to apply for the faraid system of property distribution through a Syariah court. The difficulties encountered by Nor Hidayah and her 9-month-old child after Abam's death captured the attention of people all over the country, particularly after social media disclosed the disputes regarding his late husband's belongings. Nor Hidayah stated that after her husband passed away, she was left with nothing and that it was difficult for her to travel around after the family took away the car and other belongings.[30]

Another case involving celebrity in Malaysia involves the son of comedian AR Badul, who passed away on September 4, 2019, in Kem Kok Lawi, Sabah. After Mohd Zahir passed away, AR Badul got in touch with the wife to assert his claim to the estate of his son. Shafinar, the deceased wife, opted to stop all calls from her father-in-law and the siblings out of frustration and pressure.[31]

The welfare of the decedent's family can be secured by offering joint tenancy as a method of estate administration. Additionally, there is a need to raise public awareness to concern on moral and financial support as well as maintenance of the deceased's family. Thus, family disputes on the deceased's property can be prevented.[32]

Therefore, it is anticipated that the application for joint tenancy would provide the owner more flexibility in deciding how to handle his property and would properly grant the surviving joint tenant the right to full enjoyment of the property. However, it must be noted that the application of the concept of joint tenancy must be compatible with Muslim law and the law of succession in order to meet present needs.

CONCLUSION
To conclude, the research explores the application of joint tenancy in Malaysia by discussing the concept of joint tenancy under the National Land Code (Act 828) and its application in Malaysia under the civil law of general application and the Islamic law of inheritance. Additionally, the study investigates joint tenancy legislation and practise in Singapore and Australia under the dual legal system

and the Torrens system, respectively. It is assumed that applying joint tenancy would allow the owner more flexibility in deciding how to manage his property and would fairly give the surviving joint tenant the advantage of being able to use the property to its fullest extent. The study concluded that it is high time for Malaysia to regulate a contract or conveyance of land by way of joint tenancy in dealing with joint ownership of land in Malaysia. However, it must be noted that the proposed legal framework must be in tandem with the current needs, and existing law and consistent with the Islamic law of succession, as the case may be.

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HOUSING AFFORDABILITY STRESS AMONG THE MIDDLE-INCOME (M40) GROUP IN JOHOR BAHRU

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Abstract

A house as a place of residence plays an important role towards sustainable development and in improving the wellbeing of the population. The issue of housing, especially the supply and demand of low and low-medium cost housing in cities, rising house prices, quality of housing as well as housing stress has shown that housing is a critical issue that must be addressed. Housing stress usually refers to financial constraints, the reason for the inability to manage the cost of home ownership and housing expenses. Yet financial burden is not the only factor that can contribute to housing stress. There are two types of housing stress, namely physical and emotional factors that may impact negatively on the lives of residents. This paper discusses the affordability housing stress among the middle-income group (M40) that may contribute to housing stress based on a survey of 100 residents of the M40 group in Johor Bahru. The paper discusses the ability of households to rent or buy a house by considering affordable prices, the ability to repay financing, and sufficient income to meet the basic needs of life and a household.

Keywords: Affordability, housing stress, middle income group (M40), income, housing price

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INTRODUCTION

The issue of housing affordability is commonly associated with people of lower and middle incomes. This focus is in accordance with a concept in Malaysia's National Housing Policy known as "1 Keluarga 1 Rumah". This policy's goal is to provide adequate affordable housing for all people, particularly low-income, middle-income and other targeted groups.

Malaysians have a median income of RM 4,500 according to the Department of Statistics Malaysia (2014), showing that households cannot afford to purchase a house for more than RM 300,000 (Samad 2016). However, the cost of houses now exceeds affordability, especially for and M40 age groups, with prices ranging from RM 300,000 to RM 500,000 (NAPIC 2020). Furthermore, the number of houses the middle class is dwindling. According to Yusof (2019), low-cost housing units account for just 3.9% proposed by developers in completed urban areas. This means that the overall number of houses on the market is already inadequate to satisfy existing demand.

Based on the Department of Statistics Malaysia (2020), the average income for the M40 group in 2016 and 2019 was RM 9,619 and RM 10,959. While in Johor in 2016 and 2019 it was RM 6,890 and RM 10,879 (Department of Statistics Malaysia 2020). The 11th Malaysia Plan outlined that the M40 group is the driver of the country's progressive economic and social growth (Mohamed et al. 2020). Therefore, the problem of M40 housing ownership needs to be taken seriously to help this group own their own homes. Houses are considered affordable by the M40 group if they cost less than three (3) times the average annual income, according to studies by Hassan et al. (2019) and Kasmori (2018). As a result, the M40 group's affordable housing ranges from RM 225,900 to RM 250,000.

The problem faced by the M40 group is in terms of the provisions of the current Malaysian housing policy which focuses more on efforts to provide housing for the lower class without making efforts to provide affordable housing to the M40 group (Baqutaya et al. 2016). Furthermore, according to Melati et al. (2019) and Zamri (2020), the mismatch between supply and demand for affordable housing by the M40 group contributes to the problem of housing affordability stress. The M40 group also contends with the constant rise in house prices from year to year, especially in urban areas (Baqutayan 2014). Therefore, this paper intends to fill this research gap and investigate the issue further. This paper will study the level of affordability for the M40s to own a house. It will look at factors that influence M40 housing affordability stress to own a house, and the relationship between levels of affordability with factors that influence M40 housing affordability stress to own a house.

LITERATURE REVIEW
DEFINITION OF M40
Middle-income households known as the M40 group, is a group that shares the same percentage with the total number of low-income households which is 40% Melati 2019). According to the 11th Malaysia Plan Report, the "M40 households" group is a middle-income 40% household, which refers to households earning between 41% and 80% of the national income distribution as a whole. Table 1 below shows the income classification distribution in Malaysia.

Table1: Income Classification

B40				M40				T20	
B1	B2	B3	B4	M1	M2	M3	M4	T1	T2
Less than RM2,499	RM2,500 - RM3,169	RM3,170 - RM3,969	RM3,970 - RM4,849	RM4,850 - RM5,879	RM5,880 - RM7,099	RM7,110 - RM8,699	RM8,700 - RM10,959	RM10,960 - RM15,039	More than RM15,039

Source: The Department of Statistics Malaysia (2019)

HOUSING AFFORDABILITY
According to Bujang et al. (2010), affordability is a person's willingness to provide something, which is sometimes referred to as a person's financial ability. It shows the people's financial ability to buy or rent a home. According to Anirban et al. (2006), housing affordability is a state in which people may save a larger income to buy a house while still paying for other expenses during their working years. Household incomes and expenditures are used to determine housing affordability. This idea involves a variety of topics, including housing price distribution, home quality and income, household borrowing capacity, government regulations, and housing market circumstances (Linneman & Mebololugbe 1992).

The ability to repay all of the costs involved in the process of purchasing a house is indicated by an individual's income and ability to repay all of the costs included in the process of buying a house (Whitehead 2009). According to Suhaida et,. al (2011), housing affordability is one of the most important indicators of a country's socioeconomic stability and growth. Housing affordability is to ensure that housing is affordable to people of all income levels, whether they are low-income, middle-income, or high-income. Housing has been recognized by the Malaysian government as a basic human necessity and an essential component of the urban economy. The My First Home Scheme programme allows young people earning less than RM3,000 per month to get a 100 percent loan for a housing cost between RM100,000 and RM220,000 with a 30-year repayment period.

HOUSING AFFORDABILITY STRESS

Housing affordability stress, according to Bujang (2006) and the United States Department of Housing and Urban Development (2002), is defined as a family spending more than 30% of their income on housing and having difficulty meeting basic needs such as food, clothing, transportation, and medical care. The 30:40 rule, which claims that a person is under housing stress if housing expenditures exceed 30% of the household income and they are in the lowest 40% of the income distribution, is a widely used measure of housing stress, according to Yates (2007). The best measure for measuring home affordability stress, according to Marks and Sedgwick (2008), is gross income; however, Stone, Burke and Ralston (2011) suggest that purchasing power is the best predictor. According to Yates (2006), low- income groups, teens, households with only one adult, and tenants are among those who face housing affordability stress and financial difficulty.

Housing affordability stress and housing affordability in an environment of sufficient income, according to the Australian Housing and Urban Research Institution (AHURI) (2012), households should not bear the unreasonable housing cost on their income, based on the concepts introduced by MacLennan and Williams (1990). According to Yates (2007), if a low- income household spends at least 30% of their income on housing, the condition is referred to as housing affordability stress.

FACTORS INFLUENCING HOUSING AFFORDABILITY STRESS

There are factors of variables that have had a significant influence on housing affordability stress, including:

a) Housing Price

Rising house prices, among other financial indicators, have added to the M40's desire to buy a home. The majority of big metropolitan areas have seen a rise in home prices and rentals, and this pattern is projected to continue year by year (Nooriah & Jamaluddin 2018). Housing prices in Malaysia have risen rapidly in recent years, with this upward trend emerging mostly in urban areas. Furthermore, in most countries including Malaysia, the problem of quality housing availability in terms of price and efficiency, as well as increasing housing prices, has become a major concern (Noriah 2019).

b) Deposit

Problems in accessing down payments for home purchases put households under stress. Since they do not have enough savings, certain households are required to put a 10% down payment on a house. Not just that, but the M40 group's difficulty in accessing a loan has put them under housing affordability stress. The issue

regarding M40 housing loans is that they have to compete with high loan interest rates, which makes it difficult for the M40s to make loan repayments (Baqutaya et al. 2016). Furthermore, strict requirements for securing a housing loan have a significant impact on the M40's ability to access it (Tukiman 2014).

c) Cost Of Living
According to Zulkiply (2016), Malaysia's monthly household income was RM 3,250 in 2004 and RM 6,141 in 2014; an increase of 89% in 10 years. According to the Consumer Price Index (CPI) of the Malaysian Department of Statistics, the market grew by 29% over a 10-year stretch, from 2005 to 2015. Prices are rising at a slower rate than household incomes have increased. This means that if a household's consumption habits do not change, the rise in costs would force the household to deal with the stress of insufficient revenue. The result would place indirect pressure on households for struggling to fulfil the requirements to purchase and afford their own homes.

d) Income
The purchasing power factor is the amount of money and ability to select on a monthly basis. The purchasing power of an individual has an impact on their ability to own a house. Income level is one of the indicators in buyers' selection of residential goods, according to Majid et al. (2012), because it can generate demand for the right to own a home in accordance with local living standards. This is because household income is one of the factors that influence their decision-making and willingness to pay for a home that satisfies their needs and wants (Ismail 2020).

The M40 group's housing affordability stress is also closely related to financial or income hardship (Rowley & Ong 2012). The effect of increasing costs of living and daily expenses has resulted in households being unable to afford to buy a home (Yates 2007). Hulse et al. (2010) looked at indices of financial distress on household spending, such as the failure to pay bills on time. According to Yates (2007), households in housing affordability stress are categorised as being in certain (high) financial stress if they show one or more indicators of financial stress in household spending.

e) Loans
High monthly instalment payments become a burden to borrowers to buy a home. Most individuals lose their homes because they had to be auctioned off due to an inability to pay high monthly instalments (The Standard Bank of South Africa 2010). One of the measures used by banks in determining whether a person is able to repay a loan is the amount of loan payments. The monthly instalment must not exceed one-third of the total income of a borrower.

f) Interest

According to Holt (2007), increases in house prices, loan interest rates, utilities and property taxes have a correlation with the level of affordability as well as home purchase. However, according to McCord et al. (2011), the right to own a home can be classified into two concepts, namely the ability of first-time buyers to purchase a home and the ability of households to retain home ownership by repayment of borrowed funds.

The loan interest rate consists of the Base Lending Rate (BLR) which will be mixed with the interest rate charged by the profit margin by the bank. BLR is the minimum interest rate calculated by a banking institution based on its basic formula and taking into account the cost of institutional funds and administrative costs. The BLR rate is set by the Central Bank of Malaysia. Based on a report released by Bank Negara Malaysia, the current BLR rate is 6.6%.

METHODOLOGY

Primary and secondary data are used in this study to achieve the paper's goal. To collect primary data, a questionnaire was distributed throughout the demographic research region. Secondary data was gathered from journals, articles, conference papers, books, the internet, newspapers, and other related publications.

Identification of topics was followed by a literature review, a case study, data collection, analysis, and interpretation of research findings. Questionnaires were used to collect primary data from respondents, while literature reviews were utilised to collect secondary data for the study. The formula of Taro Yamane (1973) was used to estimate the number of respondents for the study. The level of confidence in this calculation is 90% of the total population of 392,000 people. The minimum number of responders or sample size required, according to the Taro Yamane formula, is 100 people. The questionnaires, on either side, were distributed at random and 100 were returned. Frequency, Likert Scale, Cross Tabulation, and Correlation Analysis were used to examine data in this study. SPSS (Statistical Package for the Social Sciences) software was used to analyse all the data collected. For 'ranking' and the degree of importance among the factors, frequency analysis and Likert Scale were used. The relationship between income and the level of affordability for M40s to own a home was analysed using cross tabulation analysis. Meanwhile, significant relationships between variables and household incomes were identified using the Pearson's Chi Square analysis and correlation analysis.

ANALYSIS AND RESULT

The survey questionnaire is divided into 4 parts and analysed using the procedures described above. The results and findings of the study were then split into four categories. The first section contains information on the respondent's socioeconomic situation, followed by the level of housing affordability, factors

that influence housing affordability stress with M40s, and finally, the relationship between factors with income.

The result in respondent profile analysis shows that the majority of the respondents were Malay, aged between 31 and 45. Most are from government and private sectors with medium and higher educational backgrounds.

Table 2 shows the analysis on respondent's housing status, and Table 3 shows their monthly income level.

Table 2: Housing Status

Homeownership	Frequency	Percentage
Own	72	72%
Rent	28	28%
Total	**100**	**100%**

Table 2 shows most of the respondents have their own home (72%), while 28% of respondents are still renting. From Table 1, it can be concluded that more than half of the M40 respondents in this study are able to own their own house and the rest are still unable to buy and own their own house.

Table 3: Monthly income level

Income	Frequency	Percentage
RM4001-RM4500 RM4501-RM5000 RM5001-RM5500 RM5501-RM6000 RM6001-RM6500 RM6501-RM7000 RM7001-RM7500 RM7501-RM8000 >RM8000	10 11 7 7 8 5 3 2	10% 11% 7% 7% 8% 5% 3% 2%

Table 3 shows the majority of the respondent's (35%) monthly income is above RM 8,000, 11% of the respondents have an income between RM 4,501 and RM 5,000 and 10% between RM 4,001 and RM 4,500. From Tables 2 and 3 above, it can be concluded that most of the respondents have a stable income.

Table 4: Relationship between Household Incomes and Types of Affordable Housing

Income		1-storey house	2-storey house	Semi-D	Condominium	Apartment	Bungalow	Townhouse	Lower Cost Flat	Quarters	House Village	Total
	RM4,000-RM4,500	5	3	0	1	0	0	0	3	0	0	12
	RM4,501-RM5,000	5	1	0	2	0	0	0	0	2	2	12
	RM5,001-RM5,500	5	1	0	0	1	0	0	1	0	1	9
	RM5,501-RM6,000	6	2	0	0	0	0	1	0	0	1	10
	RM6,001-RM6,500	4	3	0	0	0	0	0	1	1	0	9
	RM6,501-RM7,000	1	0	0	1	0	0	0	1	0	0	3
	RM7,001-RM7,500	1	2	0	0	0	0	0	0	0	0	3
	RM7,501-RM8,000	1	1	0	0	0	1	0	0	0	0	3
	>RM8,001	7	13	12	2	1	0	2	0	2	0	39
Total		35	26	12	6	2	1	3	6	5	4	100

Table 4 shows the analysis using cross tabulation on the relationship between household incomes and affordable housing, while Table 5 shows the relationship between household incomes and affordable housing prices. As shown in Table 4, the majority of respondents who prefer to own either single or double storey houses are those with a monthly income of RM 8,001 and above. In addition, those who earned between RM 4,001 to RM 5,000 also prefer to buy single or double storey houses. Thus, it can be concluded that monthly income, housing market price and types of housing are interrelated between one another when considering respondent affordability.

Next, Table 5 will show the housing price preferred by the respondents based on their income levels.

Table 5: Relationship between Household Incomes and Affordable Housing Prices

Income		Housing Prices								Total
		<RM100,000	RM100,001-RM150,000	RM150,001-RM200,000	RM200,001-RM250,000	RM250,001-RM300,000	RM300,001-RM350,000	RM350,001-RM400,000	>RM400,001	
	RM4,000-RM4,500	2	1	5	4	0	0	0	0	12
	RM4,501-RM5,000	3	1	5	2	0	0	1	0	12
	RM5,001-RM5,500	3	2	2	1	0	0	0	1	9
	RM5,501-RM6,000	5	0	0	2	1	0	2	0	10
	RM6,001-RM6,500	2	2	2	1	0	1	0	1	9
	RM6,501-RM7,000	2	0	1	1	1	0	0	0	5
	RM7,001-RM7,500	0	0	0	1	1	0	0	1	3
	RM7,501-RM8,000	0	0	0	0	1	1	0	1	3
	>RM8,001	0	1	8	7	7	3	5	8	39
	Total	**17**	**7**	**23**	**19**	**11**	**5**	**8**	**12**	**100**

The result from Table 5 shows that most respondents with monthly incomes of RM 8,000 and above can afford houses between RM 150,000 and RM 250,000. As a conclusion, housing affordability may be determined based on the house price they can afford to buy and their income. Average house prices, for example, relate to average earning incomes, but lower quartile earnings correlate to lower quartile house prices.

Table 6: Factors influencing housing affordability stress in M40s to own a house

Scale Categories	Index Range	Factors Influencing Affordable Housing Stress among M40s	Min
Strongly Influential	4.27 – 4.41	Economic factors	4.41
		Demographic factors	4.27
Influential	4.13 – 4.26	Environment factors	4.18
Natural	3.99 – 4.12	Housing market factors	4.10
		Housing stress factors	4.08
Uninfluential	3.85 – 3.98	Social factors	3.87
Strongly Uninfluential	3.71 – 3.84	Housing needs factors	3.84

From the analysis carried out in Table 6, the most influenced factor for housing affordability stress among M40s is the economic factor which is too high, with a total score of 4.41. Demographic factor is recorded as the second highest factor that influences this problem, with an average score of 4.27. The next factor is the environment factor with a total score of 4.18. From Table 6, it can be concluded that the social factor and housing need factor have not influenced housing affordability stress in M40s to own a house.

The Pearson Chi-Square test was then utilised to study the relationship between group frequency differences, homeownership, and housing affordability; influencing factors that are all linked (Bujang 2010). The study of the factors that influence housing affordability and income is shown in Table 7.

Table 7: Summary of Analysis on factors that influence the housing affordability stress in M40s and income by Using Pearson's Chi-Square

		Asymp.Sig.	Relationship
	HOUSING NEEDS		
a)	High cost of living	0.01	Significant
b)	High monthly payments over 30% of income	.000	Significant
	ECONOMIC FACTORS		
a)	Rising house prices	.038	Significant
b)	Installments are too high for a suitable and desirable home (low purchasing power)	.002	Significant
c)	The supply of M40 housing is small	.021	Significant
d)	The home financing loan process is difficult and tight	.002	Significant
e)	High interest rates	.001	Significant
f)	Long repayment period	.027	Significant
	ENVIRONMENT FACTORS		
a)	The quality of the house offered affects the price of the house	.022	Significant
b)	The basic facilities provided require the payment of high management charges	.024	Significant
	HOUSING STRESS		
a)	Physically and emotionally disturbed and are influenced by the environment	.000	Significant

Table 7 shows the results of Pearson's Chi-Square analysis on the factors that influence housing affordability stress in M40s to own a home. This sort of analysis requires a significant value of less than 0.05 (Tasir & Abu 2005). Based on the above analysis it is concluded that only 12 factors have significant value which is less than 0.05. Thus, it can be concluded that these 12 factors are the most influencing factors on the housing affordability stress in M40s to own a house.

According to the results of the Bivariate Correlation, there is a strong correlation between the 10 factors that influence the housing affordability stress in M40s to own a house. The baseline set of 0.01 is much less than the majority of the factors that have been correlated. As a result, it is possible to conclude that all of the factors are related to previous studies.

FINDINGS

Based on the analysis and literature review, we can conclude that house prices influence the M40 group's affordability to own a house. House prices determine an individual's willingness to pay the price established by the market or developer, according to Gwin and Ong (2004). In addition, the number of households has an influence in M40's affordability to own house.

In this case study, a majority of M40s in Johor Bahru have a stable income with their monthly income between RM 4,001 and RM 8,000 and above. However, M40s have a stable income but most of them choose house price as one of the main factors when considering to buy a house, as it is highly dependent on their monthly income. Their affordability to buy and own a house is within the price range of between RM 150,000 to RM 250, 000, either single or double storey. For M40s who earned less than RM 4,000, they can also afford to own the same style of house, but with a price of below RM 150,000 per unit. Thus, it can be concluded that the majority of housing affordability for M40s in Johor Bahru depends on the type of house, which are single storey terrace houses and double storey terrace houses, with prices ranging between RM 150,000 to RM 250,000 per unit.

Factors influencing housing affordability stress in M40s in Johor Bahru are economic, demographic and also environment factors. Economic factors are rising house prices, deposit, expenses pattern, interest rates and payment period have contributed to the M40's stress to own a home. An increase in the cost of housing will simultaneously increase house prices and put stress on households to buy and own their own homes. As the number of households increase, so does the cost of daily necessities for the whole family. With a fixed amount of income, but an increasing number of households, indirectly puts stress on the head of the family to cover expenses for the whole family. Thus, it can be concluded that the housing needs, social factors, housing market and also stress do not really influence the housing affordability stress in M40s at Johor Bharu to own a house.

CONCLUSION

Due to the high cost of living in Johor Bahru, the results of the analysis and conclusions of the study show that the level of housing affordability of M40 households is lower than the acceptable eligibility in terms of house prices and types of houses. The affordability level of M40 housing in Johor Bahru is one-storey and two-storey terrace homes with a price not above RM 250,000, as

shown by the large number of respondents who have either purchased or do not yet own a property. Considerations in determining the M40 housing affordability stress must take into account economic, demographic and also environmental factors as these three factors affect the M40 housing affordability stress in Johor Bahru. In this regard, the government needs to improve their policy of setting the maximum price of houses in the market between RM 300,000 and RM 400,000. This needs to be re-evaluated with the needs and actual income of M40 households to ensure success and realise the goals of the National Housing Policy.

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REVIEW OF RISK MANAGEMENT IN RENT TO OWN (RTO) SCHEME IN MALAYSIA

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Abstract

This paper focuses on the review of risk management in Rent to Own (RTO) scheme in Malaysia. The objectives are to review the risk management factors in RTO scheme and the strategies to overcome the risk. This study employs a desktop study by collecting the research papers and data in the online databases. RTO Scheme is a concept that employs the rental market like Private Rented Sector (PRS) in the properties that allows ownership after the tenancy period has been expired. The RTO scheme is a type of financial schemes that allows property leasing for between twelve (12) months to five (5) years and ownership upon the maturity of the leasing period. This is an initiative by the Economic Planning Unit (EPU) and the Ministry of Housing and Local Government (MHLG) to implementing the National Housing Policy 2018-2025. The RTO scheme is for home buyers to have financial planning to rent before they buy. The calculation of the mortgage loan for RTO Scheme is based on the rental income and the rental deposit. Additionally, preliminary case study has been conducted to the RTO schemes through onsite and interview with the Developer. The results are to review the risk factors in the RTO Scheme and the marketing strategies. The outcomes of the research are to give input to the house buyers to be confident to buy houses under the RTO Scheme.

Keywords: Rent to Own Scheme; Risk Management; Financial Institutions; and Housing Developers

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INTRODUCTION

In Malaysia, there are many initiatives by the Economic Planning Units (EPU) and Ministry of Housing and Local Government (MHLG) to implement different types of housing policy and regulations (James, 2016; Rahah I., Yasmin M. and et. al, 2020). The purpose to introduce these types of housing regulations and policy is to ensure that the house purchasers are encouraged to buy and own affordable houses (Rahah I., Yasmin M. and et. al, 2020).

The examples of housing policy are maximum loan to ratio of 70% to be applicable to third house financing facility taken by a borrower, loan approval based on Net Income, Maximum tenure of 35 years for financing residential & non-residential properties, abolishment of Debt Interest Bearing Scheme (DIBS) loan margin for the third house, My Deposit, the Home Ownership Campaign (HOC) and the Rent to Own (RTO) Scheme. This are good initiatives from the EPU, MHLG and Bank Negara to implement different types of housing policy and regulations for the home buyers to buy at the affordable level (James, 2016; Rahah I., Yasmin M. and et. al, 2020; Ecoworld, 2019; JPN & KPKT, 2018).

The objectives of this research paper are to explain the RTO schemes in Malaysia and to determine the risk factors associated in the RTO Schemes. Moreover, the strategies to mitigate the risk factors will be discussed in the conclusion in order to overcome the risks associated in the RTO Schemes (Francesco, et. al., 2019).

LITERATURE REVIEW
OVERVIEW OF THE RENT TO OWN (RTO)

The term Rent to Own (RTO) scheme is a type of Home Financing in the Financial Institution accessible by the households or individuals to own accommodations for a stable state of homeownership (Lum, 2017; Ecoworld, 2019; Gregory and Lim, 2022). Rent to Own scheme is a home financing scheme for the different target groups who desired to purchase houses under an affordable housing scheme (Lum, 2017; EPU, 2021). The Rent to Own Scheme are implemented under the National Housing Policy 2018-2022 (JPN & KPKT, 2018).

Moreover, since the Asian Financial Crisis and US Subprime Crisis in Year 2007 the property market in Malaysia encountered property market mismatch. This property market mismatch causes the house prices and transaction volume are imbalanced from Year 2015 to Year 2022 (James, 2016; Rahah I., Yasmin M. and et. al, 2020; Suraya I. and et. al., 2021; EPU, 2021).

Therefore, the chances to own a house are more difficult because of the tighter financing measurement by the Bank Negara to curb the speculation in the Property Market (Rahah I., Yasmin M. and et. al, 2020; Tuti, H. and Ezdihar, H., 2021; Suraya I. and et. al., 2021).

In Malaysia, developers are facing difficulty to sustain in the consistent growth of their property sales rates and take up rate because of the property market imbalance. The impact of the higher house prices and lower transaction volumes among the housing development projects have caused an impact to the supply and demand of the houses by the housing developers in Malaysia (Rahah I., Yasmin M. and et. al, 2020).

Subsequently, majority of middle-income group earners between RM25,000 to RM75,000 per annum are the most people that are affected in this property market mismatch. Although the government policy and regulations have been long implemented and controls to the property market, there are still more room to improves in building affordable housing to the Nations, due to the factors of land scarcity, speculation, increase in material costs and workmanship, increase in the living costs and expenses etc. (James, 2016; KRI, 2017; Rahah I., Yasmin M. and et. al., 2020; Suraya I. and et. al., 2021).

Therefore, in 2015 the MHLG has introduce the ideas of RTO Scheme in the Twelfth Malaysia Plan (Twelfth Plan) and subsequently implemented in the National Housing Policy (NHP) 2018-2022. In Year 2018, the RTO scheme was officially launch by the Maybank Group to offered the financing scheme that are suitable to the middle-income group house owners.

The RTO scheme were introduced to the public in early 2018 and the scheme is first initiated with a pilot launch introduce to the bank's employees. The RTO scheme organized by the bank is called HouzKEY with a RM1 billion portfolio size for the scheme. The HouzKEY is an alternative method of home financing by way of lease arrangement based on the Islamic concept of Ijarah (lease) that provides customers with the option to purchase the property (Lum, 2017).

Furthermore, the National Housing Policy between Year 2018 to 2025 and the National Affordable Housing Policy (NAHP) introduced by the Ministry of Housing and Local Government will subsequently improves more homeownership of the Nation (James, 2016; Rahah I., Yasmin M. and et. al, 2020; EPU, 2021). Meanwhile, the house financing schemes introduced in the National Housing Policy 2018 to 2025 will assist the category of B40 and M40 households to own a house in Malaysia (EPU, 2021).

The housing financing schemes are referring to Rent to Own (RTO) Schemes. This RTO Schemes covers the houses priced up to RM500,000 and below for the public housing and for private housing between RM500,000 to RM1,000,000. The purchasers have the option to renting the property for a duration of twelve (12) months to five (5) years before choosing the option to purchase (EPU, 2021). There are Fund for Affordable Homes and Youth Housing Scheme for purchasing the first house.

The Financing House Scheme or commonly known in Bahasa Malaysia as "*Skim Pinjaman Perumahan*" in Malaysia will be strengthening to provide assistance to the households that own land to build affordable houses. The reason is newer financial model and attractive loan packages have been introduced into the real estate sector in order to increase the take-up rate. There are also efforts to be undertaken by the bank to assist the home owners in prevention of loan default payment and house being auctioned due to financial difficulties. The financial model is known as Murabaha to ijarah to Murabaha programme (own-to-rent-to-own), this is to allow owners to repurchase their property acquired by the bank (KRI, 2017; Rahah I., Yasmin M. and et. al, 2020; EPU, 2021).

Ownership of affordable homes by the category of M40 will be determined through collaboration between the state governments and the private sector. The property designated will be located at the strategic location and to facilitate the M40 income group earners. The RTO Schemes will be strengthened to provide the M40 with an option to own houses with affordable monthly instalments (KRI, 2017; Rahah I., Yasmin M. and et. al, 2020; EPU, 2021).

The RTO Scheme is to assist the house buyers to secure the homeownership with a high initial cost in the down payment. The function of the RTO scheme is to ensure the transparency of the house purchase through monthly payment commitment for the rental according to the chosen tenure. The RTO Scheme give the customers the opportunity to earn capital appreciation at a later stage at a pre-determined price. Moreover, the Rent to own scheme could reduce homeownership issues and enhance the opportunity for Malaysians to own a house they desired (Lum, 2017; Ecoworld, 2019).

The criteria of RTO scheme an example in HouzKEY are as listed as follows:

(a) Flat rental rate for the first five years of rental tenure and no penalty if termination after five years rental.
(b) There will be a 2% annual rent hike when the contract of leases entering into 6th year of the Rent to Own (RTO) arrangement.
(c) 100% stamp duty exemption for Sale and Purchase Agreement (SPA).
(d) Option for seamless transition into mortgage after minimum 12 months of renting.

The participating property developers including SP Setia Bhd, Eco World Development Group Bhd, Mah Sing Group Bhd, Gamuda Land and Sime Darby Property Bhd.

THE RENT TO OWN (RTO) SCHEME

The definition of RTO Scheme is for property rented for a temporary period for between 5 years to 10 years after signing the contract of leasing and purchase

Agreement with the developers. The down payment is the rental payment paid monthly to the banks. The RTO Scheme will be mature after the tenancy period of the Sale and Purchase Agreement (SPA) becoming maturity. Then the property will be transfer to the landlord as collateral for the property to the new purchases that have sign the Sale and Purchase Agreement (SPA) for Rent to Own (RTO). In between the Valuation sectors have to determine the amount of Market Value of the property and the rental rate that is feasible to the new purchasers (Ecoworld, 2019).

The RTO scheme is to ensure that after the new purchaser purchase the property there can secure the property without hassle to purchase, there have a period of time to consider to whether to transfer the ownership for renting to purchase from the Bank and the developers.

The RTO Scheme ease homeownership against the challenging financing requirement in Malaysia (Lum, 2017; Ecoworld, 2019). The purpose of the financing program is to overcome the speculation of property in Malaysia and to reduce the numbers of property overhang by introducing more financing accessible scheme to the home buyers. These RTO schemes provides more affordable home to the middle-income groups and the higher income group (Rahah I., Yasmin M. and et. al, 2020; Ecoworld, 2019; Suraya I. and et. al., 2021; Soo, 2022). RTO Scheme is to ensure the functional of the housing loan by deferred instalment plan in the mortgage loan (Ecoworld, 2019).

Table 1: Five (5) types of Rent to Own (RTO) Scheme from the developers.

No.	RTO Scheme	Tenancy and Purchase Option details
1.	Low initial cost	Only 3 months rental deposit (refundable).
2.	Low monthly payment	Monthly payments have been structured to be similar to the market rental rate – this makes it very affordable for aspiring new homebuyers.
3.	Stay First, Purchase later	Participants are able to live in the home immediately and experience the environment before making the big decision to purchase.
4.	Savings element from rental	The savings element from rental are as follows: i)At least 30% of the rental paid may be converted into savings when the Option to Purchase is exercised. ii)The rental savings will be used to offset part of the purchase price of the home making it even more affordable to own.
5.	Secure the property price & eliminate price fluctuation	The explanation are as following: i)Participants lock in the purchase price for the property today. ii)Option to Purchase exercisable after year 1 up to the end of Year 5 gives flexibility to decide when to buy. iii)Participants can switch to a traditional mortgage once he / she is ready to purchase and qualifies for a mortgage.

Source: Ecoworld (2019)

THE CALCULATION OF RENT TO OWN (RTO) SCHEME

Table 2 shows the calculation of the RTO versus the conventional mortgage:

Table 2: The calculation of RTO Scheme and compare to conventional mortgage.

Rent to Own Scheme calculation		HouzKEY	Mortgage
(1) Property amount	Sale and purchase Agreement (SPA) price	RM500,000	RM500,000
	Financing amount (include transaction costs for Houzkey)	RM517,500	RM450,000
(2) Transactional costs at first year	Deposit (10%)	RM 0	RM50,000
	Transactional costs (Legal, stamp duty, etc)	RM 0	RM17,500
	Security deposit (3 months rental)	RM8,193	RM 0
	Total initial cost per customer	RM8,193	RM67,500
	Initial cost as a % of SPA purchase price	2%	14%
(3) Payment for the first 5 years	**Monthly rent/instalment**	**RM2,731**	**RM2,280**
	5 years accumulated payments	RM163,860	RM136,800
TOTAL PAYMENT IN 5 YEARS		**RM172,052**	**RM204,300**
INITIAL SAVINGS UNDER HOUZKEY		**RM32,248**	

Source: Lum (2017)

THE REQUIREMENTS AND PROCESS OF RENT TO OWN SCHEME TO THE PURCHASER

According to Lum (2017) and Ecoworld (2019), the requirement to obtain the housing loan under the Rent to Own Scheme with reference to the bank requirements are firstly, the house purchaser must be a Malaysian citizen or a Permanent Resident of Malaysia. The recipient must not exceed 65 years old and not below 18 years old during the date of application. The applicant and his spouse must have combined household gross income of at least RM5,000 per month or RM60,000 per annum. The house buyers for RTO Scheme have to appoint at least one (1) guarantor of their closer family members like their parents, siblings, spouse or children to become their RTO Scheme's guarantor and the numbers of guarantor shall not exceedingly more than 3 persons.

Apparently, the guarantor and the borrower cannot own more than a house that is mortgaged to the Financial Institutions during the date of application of RTO Scheme because this is the special requirements to secured the housing loan for the RTO Scheme. The process of application of RTO Scheme to the Purchaser and the approval process are based on the systematic guidelines provided by the Financial Institution like requirement to login to their bank's website to obtain the name lists of properties that are offering the RTO Scheme. Through the evaluation, the purchaser has to choose their ideal home from the RTO Scheme's house project and make a joint inspection to the Sales Gallery to collect data and brochures before deciding to purchase.

Moreover, they have to consider types of houses that are suitable to their family size and the location to their working area. The application process is simple because the applicant should just submit their electronic application form and providing their loan application documents. The application documents shall consist of the Identification Card, Income Tax Statement (BE Form), Borrower's Salary's Account Bank Statement of at least three (3) months to six (6) months, one year Employment Provident Fund (EPF) Statement and their proof of saving like other supportive documents in Fixed Deposit, Debenture, Unit Trusts Fund and other type of collateral like tenancy agreement for their stable income from tenancy of the house ownership.

Upon submission of the application for RTO Scheme the applicants have to wait for at least 1 to 2 weeks for the loan approvals provided their application were submitted with sufficient supportive loan documents. In the same time upon approval of the RTO Scheme for the housing projects the house buyers must go to the headquarters of the bank in the Klang Valley that offers RTO Scheme to execute the lease agreement in 7 days and make payment for security deposit (3 months rental). Thereafter, the applicants have to wait for the Notice of Vacant Possession (VP) for handover key or key collection before moving into the new house. The benefits of RTO scheme are there are no other amount of deposit that there required to pay in the initial stage of borrowing and they have to just serve the rental payment monthly and the 3 months rental deposit only.

Table: 3: Stages and Process of Rent to Own (RTO) Scheme

Stage	Classification	Process of Rent to Own Scheme
Stage 1	**Before Applying for RTO Scheme**	1. Search for the Homes
		2. Find a few homes that you like
		3. View Full Property Information
		4. Check out the house
Stage 2	**During utilization of the RTO Scheme**	5. Background Verification
		6. Signing of Lease Purchase Agreement
		7. Move in to the Home
		8. 24 months later (or at the end of your rent to own term)
Stage 3	**After Completion of RTO**	9. Down Payment and Home Loan
		10. Vacant Possession (Sold)

Source: Ecoworld, 2019; Lum, 2017; Soo, 2022

THE CHALLENGES AND ISSUES IN RTO SCHEMES
Business to Business Concept (B2B)

Conventionally, the developers are exploiting the dual marketing strategy in the housing market for business-to-consumer (B2C) through selling the housing and renting the house. In the same time, the business-to-business (B2B) concept formed in the property RTO scheme are introduced among the developers and the financial institutions to have more flexible mortgage loan to the purchaser (Chee, 2019; Francesco, et. al., 2019). The concepts of B2C in the traditional approach and the B2B of modern approach in the marketing in the Business of property industry have transformed the business concepts in the early years before 90s (Chee, 2019). The issue arise in this context are the adaptation of the developers changing from the traditional approach to modern approach.

An example of the flow chart showing the dual marketing concept in B2C concept of marketing the completed residential property development by way of a tenancy management and the marketing management. The Business to Business (B2B) concept is through initiatives to sell the property under RTO model under a contract of leasing and purchase option after 12 months to 5 years (golden timing) to become a homeownership and reduce of overhang projects. Indirectly, the housing mismatch can be balance with the implementation of the B2B concept in RTO model and the B2C dual marketing concept.
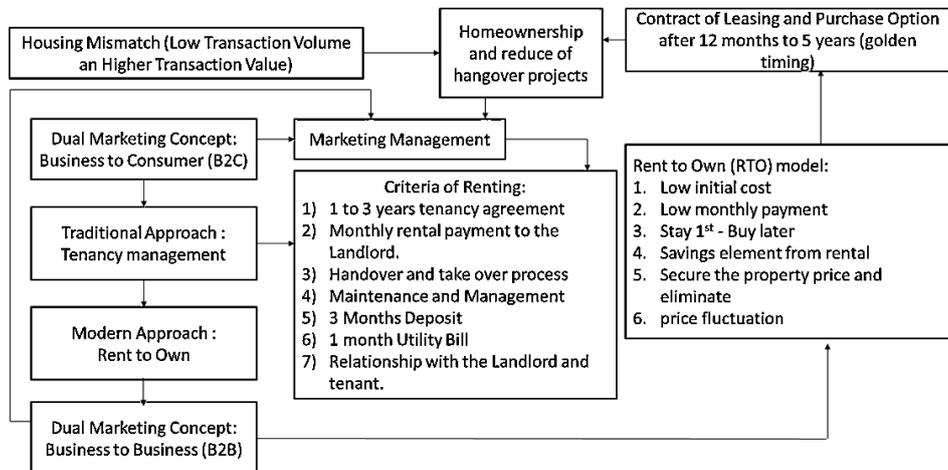
Figure 1: The Flow Chart of Dual Marketing Concept in Residential Property Market
Source: W.C., Chee (2019)

Lease First, Purchase Later

The Rent to Own (RTO) scheme is a process that involving the leasing of the property for a set of periods and a term between five (5) to ten (10) years before the property is agreed as a final sale (Fatimah, Z., 2020). The purchasers are required to sign the leasing contract with a guarantor for leasing and renting, the reason is the bank do not want the property have default payment in rental. A guarantor can become a person to follow-up for the rental debt when the potential purchasers ran away from paying the rental. Subsequently, the guarantor is responsible to payback the remaining debt owed to the developers and the banks. During the term of leasing, the property developers and the stakeholders are required to managing the property by a systematic and well-established Tenancy Administration (Francesco, et. al., 2019; Ecoworld, 2019; BOVAEAPM, 2020).

Bulk and Resale the Property

The increase of the investors to purchase in bulk and resale the property at a higher price have causes the Government to implement the Real Property Gains Tax (RPGT) to curb the speculation. The government have introduced different types of policy to encourage more purchaser to purchase the houses in Malaysia. In Year 2019, the Ministry of Housing and Local Government (MHLG) have implemented the Home Ownership Campaign (HOC) and the Rent to Own scheme because the house purchasers do not need to rent from the individual landlord (JPN & KPKT, 2018). The bulk purchase by a private organization or a housing club will cause the resale value of the property is higher and making the home ownership unrealistic (Rahah I., Yasmin M. and et. al, 2020; Suraya I. and et. al., 2021).

Uncertainty in House Purchase of RTO Scheme

The risk associated in the Rent to Own (RTO) scheme is the element of uncertainty because of the quick availability of the property when the lessee decides not to exercise the sale option (Francesco, et. al., 2019). Then the properties are risk to have oversupply and readily vacant into the market after the leasing termination. This could affect the stock housing market because of the immediate availability of the houses in the Market, and the developers are required to do marketing of the property again and sell to the new house purchasers. Meanwhile, the financial institution will need to process the cancelation of the leasing and purchase agreement when the house buyer decide to withdraw from the purchase. The risk assessments are important to the Rent to Own scheme because this type of risks associated in the RTO scheme will affects the systematic operation system in the tenancy administration and the financing schemes of the home purchase. Therefore, this is crucial to assess and reassess the customer financial background before deciding to obtain the RTO scheme for the house buyers because of the risk involved in the RTO schemes.

RESEARCH METHODOLOGY
DESK STUDY
The research is carried out through desk study in the project for Rent to Own (RTO) Scheme under several established developers in the state of Selangor. The purpose of desk study is to gathering the information of the property development in the Private Housing Scheme that introduced the Rent to Own (RTO) Scheme through the selected project at the States of Selangor. The desk study is through data collection in the developer's and RTO schemes website by the financial institution. Identifying the risk associated to the implementation of the Rent to Own (RTO) scheme and followed by suggestion to mitigate the risks.

PRELIMINARY CASE STUDY
A preliminary case study with the developer is conducted onsite and interview with the sales executive from the developer office that has participated in the RTO Scheme. Brief information was obtained from the case study and the information collected were described in the result and discussions. The potential challenges and issues in the Rent to Own (RTO) Scheme were enlisted and manages the information by collecting the raw data, brochures and the example calculation of the RTO scheme in the residential housing project.

RESULT AND DISCUSSIONS
RESULTS AND DISCUSSION OF PRELIMINARY CASE STUDY
A preliminary Case Study has also been taken out to do research from a Developer's Office located at the Semenyih town Centre Area and located about 2 kilometres from the Nottingham University, 43500 Semenyih. According to the research and the preliminary Case Study, surfaces of information of the Housing Projects and RTO Scheme projects have been reviewed by the housing developer. The brief description of the housing project is reviewed as accordance to the Literature Review.

The description of the housing projects for the RTO Scheme are explain as below. The property development is expected to be completed in Year 2025 and the targeted date of launching are June 2022.

The first five (5) years of RTO Schemes after handover is to make instalment RM1,000 to RM1,100 per month. Thereafter, after 5th year the instalment is multiply 2 times equivalent to RM2,000 to RM2,200 for a house with estimated Market Value of RM450,000. The estimated maintenance charge is RM0.17 per square foot or RM250 per month. The facilities are park and fully gated and guarded with a total of 32 Co-homes upper and lower floor comprises of 16 strata terrace 2-storeys. The occupancy rate as at dated May 2022 are 50% and the Built-Up Area is approximately 1,000 sq. ft. per unit.

Through the preliminary case study, the advantages and the risks associated with the RTO Scheme can be justified and determined in the next section.

CASE STUDY DISCUSSION OF THE RTO SCHEME

The purpose to do the groundwork in case study is to getting in touch and understand the local private developer's operation method and approaches to marketing these types of property development under RTO Scheme. The finding of the case study and the interview with the developers are very useful to the research because the information that were delivered by them are informative and supportive to the research. There are also required effort to meet with the House Bankers to getting involved in the RTO Schemes. Minor changes have been made to the style of agreement that all RTO Scheme purchaser's their lease agreement will be automatic change to sales and purchase option after 5th year of house ownership in the RTO Scheme.

At the preliminary stage, findings shows that the Property prices for Rent to Own Scheme are less than RM500,000 and the properties are located within the strategic areas with amenities like bank and facilities with University Nottingham located within the closed vicinity. The Police station of Semenyih and the public amenities likes open parks, football field, 2-storey shoplots and property management office are made available within the vicinity. The TNB Supply and water supply, sewerage service and telephone line services are all connected to the garden of the projects. For this purpose, analysis of the case study has shown that younger generation among group of 25 to 45 years old are interested in these types of RTO Schemes, they aim to have lower initial cost for the purchase of houses and they wish to own the houses located nearest to the working distance from the offices and easily commuting by train. They wish to have more RTO Schemes housing developer to participate in the RTO Schemes to provide more variety choices in the housing decision making process.

Types of RTO Schemes - Flexkey and Housekey

Getting to understand how does the operation of the Flexkey and Housekey to the consumer and how does the project sell to the consumer in Business to Business (B2B). Identify the leasing process and contract involved in marketing the RTO Scheme. Comparison of the RTO schemes in the different housing projects and identifying the risks factors.

Table 5: Samples of RTO Schemes in Malaysia

No.	Project's Name	Tenure	Year of Completion	Types/ BUA (Sq. ft.)	Sales Price	Rental (RM)
1	Terraced house and Town House @ Eco Forest, BirchPark 2	FH	2025	2E-Artisan Homes/ 1,798 – 1,985 sq. ft.	RM765,000 - RM1,118,700	From RM1,020 per month
				2F - Artisan Homes/ 2,005 - 2,239 sq. ft.	RM861,000 - RM1,236,220	
				2G – Alfresco Home/ 1,826 – 2,207 sq.ft.	RM 831,000.00 - RM1.209 Mil	
				2J - Co Home/ 1,019 sq. ft	RM 462,000.00 - RM505,000.00	
				2K - Co Home/ 1,012 sq. ft	RM 484,000.00 - RM501,000.00	
2	Double storey Terrace & Cluster house @ Eco Forest, Hazelton	FH	2023	Phase 1 - Type 3A /3B 2,185 - 2,303 sq. ft	RM 828,000.00 - RM1,097,250.00	From RM1,900 per month
				Phase 1 -Type 3D/ 2,479 sq. ft	RM 980,000.00 - RM1,123,000.00	
				Phase 1 -Type 3E/ 1,348 - 1,511 sq. ft	RM 570,000.00 - RM726,600.00	
				Phase 2& 4/ 1,871 - 2,375 sq. ft	RM 702,000.00 - RM1,119,300.00	
				Phase 3 & 5 -Type 3A /3B 2,185 - 2,303 sq. ft	RM 828,000.00 - RM1,097,250.00	
				Phase 3 & 5 -Type 3C/ 2,375 sq. ft	RM 922,000.00 - RM1,119,300.00	
				Phase 3 & 5 -Type 3H/ 1,380 - 1,414 sq. ft	RM 623,000.00 - RM700,000.00	

Notes for table 5: BUA: Built-up Area; FH: Freehold   *Source: Lum, 2017*

THE ADVANTAGES IN RENT TO OWN (RTO) SCHEME
Fixed Purchase Price for the Housing Loan
The advantages of RTO Schemes are majority of the house buyers will be benefited in home purchasing because there got more time and more choices to make in the Rent to Own Scheme. They can consider to rent first and purchase later (Ecoworld, 2019). The house buyers do not need to worry about their finances because they just need to concentrate in paying the house rental at the first stage of RTO Scheme and house purchase costs like down payment and legal fees were not required to make during signing the lease and purchase agreement (Lum, 2017).

Timely completion, reduced overhang situation and abandoned of housing projects
Moreover, the developers can make sure their projects were not in overhang situation because they may afford to earn rental income from the tenant during the RTO period (Rahah I., Yasmin M. and et. al, 2020). The duration is between

twelve (12) months to five (5) years, the customer will tight down with the lease and purchase agreements with the housing developers, they will secure a permanent sale through the RTO Scheme (Lum, 2017). Moreover, the developers will have Return of Investment because of getting participate in the RTO scheme. The homebuyers will need to ensure that the developer will not have delay in completion and to have regular follow-up with the developer to ensure the houses is completing according to the schedule (Fatimah, Z., 2020).

Joyful house purchasers and realistic in homeownership campaign
This RTO Scheme could encourage the Malaysian Nations especially working in the urban area can own an Ideal house during their younger age, the reason is this RTO Scheme are recommended to the working adults between 35 years old to 45 years old. The RTO Scheme have higher ranges of property prices between RM500,000 to RM1,000,000 for private housing development, and property that are selling below RM500,000 per unit for most of the public and private housing developments (JPN & KPKT, 2018; EPU, 2021; Gregory and Lim, 2022). There is positive feedback that the RTO scheme could encourage more middle-income group and higher-income group to buy the houses in the Klang Valley, Putrajaya and the state of Johor Bahru and Pulau Penang (Fatin J. , Tengku and et. al, 2019).

Secured through Permanent Lease and Sale Agreement
The RTO Scheme will permanently provide a shelter to the majority of the house buyers because this could reduce the burden for the house buyers, to move out after the tenancy agreement has been expired unless being terminated by the Landlord (Lum, 2017; Ecoworld, 2019). This RTO Scheme is a secured housing loan scheme from the Financial Institution because the RTO Scheme are a stable type of financing scheme to the house buyers and the developers (Francesco, et. al., 2019). The developers will have a proper tenancy administration and property management of their asset and properties for maintaining quality of the house projects. Therefore, the house buyers will be stable in terms of emotion because of getting a permanent contract and source of income besides living in a permanent address. This could help the purchasers to be more confident in purchasing the houses (JPN & KPKT, 2018; Gregory and Lim, 2022).

Systematic of Financial Planning and Financial Management
The Rental of the houses determine by the developers and the RTO Scheme are affordable (JPN & KPKT, 2018). This could slower down the process of mortgaging because the rental paid by the house buyers will lead them to secure their houses with the rental accumulated as the down payment and the house deposit (Gregory and Lim, 2022). Therefore, the RTO Scheme will become a platform for the house buyers to channel their income resources to different types

of monthly commitment in paying their debts like education, housing, vehicles or hire purchase, utility bills, medical and food bills (Lum, 2017; Ecoworld, 2019).

THE RISKS ASSOCIATED IN THE RTO SCHEME

Risk of Losing the First Purchaser to Rent and Buy - Termination of the Leasing and Sale Agreement

The first problem in the RTO Scheme is risk in the house buyers when they decide to terminate the Lease and Sale Agreement because of a specific reason like financial breakdown and retrenchment (Francesco, et. al., 2019). Research shows that a person can only afford to buy the house when they have at least 10% of saving in the bank account to pay their first 10% deposit according to the Third Schedule in the Housing Development Act (Control and Licensing) 1966 (Act 118) (Lum, 2017; Ecoworld, 2019; MBB, 2022). The house purchasers could not afford to buy a house above their affordability level, and the purchasers have to depend to receive loan approval over the debt service ratio with their gross income not exceeding than 90 percentage.

Risks of Bankruptcy of the House purchasers and the Guarantors because of non-performing loans and repayment of house rental

Furthermore, the house buyers may risk themselves to purchase the property and regret in their decision making because they do not do the correct calculation like estimating the budgets to pay back the loan and managing their finances (Tuti, H. and Ezdihar, H., 2021). Therefore, the guarantors will play a major part in this repayment back of the housing rental or loans because there were tight down with the Guarantee's Agreement. In case the house purchasers cannot afford to pay back the rental and the housing loans the guarantor(s) has to be responsible to pay back the debt. They might need to suffers in long term to served back the bad debt and release themselves from risk of bankruptcy (Lum, 2017).

Different between the purchase price for purchasing under RTO Scheme and the current Market Value

The properties purchased under RTO Scheme will have to lock at a fixed purchase price before the completion of the contract estimated a year to five (5) years later, depending of the progression of the house purchasers to transfer the rent to purchase. Certainly, the properties prices will reduce after completion for the first five (5) years because of oversupply of the houses and subsequent sales and purchase of secondary market of the property by other house purchasers in the property market (Rahah I., Yasmin M. and et. al, 2020). The developer's will have a fixed margin of profit and return for their housing projects because of scarcity in land, increase of labour cost, raw material costs like building materials and increase of traveling costs and etc.

Risk of Property Investment and Property Maintenance and Services
The housing developers have to improves the property facilities and management services for the housing projects to increase the confident level for the house purchaser to purchase under RTO Scheme (Tuti, H. and Ezdihar, H., 2021; Yasmin Mohd. and et. al, 2021). The developers have to improve their properties conditions by investing in the property management services in order to maintain the motivation of the house purchasers to purchase under the RTO Scheme.

The developers have to take the initiatives to advertise and to do project marketing for their residential properties in order for them to attract more house buyers to buy under the RTO Scheme. The developers have to maintain the facilities of the housing projects like the swimming pool and wading pool in the condominium, lift services, security management system, traffic flows, parking spaces, landscaping, property management to the residents. The quality of the housing projects will give an impression to the house purchasers to make their decision to buy immediately after occupying the properties under the RTO within the five (5) years of the tenancy period.

Rent to Own (RTO) Scheme are still in infant stage and time needed to the Stakeholders to getting involve in the RTO Scheme
RTO Scheme is a financial scheme that offers to the house purchaser because they need to borrow money from the Financial Institution in order to purchase the property (Gregory and Lim, 2022). The financial scheme is a new type of Scheme that have been introduced by the National Housing Policy (NHP) 2018-2022 together with the cooperation with the Banks (JPN & KPKT, 2018; EPU, 2021).

This RTO Scheme are still new in the industry, the changes in purchasing patterns from rent to own is a new term among the house owners and house purchasers. The house purchasers have to received more knowledge and information to accommodate to the newly implemented financial packages that offers to the house purchasers to buy, and the Developers to advertise and marketing for their housing projects. More training and activities like talks, seminars and presentation have to be carry out in order to promoting this RTO Scheme to the middle-income group to encourage the potential new house purchasers to buy.

Transparent of information under RTO Scheme
The information provided in the RTO Scheme must be transparent and this cannot be treated as only a Private Rented Sectors (PRS) because RTO Scheme involved the Stakeholders like the developers, financial institutions, valuers, lawyers, house purchasers and the guarantors (Ecoworld, 2019; Lum, 2017; Gregory and Lim, 2022). For example, when the tenant's decided to rent, the house purchasers must agree to pay for the rental deposit and the utility charges, while there are

additional costs incurred like outgoings for quit rent, repairs cost, maintenance charges, assessments, fire insurance.

Proper Communication required to inform the new house purchasers to be ready to pay for the outgoings before the period of leasing and when the time of the purchasers have purchased the properties, full rental amount inclusive of the outgoings were required to pay by the house purchasers.

Risk of Forfeiture of House Rental as Deposits and Getting fine in the Late Penalty Charges

Rent to Own (RTO) Scheme rental deposits can be forfeited when the tenancy agreements and the sales agreements are terminated due to delay in paying rental and recovery of the rental (Lum, 2017). The house buyers are responsible to settle the house rental and housing loan during the RTO Scheme to avoid forfeiture of the rental and getting fine in the late penalty charges.

CONCLUSION AND SUGGESTIONS FOR FUTURE RESEARCH

In conclusion, this paper aims to identify the risk associated to the Rent to Own (RTO) Scheme. The purpose is to ensure that the RTO Scheme can be smoothly deliver to the housing borrowers. The risks associated in the Rent to Own Scheme are due to many factors like newly implemented to the finance institution (Francesco, et. al., 2019). The financial Schemes are relatively new to the house buyers because they can rent first and purchase later. The house purchasers do not need to worry whether their financial status at the later stage still can affordable to pay, the house purchasers are paying the amount that are different of ten percent from the original housing loan instalments amount to replace with the rental payment (Gregory and Lim, 2022). The risks factors associates to the RTO Scheme model are highlighted in this journal papers including the house purchasers were required to seek for a guarantor for their loan agreements (Lum, 2017), and the developers will have the risk to have immediate vacant units when the customer decided to withdraw from the RTO Scheme (Francesco, et. al., 2019). This could become a phenomenon that many people think this are the risks that can mitigate by all of the stakeholders involved in the RTO Scheme.

The problem will be continuous to arise, therefore the preventive measurements are important to overcome all the uncertainty in RTO Scheme. The property sectors supply and demand are crucial in balancing the property market conditions (Rahah I., Yasmin M. and et. al, 2020; Suraya I. and et. al., 2021). This leads to the researcher to understand that further research is required to carry out to identify the potential risks that can cause the impact of the house purchasers' motivation, to make decision to buy the property under RTO Scheme. Besides, study need to be undertaken to do the research in each stage of the RTO Scheme because every stage of RTO Scheme is important to contribute to the successful implementation of RTO Scheme in Malaysia (Chee, 2019; Ecoworld, 2019).

The RTO scheme are unique to all the house purchasers in Malaysia because these financial schemes are newly introduced among the house purchasers, housing developers and the financial institutions. Different channel of advertisement of this type of RTO scheme have been offered by the housing development through the billboards, signages, websites, the brochures and pamphlets (Tuti, H. and Ezdihar, H., 2021). Therefore, the MHLG, Stakeholders in RTO Scheme will have more room to improves for the RTO Scheme in the future housing projects within the Klang Valley, the Southern Region and the Northern Region.

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GOVERNANCE OF STRATA BUILDINGS FOR URBAN CONSOLIDATION IN MALAYSIA

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Abstract

The need for urban consolidation is very necessary in helping the cities to be more dynamic in term of transformation, transparency and technology. Although the role of strata buildings in Malaysia is increasing, nevertheless this issue has been less explored. The continuous growth of strata buildings indicates the need for effective property management system that promotes and nurtures value that would create high quality of living. Currently, none of Malaysia's city is listed in the City Momentum Index; which one of the criteria is strong governance and planning. Therefore, the need for strata building for urban consolidation is vital for governance and management in practice. The underpinning of this study is to assess the current law and practice at federal level and evaluate with the industrial practice. A key component of this research is to formulate the best practice of governance in term of policy for strata buildings in Malaysia. The issues that circling the governance matters will be identified and further researched. Moreover, the effectiveness of Strata Title Act 1985 (Act 318) and Strata Management Act 2013 (Act 757) are also needed to be evaluated in the current practice of strata buildings in Malaysia. Furthermore, the role of Commissioner of Buildings, Joint Management Body and developer as administrator who bears the responsibility to carry out the provisions of the Act also need to reconcile to ensure good governance of strata buildings in Malaysia.

Keywords: Governance, Strata Buildings, Property Management, Urban Consolidation

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INTRODUCTION

> "Urbanisation and the need for urban consolidation is a
> global issue that raises significant economic, political,
> environmental and social challenges"

> (Randolph and Easthope, 2007)

Diverse set of planning regulations and policies intended to make better use of existing urban structure has been generally progressing well in Malaysia. Urbanisation in Malaysia has fuelled the growth of rapid development of strata buildings. Over the years, the strata development schemes recorded a steady increase. According to the Commissioner of Building Division (COB) under the Ministry of Housing and Local Government, there are total of 1,589,1837 strata units in Peninsular Malaysia as at December 2020. With the increase in number of strata buildings in Malaysia, it is important to ensure proper governance of all those buildings. The question of how best to govern strata properties in an increasing rapid economy has received a significant amount of attention over the last few decades. Given the fact that the governance of strata buildings have an impact on a quarter of the population in Malaysia, it is valuable to provide an overview of some of the issues that have arisen in the governance of strata developments. As the majority of the strata buildings in Malaysia are located in major cities, it will consequently create a well-being lifestyle among urban communities in Malaysia. This understanding subsequently develops the importance of governance in strata management issues.

RESEARCH BACKGROUND

Governance can be defined as a process of decision making and the process by which decisions are implemented or not implemented (JLL, 2004). Jessop (1998) indicated that the concept of governance implies a broader understanding that coordinating the activities affecting a system may involve many other actors and processes. It is further elaborated that governance plays a crucial part affecting business and investments in real estate which will, presently and continuously in the future, be the utmost important driving force of city competitiveness (Juanil and Razali, 2008). Good governance in strata aims to protect the property right of individuals and the building state by promoting accountability, efficiency and transparency in strata developments. Similarly, Hambleton and Gross (2007) argued that focus on governing is desirable as it can blend together an interest in using the legitimate hierarchical power of the state with an inclusive approach to partnership building of governance which may lead to a sharper focus on the desired outcomes. In recent times, the potential impact on governance patterns is also a noteworthy feature of growth of strata buildings. In Malaysia, although

governance that relates to real estate has already been defined, nevertheless, it has not been identified systematically. The literature background within this subject matter is quite limited which proves that investigation needs to be done.

Strata buildings comprises a building which is subdivided into parcels which includes accessory parcel. Strata ownership has been introduced into legal systems all over the world for basically similar reason, namely to cater the social, economic and psychological needs of society (Hussein, 2006). Stratified property development maximizes density within the allowable planning standards (Khalid et. al., 2017; Azmin N., 2006). Construction of strata buildings in the urban cities such as Kuala Lumpur, Pulau Pinang and Johor Bahru is a phenomenon due to scarcity of land and high land costs (Zan et al., 2018). Given the increasing number of stratified buildings in urban development, the concept of urban consolidation will enable us to get a better understanding of strata developments as an effective way of dealing with increasing urban populations and the problems of urban sprawl (Randolph and Easthope, 2007).

Rapid population growth with economic development fuels the urbanisation process. Urbanisation is a reflection of human activities affecting the land that has been threatened by enormous pressure from population growth (Hamad, 2020). Researchers have reflected urbanisation as a significance growth of people living in urban areas induced by social and economic factors (Vlahov and Galea, 2002; Antrop, 2004; Duflot, 2012). Accelerated urban growth is generally connected with and driven by the concentration of the population in an area (Jat, Garg and Khare, 2008). By observing the development trend, urban consolidation is regarded as one of the strategies for optimization of land use in urban areas. It increases the availability of services and facilities to ensure high quality of life by preserving the urban space. Burgess (2000) terms it as the process to increase built area and residential population densities to intensify urban economic, social and cultural activities. Researchers have highlighted that urban consolidation has been main planning policy since the 1980s and had emerged as the corner stones of prevailing urban planning (Kubler and Randolph, 2007; Searle, G., 2007). Thus, for urban consolidation to be successful, it is necessary to ensure that the governance of strata buildings to be feasible, comprehensive and prudent.

RESEARCH GAP
Research about governance and urban consolidation are various, however, less research has been explored on the implications of governance and urban consolidation towards strata buildings in Malaysia and how different the urban process will influence the capacity and effectiveness of Commissioner of Building (COB), Joint Management Body (JMB) and developers as agencies of property governance and management in contemporary urban Malaysia. A study conducted by Easthope et al., (2012) provide important sights regarding the

widespread concern among strata owners on the quality of the management and governance in their schemes. It is further highlighted that a growing range of issues has emerged in recent years concerning the developments and operation of strata schemes in Malaysia (Tawil et al., 2012; Azian et al., 2020). According to Easthope, et al. (2014), one might anticipate that the strata building would operate smoothly because it has been embraced as a key enable of a country's urban consolidation, but recent evidence has demonstrated the plight of owners about the quality of management and governance in their schemes. Thus, study on the governance of strata buildings for urban consolidation in Malaysia should be conducted because the real issues are not known yet. Therefore, this study bridges the gap and discovers the real issues by probing the property practitioners, government bodies and owners of strata schemes in Malaysia.

GOVERNANCE IN STRATA BUILDINGS
Most strata scheme owners may be unaware of their rights in terms of strata scheme governance (Goodman and Douglas, 2008). Despite the growing importance of strata titles in our lives, little is known about how well the strata system actually functions to suit the preferences of persons who own and live in strata properties. The above statement is further supported by Easthope et al. (2012) who agreed that owners may not be aware of their rights with regard to the governance of strata schemes. From legal perspective, stratified properties are governed by several Acts such as Strata Titles Act 1985, Strata Management Act 2013 and Housing Developers (Control and Licensing) Act 1966 and its Regulations (Khalid et. al., 2017). Easthope et al. (2012) point seems to be that the interest in the governance and management of strata schemes has grown as a result of a variety of factors, which have been described in detail in Table 1.

Table 1: Factors influencing governance and management of strata schemes

Factors	Description
Consumer	The efficient and equitable management of strata schemes is a topic that affects the lives of everyone who lives in or invest in strata properties. These are people's homes as well as their primary financial investment in many cases
Political	The developed environment includes a large number of strata properties. As a result, in some jurisdictions, the concerns of these strata residents and owners are becoming more vociferous, leading to increased government attention to the challenges they face
Planning	The successful implementation of urban consolidation strategies in major cities that rely heavily on the expending distribution of strata properties is also dependent on the effective and equitable management of strata schemes

Factors	Description
Business	Some property management organisations, have begun to focus their businesses on delivering efficient management techniques that suit specific property and consumer types, owing to the rising strata sector's prospects for specialisation and professionalisation of services
Investment	It is believed that with investors owning as many of strata properties, the sector represents a key asset class in which both investor and those who fund these investments have an increasingly vital stake

Source: Easthope et al., 2012

The directions above that have been clearly justified by Easthope et al. (2012) is in line with Leshinsky and Mouat (2012) who elaborated that strong governance practices are critical for assigning and managing community space, which is heavily reliant on an effective management bodies and relationships between and among various stakeholders. Regardless of the views that has been put forward by many scholars, the key issues lie in the mechanism through which the property practitioners participate in decision-making, how property companies and developers are accountable to its owner or buyer and the way the governing bodies obligate its members to follow its norms and regulations

On the whole, there is a need for a systematic understanding of what transpires in day-to-day management of strata schemes. It would then justify the principles of good governance in terms of policies, infrastructure and actions that assist the implementations of governance initiatives.

GOVERNANCE ISSUES IN STRATA BUILDINGS

As a result of demand and supply from the home buyers, strata buildings are occupied by a large number of people. The role and function of regulators and the need for improved disclosure and good governance are among the issues that generate analysis and debate by the public (Buniamin et al., 2008). In the context of governance issues in strata buildings, it can be divided into four categories, which are; the state of the building, financial planning, people management and enforcement approach.

A. The State of the Building

Adoption of high-quality building materials, provision of access to portions of the strata building that require regular maintenance and high quality workmanship that can decrease future management workload must all be taken into account during the design and construction stages. However, the consideration is only taken after the construction is completed. Hence, it could lead to many fatalities (Pheng and Wee, 2001). Christudason (2004) and Easthope

et al. (2012) have highlighted that building defects constitute a major concern in strata schemes. Beyond defect and design issues, the daily maintenance of strata schemes is also an important consideration. The maintenance works carried out in an individual unit is solely the responsibility of the proprietor himself, whereas the maintenance of common properties is a shared responsibility (Choon et al., 2016). As a result, the Strata Titles Act established MC to help with the effective governance and management of common property for the benefit of all proprietors. According to Horner et al. (1997), good emphasis should reflect the important aspects of the management of facilities to ensure continuity in the management of user needs with the goal of building an organization.

B. Financial Planning

Based on data from the Housing and Strata Management Tribunal (TPPS), the number of complaints forwarded to the Strata Management Tribunal increased from 2,642 in 2016 to 4,964 in 2018. The data shows that the majority of cases brought before the hearings were connected to the collection of service charges, which is not surprising. Likewise, examining dispute management, Mohamad and Sufian (2013) highlighted that the reluctance of parcel owners to pay the service charges and other contributions to the developer are among the major complaints of strata properties. In addition, parcel owners whom have no control in the amount of service charges and the quality of services provided also contributes as one of the most common complaints about strata properties (Kamaruzzaman et al., 2010; Tawil and Goh, 2011; Abd-Wahab et al., 2015).

On the other hand, Izanda et al. (2020) undermines the position that due to lack of standard rules and regulations for determining the charges for strata scheme properties (Tawil and Goh, 2011), lead to developers took advantage of the situation and delayed the registration of strata tittles in order to impose any regulations and additional fees on the building management system, causing parcel owners to be dissatisfied (Abd-Wahab et al., 2015). Another issue of concern highlighted by Easthope et al. (2012) would be the constant engagement of the developer in strata scheme can cause negative impact on the management of finances because they tend to set low initial level for service charges, resist spending on the building and misuse of funds. The failure of setting aside sinking fund during emergency situation will deter the need for the building to be maintained to retain the value. In the case of sinking fund is underfunded, the resultant impact on depleted amenities in strata schemes will undoubtedly result in poor maintenance, deterioration of common property, potential loss of real estate value and a lower rate of return for the property investor (Antoniades, 2010). Hence, long term planning and forecasting would reduce the expense of building upkeep and maintenance for future generation owners of strata schemes.

result of urbanisation pressures, rising real estate values and the effects of urban sprawl, a growing number of people began to live in strata buildings around the world (Easthope et a1., 2014). Moreover, the adoption of strata title legislation permitted a major increase in private sector interest in establishing strata schemes comprises of apartment and condominiums (Easthope et al., 2012). However, little attention has been given on how the increase in strata buildings impacts the urban consolidation process.

Malaysia is one of the most urbanised countries in East Asia, as well as one of the world's most quickly urbanising regions (O'Neil, 2021). The urban population of Malaysia increased from 34.3% in 1971 to 77.2% in 2020 growing at an average annual rate of 1.67% (World Data Atlas, 2021), as shown in Table 2 below. Based on the revelations below, the growth of urban population has been sustained since 2009.

Table 2: Population of Malaysia: 2009 – 2020

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Value (%)	70.1	70.9	71.6	72.3	72.9	73.6	74.2	74.8	75.4	76.0	76.6	77.2

Source: World Data Atlas, 2021
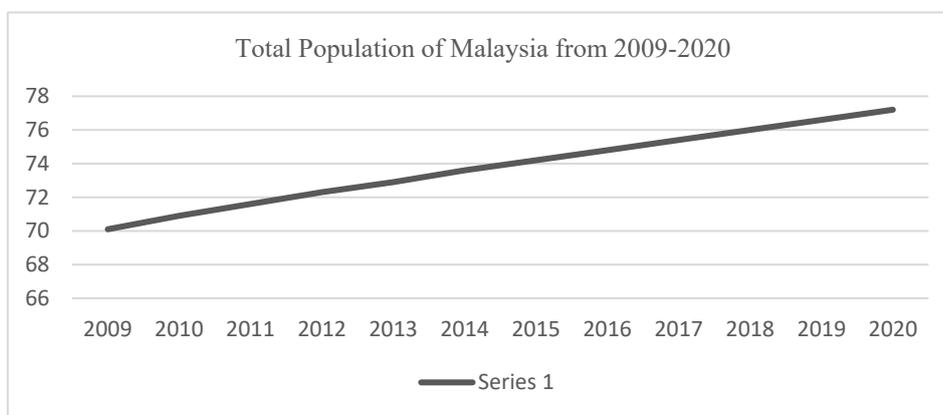
Figure 1: Total Population of Malaysia from 2009 - 2020
Source: World Data Atlas, 2021

Natural growth, rural-urban migration and reclassification of rural regions and agglomeration of built-up regions are the three components of urban expansion that are important in determining the level of urbanisation in Malaysia, as investigated by Duflot (2012). It is posited that the country's economy developed as a result of urbanisation. However, Easthope et al. (2012) and Chu et al. (2013) argued that even if the primary benefits of urbanisation are to raise people's living

standards, it can also have negative consequences on strata schemes. In response to continued housing shortages and worries about the alleged detrimental environmental, health and social implications of urban expansion, the Australian government supported urban consolidation (OECD, 2012). The main cities in Australia such as Sydney, Melbourne, Perth, Brisbane and Adelaide support urban consolidation to combat urban sprawl in the face of rising population and demographic change (Easthope et al., 2014). While urbanisation is a necessary step towards modernisation and progress for developing countries, it is a complex process that requires constant attention and monitoring by the government. In essence, urban consolidation should remain as the primary planning goal of Malaysian urban planning.

CONCLUSION
This research continues the theoretical theme with a critical review of strata schemes which focuses on governance in order to accomplish the objectives of this dissertation. This is despite rising evidence of inadequate and poor management processes which have major ramifications for occupants' safety and well-being, as well as their financial investment. It is clear that this is worldwide phenomenon (Yip et al., 2007; Blandy et al., 2010; Chu et al., 2013).

Malaysia road map towards implementing urban consolidation efforts is still long way ahead. Ultimately, successful implementation of urban consolidation process shall depend on the effective cooperation and collaboration of all parties that are directly or indirectly involved in this strategy. In essence, it is foremost important to address development in a coordinated manner to promote good governance initiatives in strata living for urban consolidation.

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THE IMPLEMENTATION OF VIRTUAL REALITY (VR) TECHNOLOGY IN REAL ESTATE INDUSTRY

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Abstract

COVID-19 pandemic impact has accelerated the real estate industry to adopt technology evolution quickly. Due to the normalisation changes from the pandemic, all the physical real estate selling processes, including housing tours, sales, and purchase agreements, could not be effectively done as before. In this situation, Virtual Reality (VR) has become a prominent approach for real estate agents to improve their marketing strategies. This prospective study was designed to investigate the potential activities needed in VR implementation and to explore the importance of VR in influencing real estate marketing. Primary data was gathered from 60 real estate respondents using purposive sampling and descriptively analysed using SPSS software. The findings indicate that VR tours of the property, 360-degree visualisations, and visualisations of room furniture are the most potential activities needed in VR implementation. While VR is important because it indicates detailed information about the property, provides high-quality photos, and is a good investment opportunity. Overall, this study provides insights into how VR technology can help realtors survive in the evolving real estate industry.

Keywords: Virtual Reality (VR), Real estate marketing, Estate Agents

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INTRODUCTION

COVID-19 pandemic is a phenomenon that has been spreading all over the world and Malaysia being the one of the countries that is included to be affected by this virus causes a crisis which have led to pain and death (Shanmugam et al., 2020). Sonja A. Rasmussen, MD, MS (2020) said that the real estate industry is facing great uncertainty due to COVID-19 especially, in the housing selling process since house views are the critical part. However, everything was interrupted due to social distancing precautions where they must reschedule their meeting, and sellers must convince themselves that the healthiness of potential buyers visits to view properties is good. Real estate players must take immediate action in this transformative change to improve in business performance including considering the risk that will happen in the future (Equity & Practice, 2020).

Virtual and Augmented Reality (VAR) are technologies that have been familiar especially in the past couple of years. These technologies have become more approachable to the public now (Pope, 2018). According to the American Heritage Dictionary, a common definition of virtual is existing or resulting in the presence but not in real form, fact or name also can be created, simulated, or carried on by means of a computer or computer network while Fernandez (2017) state that it is the action to induce a targeted behaviour in an organism by using artificial sensory stimulation, while the organism has little or no awareness of the interference (Lavalle, 2020). Besides, the VR also has been used in gaming, entertainment, education, marketing, communication and now considerably used in other businesses (Barnes, 2017). Deaky & Parv (2018) reveals that real estate market has been chosen as one of many application areas of VR technology through assorted companies which develop applications, so Bluemind Software has developed an innovative idea named VR4RE (Virtual Reality for Real Estate). Many realtors and homeowners consider staging a home as a crucial part to increase potential buyers of the home where they must fill with furniture and decorations (Brenner, 2017).

If we look at it from real estate agency point of view, there are few challenges must face especially during this crisis; one of the challenges is pending of home-buying process which has interrupted their work to proceed housing tours and force them to rearrange appointment with their client to follow Movement Control Order (MCO) that stated by government in Malaysia (Sulaiman et al., 2020). Next difficulties in preparing home staging which most estate agents and homeowners see as a core part of the selling process. Home staging is the process of adding decor, rearranging furniture, and expertly dressing up the home to make it look stunning for listing photos and walkthroughs (Mahardi, 2020). As an estate agency company, they still must do this process to gain attention and impress buyers when visiting their property. Although staging does not give effect to the housing price according to Lane et al. (2011), most realtors and homebuyers wrongly believe that proper staging can

lead to a higher selling price.

As the property price gets higher, people realise that the traditional methods of property sales involve high costs, especially advertising and marketing (Felli et al., 2018). Marcus T. Al len, Anjel i ta Cadena, Jessica Rutherford (2015) found that there is significantly different price between houses sold by agents or homeowners. While marketing budgets are wasted just to decorate their property to feel bright, energetic, and homey, real estate agent companies can use virtual reality technology as a medium of staging which is an effective marketing tool and communication for the real estate industry. The VR machine can provide a multi-sensory condition, which enables users to encounter the vibe of sight, hearing, smell and even touch (Abrar, 2019).

In general, the nature of the real estate industry, especially in marketing, has changed due to the outbreak of COVID-19. Therefore, there is a need to explore the potential activities needed in VR implementation and acknowledge the importance of VR in influencing real estate marketing.

VIRTUAL REALITY IMPLEMENTATION

Virtual Reality (VR) is an information processing system use in a computer which could help people to create and experience virtual world, it can form a multidimensional information space in which people can immerse in, transcend and interact using uses 3-D glasses, sensing gloves and a series of auxiliary sensing equipment (Kun & Zong, 2009). According to Pope (2018), Virtual Reality means an experience that symbolises an alternative to reality where someone can feel most of the senses like actual reality and the concept of VR came from the idea of putting two photographs side by side with mirrors in an optic device to manipulate the brain into seeing three dimensions, called a stereoscope, developed by Charles Wheatstone in the 1830s.

A study done by Singh et al. (1996) has defined VR as a system to transport and immerse users into a virtual space. Usually, it can be achieved by using a headmounted display system but sometimes for non-immersive forms of VR, can bring users for immersing from virtual space within their real environment. VR has become more effective when scientific and simulation data can create the visualisation from multidimensional data and high volume to enable an interaction between users. Thus, it can empower them to analyse things that are limited to the human sensory system (Juan et al., 2018). Besides, Pantano et al. (2017) outlined that VR can certainly influence people's intention to buy products based on the way they gain the product details, consequently, it is very important for providers to ensure that the quality of virtual visualisations is great. Based on these relevant studies, it can be concluded that VR needs to be widely used in the real estate industry as one of quality marketing approaches since it can enhance potential property sales by using the application of VR based visualisations.

VIRTUAL REALITY IN REAL ESTATE INDUSTRY

Typically, in traditional marketing strategy, estate agents will be entering the property's details such as location, condition of the building and many more. However, technology's advance is increasing over the time until VR was developed (Marcus et.al, 2015). The idea to develop Virtual Reality for Real Estate (VR4RE) began in 2008, when discussions between real estate developers wanted to make a prototype of a 3DCar that could be used to present real estate. After having several attempts to complete a simple prototype, finally the first good looking prototype came out during a Startup Weekend event in Brasov, Romania, in 2013 (Deaky & Parv, 2018).

The applications of VR have been widely used in real estate because it can afford marketers the opportunity to give potential consumers the most realistic experience of a product, service, or place without necessarily being there. Wang et al. (2014) mentioned that having access using VR to under construction and walkthrough is the key-points to encourage clients to buy property and boost property sales. In 2017, the virtual tour was a very trendy marketing approach by VR to get brand experiences. This statement shows that virtual reality photography had a positive impact in supporting the real estate market where mental imagery or also known as the perceptual representation of nonverbal information in memory (Kim et al., 2020). Virtual Reality (VR) Technology might be the perfect solution as the viewer can control any position and angle to view around the house with a 360-photography digital tour (Sulaiman et al., 2020).

Figure 1: Matterport 3D Virtual Tour
Source: https://www.novoreperio.com (2022)

According to Shults et al. (2019), the communications between estate agents can be improved by implementing VR. The author reports that misleading

advertisements by agents can lead to vacancy rates as high as 80-90% within the first 10 months of occupancy. Park et al. (2014) stated that the construction industry is always concerned about construction defects, as a result, VR technology can overcome the fear by creating 360 videos during the construction process. According to Crowston & Wigand (1999), even though virtual tours cannot be perfect as on-site visits, it clearly can shorten the time spent for the housing tour and improve the search process such as neighbourhoods and accessibilities. As property becomes more expensive, people realise advertising and marketing will be the main costs (Lane et al., 2011).

While Hou & Wu (2020) emphasised that the use of VR will assist the potential buyer to make better purchase, usage, changes, and reconstruction decisions that are connected to their properties through an immersive environment. As highlighted by Poushneh (2018), VR can assist customers to capture their interest and increase the product's expectations. He also mentioned VR can be used to collect a variety of viewing elements to observe the property from any angle of a three-dimensional display. Yuen et al. (2011) argues that designers, workers and clients can use VR to allow them to walk through a real world site and imagine like they are in a building under construction in real time. This marketing method can let the users feel connected to the project and enable them to inspect multiple areas around the sites. Pantano & Servidio (2012) suggest that communication between their clients can improve by utilising visualisation techniques because clients will imagine their presence at the site or property and lead them to having some experience like in the real world, therefore they tend to buy the property.

In overall, VR applications over time have become an innovative method to reduce costs and benefit from higher volume Benefield et al. (2019). According to Boga et al. (2017) many real estate players including estate agents, property managers and developers can gain a benefit from the implementation of VR to boost their real estate services at the same time increasing competition between them. In conclusion, technology affordability that applies in VR technology can achieve its main purpose which is to increase property sales.

METHODOLOGY
This study will identify the extent of the implementation of VR technology in the real estate industry to facilitate the method of knowing real estate virtually by conducting a systematic literature review from previous studies and identifying the importance of VR in the real estate industry holistically. The researcher has explored the importance criteria through the literature review. The purpose of literature review is to find the main variables and establish familiarity on the VR technology in real estate. All variables that gained from literature review such as definition, uses, effect, application and case study has been determined in this stage.

Next, the sampling design has been selected. This study uses a non probability sampling technique. The type of non-probability sampling that is used in this research is purposive sampling, also known as judgmental, selective, or subjective sampling towards the experts in real estate industry. The questionnaire was distributed to sixty (60) respondents who are related and involved to the real estate industry. The data were analysed using the frequency and descriptive statistics approaches to identify the main importance variables that show the potential of the implementation of VR in the real estate industry in the era of Industrial Revolution (IR) 4.0.

FINDINGS AND DISCUSSION

This section addresses the analysis of the survey outcomes and summarises the findings based on the potential activities needed in VR implementation and the importance of VR in the real estate industry.

Potential Activities Needed for Virtual Reality (VR) Technology Implementation in Real Estate

Researchers have identified the application of VR in real estate activities and identified the dominant and important variables to emphasise the importance of VR in stimulating and facilitating business in the real estate industry effectively.
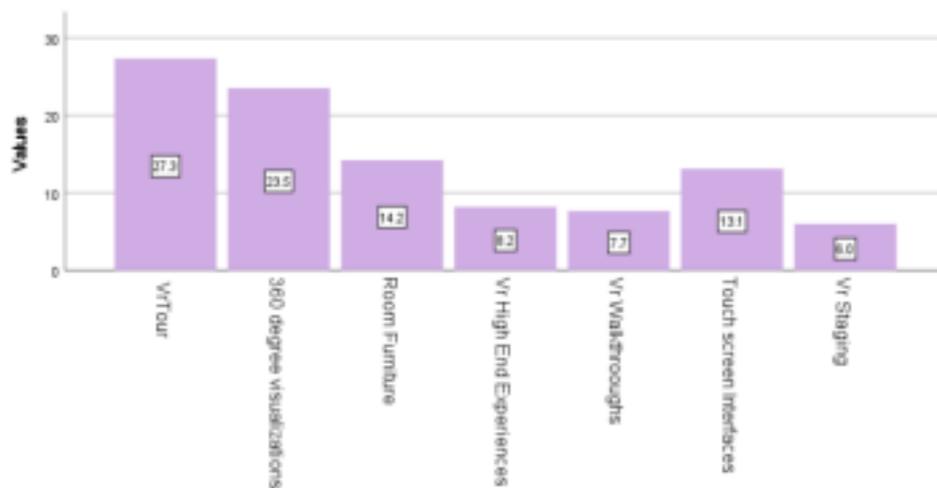
Figure 2: Virtual Reality of Real Estate Activities
Source: Questionnaire Survey (2022)

Based on Figure 2, 27.3% respondents are familiar with the VR tour of property, followed by 360-degree visualizations with 23.5% and visualizations of room furniture at 14.2%. The least selected activities are VR High-End

Experiences, VR walkthroughs and VR staging which have recorded at 8.2%, 7.7% and 6% respectively.

The importance of Virtual Reality (VR) Technology Implementation in Real Estate

The purpose of descriptive analysis is to summarise and organise characteristics of responses collection or observations from a sample or entire population (Bhandari, 2022). Besides that, this analysis is used for measures of central tendency which consists of mean and measures of variability that include standard deviation and variance. Standard deviation is the dispersion of data in a normal distribution Lee et al. (2015) meanwhile, variance is the average squared deviations from the mean.

Table 1: Descriptive Statistics Analysis

Variables	Mean	Standard Deviation
1) VR uses in consideration	4.73	.548
2) Investing towards virtual reality technology	4.67	.572
3) VR enable to boost property sales	4.58	.671
4) VR enables buyers to access without cost and time.	4.43	.789
5) High quality photos can attract buyers.	4.42	.766
6) Detailed information in property is important	4.28	.804
7) Visual experience can stimulate physical presence in places in the real world.	4.55	.746

Source: Questionnaire survey (2022)

Based on Table 1, the researcher has listed the result according to a descending score of mean. There are 7 variables that are tested in the descriptive statistics above to get its mean, standard deviation and variance scores. The variable that has the highest mean value is detailed information such as measurement, labelling the space and the item in every location in the property is important, it has recorded a mean value of 4.73 which indicates that precise data or figures of property is crucial. The standard deviation is 0.548 and the variance is 0.301 shows that the data is well spread and dispersed. According to the research done by Xiong & Cheung (2021), agents, buyers and sellers prefer complete details to access which can provide accurate, timely and easy to search

related to the housing information.

The result from Table 1 has clearly shown that detailed information of property ranks the first in value of mean. The second variable that recorded a high mean value is high quality photos can attract buyers, the mean value is at 4.67 which indicates that the respondents agreed, high quality photos showcasing the property can make buyers interested. The standard deviation is 0.572 and the variance is 0.328 which indicates that the data is well dispersed and spread.

Next, the respondents admitted that real estate companies should invest towards virtual reality technology with the score mean value of 4.58. The standard deviation is 0.671 and the variance is 0.451 which indicates that the data is well dispersed and spread. VR in the real estate industry has been widely used all over the country. Thus, the question asks the respondents if they agree that real estate companies especially in Malaysia should invest towards this technology and they respond positively to this question.

VR enables buyers to access without cost and with less time is recorded high mean value in this study is consideration of using VR as future marketing strategy, it has recorded a mean value of 4.55 which indicates that most of the respondents have agreed that they had considered using virtual reality as marketing strategy in the future. The standard deviation is 0.746 and the variance is 0.557 which indicates that the data is well dispersed and spread. According to Juwai (2020), using VR as a marketing strategy has benefits as it can make a way to stand out from the pack as a tech-forward agent or developer that is in touch with current trends. It is also allowed global reach as it is not limited to a local buyer only.

VR also can produce high quality photos at the same time will attract buyers to purchase the property without a doubt. This variable that has a high mean value in this study is uses of VR can save cost and time, it has recorded a mean value of 4.43 which indicates that most of the respondent has agreed that the VR enables the potential buyer to access the model space online without any further cost and time commitment. The standard deviation is 0.789 and the variance is 0.623 indicates that the data is well dispersed and spread. Juwai (2020) also describes that VR has cost-effectiveness because it can replace some of the traditional marketing initiatives while eliminating the costs of staging a physical property. Normally, a lot of cost has been used to make the staging of the house where furniture and amenities have been included to portray the attractiveness of a property.

The following variable is the booster of property sales, the mean value is at 4.42 which indicates that the respondents agreed that virtual reality can boost their property sales. The standard deviation is 0.766 and the variance is 0.586 which indicates that the data is well dispersed and spread. This mean value is quite low because not too many respondents chose "strongly agree" regarding

this question as they might not agree that VR can really increase their property sales.

The last variable in this study is stimulation of visual experience. It has recorded the mean value at 4.28 which pointed out that the respondents do not really agree that visual experience can simulate physical presence in places in the real world. The standard deviation is 0.804 and the variance is 0.647 which indicates that the data is well dispersed and spread. This variable has the lowest mean score because Tareen (2021) argues that VR still has some disadvantages like the virtual tour still cannot be the same as physical tour as there is still lags behind because of complications in grasping the complexity of the technology. Although a VR headset offers the most realistic experience, the technology has failed to gather interest plus some people may be insecure to share headset gear of VR due to contamination fears.

CONCLUSION
The COVID-19 pandemic has caused many people to lose their jobs. Not only are businesses affected, but the real estate industry also has the impact ~~too~~ because all the appointments will be pending such as the buying process, sale and purchase agreement and housing tours must be done face-to-face. These research findings will benefit real estate agents to solve the problem because the potential homebuyers can attend a virtual housing tour which consumes less cost and time. This study recommends that real estate industry stakeholders to fully utilise the VR technology as a new real estate marketing strategy. Since it has also proven to ease the process of housing tours, enhance potential buyers' experience, and act as an advanced marketing tool, thus, VR technology can help realtors survive in the evolving real estate industry.

ACKNOWLEDGEMENTS

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POTENTIAL OPPORTUNITIES OF BLOCKCHAIN TECHNOLOGY IN STREAMLINING THE MALAYSIAN COMMERCIAL OFFICE BUILDING OPERATION MANAGEMENT PROCESS

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ENGINEERING

Abstract

Managing commercial real estate is extremely complex and cumbersome and involves many stakeholders who provide access to and modify a variety of information. This led to some common issues with traditional commercial real estate management such as lack of transparency, third-party interference, the complexity of the agreements, record keeping and security, and absence of real-time data. Accordingly, blockchain technology is anticipated to address the issues of data openness, trustworthiness, and correctness in the global real estate market. This research aims to discover the potential opportunities that blockchain could offer in streamlining the commercial office building operation management process. A conceptual framework of blockchain-based technology adoption in the current Malaysian commercial office building operation management process was developed based on the literature review and focus group discussion (FGD). The framework was underpinned by four core operation management that emerge from the research findings including financial, administrative, technical, and promotional management.

Keywords: Blockchain technology, commercial office building, operation management process, digitalization

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INTRODUCTION

Commercial real estate management is an extremely complicated and cumbersome task and not as easy and straightforward as other types of real estate (Wouda & Opdenakker, 2019). It includes many stakeholders such as owners, tenants, operators, investors, lenders, real estate agents, contractors, and service providers who provide access to and change a wide variety of information. Accordingly, commercial properties require full and ongoing management by the owner ranging from finding, managing, and retaining tenants, overseeing leases and financing opportunities, to coordinating the maintenance and marketability of the property.

Besides that, there are some common problems and issues with traditional commercial real estate management such as lack of accessibility, lack of transparency, high capital barrier, third party intervention, lack of liquidity (Namrata, 2020), the complexity of agreements, management of cash flow, record keeping and security as well as the Lack of real-time data (Akash, 2019). Most properties are either managed offline through manual paperwork or through multiple software programs that generally do not work properly and do not integrate well with each other (Bansal, 2019). Day-to-day duties were physically completed, and all work set out in a meeting, support bills, and individual contact numbers were collated on the papers (Mokhsin et. Al, 2020). This traditional way of recording and documenting complicates the process of tracking and maintaining property records, contributing to the lack of real-time data, inefficient property search process, and a high risk of fraud.

To overcome these disadvantages and challenges, blockchain technology is one of the promising technologies that is believed to revolutionize the way the real estate industry operates worldwide, from smart contracts to managing and keeping records of the execution of real estate sales and rentals up to takeover by land (Franks, 2020; RICS, 2020; Bhatia & Wright de Hernandez, 2019; Hoxha & Sadiku, 2019; Grover et al., 2019; Karamitos, I., Papadaki, M, Al Barguthi, 2018). Accordingly, blockchain technology adoption is gradually gaining momentum in the real estate sector, with a particular focus on the commercial part of the industry (Namrata, 2020; Deloitte, 2016).

In response to the above issues, the following research questions are formulated to provide an overview of the various ways of blockchain technology integration into the commercial office building during the operations management process.

RQ1. What are the distinct phases of the current commercial office building operation management process in Malaysia?

RQ2. What are the challenges encountered by the property manager in managing commercial office buildings in Malaysia?

RQ3. What are the possible opportunities of blockchain technology in streamlining the commercial office building operation management process in Malaysia?

This paper aims to explore at which stages of the commercial office building management process could be benefited from the adoption of blockchain technology by analysing the current management process for office building operations and gaining insights into the implementation of blockchain technology.

RESEARCH BACKGROUND
Commercial Office Building Operation Management Process
Commercial real estate management includes the tasks and responsibilities of operating an investment property such as offices, retail space, warehouses, shopping centres and industrial buildings. It covers a range of two-fold functions: (i) to maintain the investments in the property, and (ii) to maintain the physical aspects of the property at a point of optimum efficiency and economy.

According to Ring (1967), in addition to the physical maintenance of the premises and handling tenant complaints, additional tasks would include marketing space, advertising and finding attractive tenants at the best possible prices. Purchases of consumables and equipment and expenses for repairs and proper accounting and preparation of regular reports. This is due to commercial leases, which are generally longer than other properties, with built-in extensions such as a five-year lease with renewal options and rent increases. The marketing and lease negotiation processes are also longer and more complex than with other types of property management.

RICS (2017) has shown that property managers should support the business in planning and executing fundamental property decisions such as the best use of space, appropriate technology solutions, staff and a safe environment. Property management activities highlighted by RICS (2017) include day-to-day management of properties on behalf of the owner, collecting rent and other receivables, managing utilities, paying expenses, maintaining including repairs and providing services such as insurance, supervising staff engaged in services, providing health and safety advice, and negotiating with tenants or prospective tenants. According to Malaysian Property Management Standards (MPMS) 2nd Edition, during the operation and management of the building, seven property management activities are involved, including maintenance management, financial management, administrative management, insurance management, health, safety and emergency management, rental/lease management and facilities management (BOVEAP, 2016).

Overview of Blockchain Technology in Malaysia

Under the National Fourth Industrial Revolution (4IR) Policy, blockchain technology has been identified among the five foundation technologies in Malaysia besides artificial intelligence, internet of things (IoTs), cloud computing and big data analytics, and also advanced materials and technologies. Additionally, the Ministry of Science, Technology, and Innovation (MOSTI) launched *Dasar Sains Teknologi dan Inovasi Negara (DSTIN)* 2021-2030 to introduce a 10-10 Malaysian Science, Technology, Innovation and Economy (MySTIE) Framework that highlighted on the 10 key Malaysian socio-economic drivers with 10 global leading science and technology drivers. Through this framework, blockchain technology has been seen as a technology that could shift Malaysia up the global innovation for business and financial socio-economic drivers including asset and retail management (Academy of Sciences Malaysia, 2020).

Individuals wishing to conduct a transaction on a blockchain network, such as transferring a unit of cryptocurrency or ownership of a property to another person relinquishes control of the asset by transferring the blockchain representation (also known as a token) using cryptography based on the use of a public key and a private key from their blockchain address to the other person's blockchain address. A hash of a public key and some additional data (which works in a similar way to a zip code) indicate the destination of a particular transfer of value. Every public key has a private key associated with it. To approve and complete the transaction, the person uses their private key to digitally sign the transaction. The digitally signed transaction (rendered as a transaction output hash) is then bundled with other digitally signed transactions, authenticated, verified, and entered the ledger, indicating that the transaction took place in the ledger's shared copy (called a replica) on all computers in the blockchain network (Lemieux, 2019).

Opportunities of Blockchain Technology Adoption in Commercial Office Building Operation Management Process

In traditional real estate practice, the process of property management is very complex, especially when multiple stakeholders are involved. The property is managed either offline through manual paperwork or using independent software. Consequently, the information remains limited to a specific database or individual. However, with the increasing role of blockchain in real estate transactions, the future of real estate may change. Blockchain has the potential to revolutionize the way the real estate sector works, from smart contracts to managing and executing property sales and rentals to being taken over by land registries. According to Virmani et al. (2018) through the Credit Suisse report, they mentioned that blockchain technology is constantly evolving in the real

estate sector, and they believe that the areas of development are (1) ownership of real estate, (2) increased transparency, and (3) and increasing usage of smart contracts. Real estate industry players now realized that blockchain-based property management system that uses smart contracts can play a much larger role in the commercial real estate industry (Surabhi & Saurabh, 2017).

In general, it could be summarized that there are five opportunities for the implementation of blockchain technology that can be pointed out (Martijn, 2017; Barrington, 2016; Spielman, 2016; Tapscott & Tapscott, 2016). Firstly, digital records of real estates. The entire life cycle of a property can be digitized and transferred to a blockchain. Blockchain could create a system where each property has its digital passport with all information of the asset such as sales process, transaction of data, leases, maintenance contracts, property registration and many more are recorded digitally.

Secondly, redesigning real estate process. Transactions on a blockchain could be processed similarly to how payments between parties are processed using digital currencies if real estate values are stored digitally on the blockchain. Two parties could complete a transaction instantly without requiring a trusted third party to verify the transaction with a fully secure and verifiable system.

Thirdly, by creating a public transaction register, the real estate market becomes more transparent and new platforms can emerge and falling prices or other fraudulent activities can be reduced. Transparency can also come in the form of unchanging outcomes of the performance of actors in the process. Having stakeholder performance results stored via blockchain can create an immutable track record and potential new scoring system besides allow regulators and rating agencies to better understand the risks associated with real estate.

Fourthly, the use of cryptocurrencies for payment system. For example, rent payments or as a deposit for leases. The strength of software lies in its programmability. The power of cryptocurrency is that you can program it to store and distribute itself.

Finally, smart contracts that can automatically observe and implement transactions once certain conditions are met, reducing the chance of manual errors. They can reduce the number of intermediaries needed and enable automatic payment either directly from the buyer's bank account or from escrow, allowing for faster processing. Based on the agreed terms, the smart contract could automatically initiate rental payments from tenants to landlords, as well as to any contractors performing regular maintenance and requesting a maintenance notification. At the end of the lease, the smart contract could automatically transfer the deposit back to the tenant.

Conceptual Framework of Commercial Office Building Operation Management Process

The literature review demonstrates the management activities during the commercial office building operation stage, the stakeholders involved, and the potential information/data exchange throughout the process as conceptualised in Figure 1. A distinction can be made between four main responsibilities of the property manager that relate to day-to-day management of property namely, (i) financial management, (ii) administrative management, (iii) technical management, and (iv) promotional management. This is referring to Martjin (2017) and after taking into consideration the interview results from the panel of experts in real estate that define similar things.
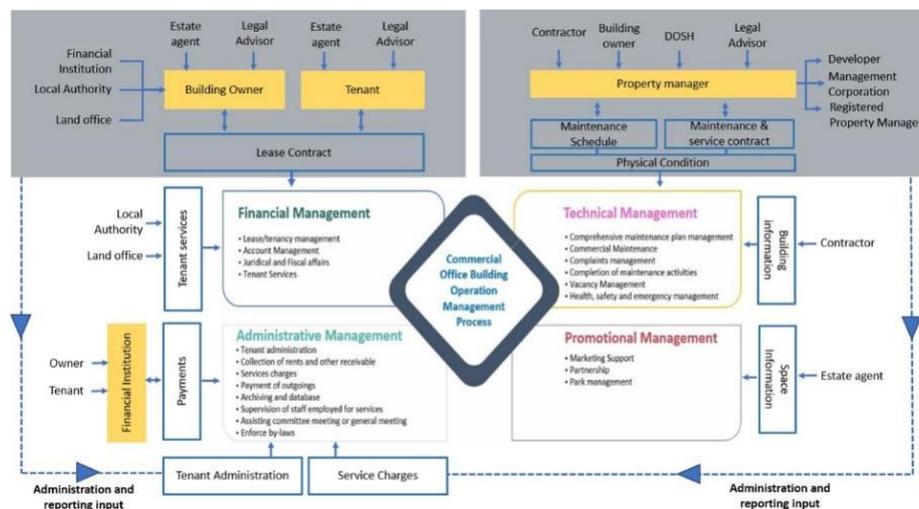
Figure 1: Conceptual framework of commercial office building operation management process
Source: Author, 2022

In financial management, the property manager is responsible for advising and coordinating the operational task to maximize the return on investment of the commercial office building including setting up a system to collect all financial data related to the management of the properties, daily contact with the tenants and other external parties, all daily operational tasks in relation to the rental of vacant space (Martjin, 2017, Van Welsens, 2012). A property manager's role in financial management may also include tenancy/lease management, including billing, rent collections and payments, tenant relations, coordination between contractors, management of utilities and services, and

overseeing the restoration of premises upon termination or expiration of the tenancy or lease term Tenancy (MPMS, 2016).

The second component of property manager responsibility is technical management aimed at maintaining and improving the desired quality level of the property. Maintenance is an important aspect of property management, and it is imperative that the building is kept in good condition and facilities are kept in optimal working order. Therefore, during the technical management, a comprehensive maintenance management program must be developed and implemented according to the customer's goals and investment strategies. A comprehensive maintenance management program of a property should include corrective maintenance, planned maintenance and service providers (MPMS, 2016).

In technical management, the property manager also takes charge as well of financial management to maintain the commercial competitive position on the market space. This is to ensure that the building is attractive for the tenant while taking into consideration the continuously changing market demand. Another responsibility of the property manager in technical management is to manage the complaints of the tenants regarding technical issues, responsible for the delivery of planned maintenance, responsible for the energy policy that consists of reducing the energy consumption in the building, responsible for health, safety and emergency issues which also become the priority (MPMS, 2016; RICS, 2017).

The next component is administrative management, including rent management, collections, utility billing, archiving the information, providing services to tenants, and providing information and reports to management. Therefore, administrative management staff need to have good financial and economic skills as well as communication skills as they are in constant contact with tenants and other parties within property management (Van Welsens, 2012, MPMS, 2016). The property manager may also aid the joint management body, management company or sub-management company in arranging and organising committee meetings and/or general meetings, subject to prior agreement with the client.

The final component is the support management, which highlights all activities aimed at improving the market position of the given asset or strengthening the owner's position towards various stakeholders. Property Manager responsibilities include assisting in the marketing of the property to ensure the building is fully occupied.

RESEARCH METHODOLOGY
Due to the explorative character of this study, this research engages with the qualitative research strategy. A qualitative method is suitable to be used when

there is a lack of information regarding the subject to be studied, and/or if the purpose of the research is to investigate the future opportunities within the subject (Corluka & Lindh, 2017). Since the implementation of blockchain in commercial real estate management in Malaysia is relatively new, Saunders et al. (2009) mentioned that the inductive research approach is a good approach to be used when the subject is new and there is little literature has been published on the related subject. Accordingly, the research methodology of this study involves two different phases I and phase II as explained below:

i) Phase I: Investigation Phase
This phase comprises identifying problem statements, formulation of research questions, establishing research objectives, and identification of the appropriate research method. The initial information is needed for understanding the whole issue and concept. In the first phase, the literature is reviewed to focus and explore on the phenomenon of blockchain technology (why blockchain technology, how does blockchain technology work, the challenges of blockchain technology implementation, potential opportunities of blockchain applications in the real estate industry and advantageous of blockchain technology application in real estate industry), which lead to the development of a conceptual framework of this study. The literature review will also cover the inventory of the current commercial office building operation management process and how it is organized (stakeholders involved during the operation management process of commercial office building and data streams required during the process).

The feedbacks, perspectives, and opinions from the experts in related areas of real estate and blockchain technology are also very important to strengthen the information relating to the development of problem statements, research objectives, and research questions of this study. Hence, the unstructured interview with the panel of experts consisting of real estate industry experts and blockchain technology experts has been conducted in this phase. This eventually leads to the development of a conceptual framework that defines the commercial office building operation management process and will highlight the potential opportunities for blockchain technology adoption in the process. The information obtained from this part allows this study to address the RQ1and RQ2.

ii) Phase II: Development Phase
This phase focuses on identifying which technologies for the storage and transferring of information and assets are used during the commercial office building operation management process and how blockchain technology can contribute. The identification will be conducted via semi-structured interviews with identified stakeholders through Focus Group Discussion (FGD). The potential stakeholders that have been identified in phase I such as building

owners, occupiers, estate agents, local authorities, land offices, contractors, legal firms, and financial institutions. The analysis thereafter is conducted to identify the opportunities for the implementation of blockchain technology in commercial real estate management to address the RQ3 of this study.

FGD is frequently used as a qualitative approach to gain an in-depth understanding of certain issues and widely used in social sciences research. A focus group consists of 3 major components: (1) A method for data collection, (2) interaction as a source of data, and (3) the active role of the researcher in creating group discussion for data collection (Morgan et al., 1996). It is the most appropriate method for the purposeful use of interaction to generate meaningful opinions, suggestions, and feedback as the group interaction might be more informative than individually conducted interviews (Creswell, 2007).

RESULTS AND DISCUSSIONS
RO1: To study the current commercial office building operation management process

The first research objective addresses the first research question of this study. Therefore, the data collected through unstructured interviews required the respondents to describe the property management activities that involve the current commercial building operations management process in Malaysia. In general, property managers' responsibilities began with the acquisition of the property, at which time due diligence, such as a building conditional survey, building defects reports, and the process of transferring all documents from the developer to the client, were all verified and reviewed. Most of the processes of commercial office building operation management as mentioned by the respondents were in line with the Malaysian Property Management Standards (MPMS) including maintenance management, insurance management, facility management, financial management as well as health, safety and emergency management (MPMS, 2016).

The division of commercial office building operation management categories that have been captured during the interview is also could be related to the established categories by Van Driel & Van Zuijlen (2016) and Martijn (2017). Based on this finding, this study adapts these categories of office building operation management processes to be integrated with the concept of blockchain technology. Each category defines the different operation management activities as highlighted by the Real Estate and Housing Developers' Association Malaysia (REHDA, 2018), Royal Institute of Chartered Surveyors (RICS, 2017), Van Driel & Van Zuijlen (2016), and Malaysian Property Management Standards (MPMS, 2016). The operation of commercial office building also requires the involvement of various parties from different fields including but not exhaustively the clients (developers / joint management body/management

corporation), the third-party contractors, financial institutions, auditors as well as legal practitioners. In summary, all required information to achieve research objective 1 has been conceptualised as in Figure 2 with some modifications from Figure 1 previously.
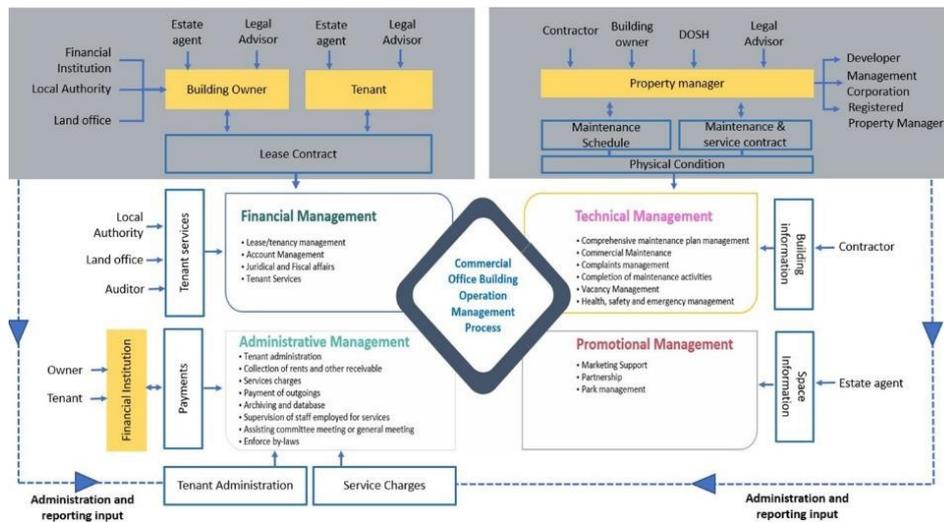
Figure 2: Conceptual framework of commercial office building operation management process
Source: Author, 2022

RO2: To examine the challenges of a property manager in managing a commercial office building.

The second research objective was addressed by investigating the challenges that interviewees experienced in managing the commercial office building. In summary, the challenges in managing the commercial office building during the operation phase could be summarised in Table 1.

Table 1: Summary of Challenges in Managing the Commercial Office Building During the Operation Phase

No	Challenges	No	Challenges
1	Lack of accessibility	10	Record keeping and security
2	Lack of transparency	11	Absence of the real-time process
3	High capital barrier	12	Inefficiency property search process
4	Third-party interference	13	Higher risk of fraud

No	Challenges	No	Challenges
5	Lack of liquidity	14	Concerns about the data sharing
6	Lengthy transactions	15	Process of strata tribunal
7	Multiple entities can modify the database	16	Conducting AGM during the pandemic
8	Complex agreements	17	Redevelopment of the strata building
9	Managing cashflow	18	Complexity in managing ongoing lease agreements

Source: Author, 2022

Among the concern brought up by respondents is the lack of accessibility due to the cost element. There is several real estate's player hooked on funds and their business are not operating in a lucrative financial model. As a result, the adoption of new technology in commercial real estate management is rather challenging owing to cost constraints. Besides that, the respondents also agree that the lack of liquidity of real estate is one of the biggest banes of real estate investments, which causes many to turn away from it. The lengthy transaction process, laced with regulatory hurdles, and high fees all contribute to the low liquidity of real estate investments.

Several entities such as owners, tenants, operators, lenders, investors and service providers are also involved in the processing and management of real estate, providing, accessing and changing a large amount of information. This creates another challenge in terms of maintaining the integrity of commercial office building data whereby multiple entities can modify the database. Apart from that, commercial real estate involves complex agreements, such as real estate leasing, involving many companies and between which several contracts have been signed. Any error or discrepancy in any of these documents can disrupt business operations and result in a loss for all parties involved.

The most typical response to the problems of maintaining a commercial office building based on the responses is the collection of maintenance fees and managing cash flow. Keeping track of things, making sure payouts are received, taking confirmations, allocating maintenance fees to units, and more makes the whole process cumbersome. This is followed by the challenges in terms of the client's lack of knowledge of technological requirements, which creates obstacles for property managers to adopt new technologies in property management. Record-keeping was also challenging as so many transactions happening.

The inefficient property search process becomes a challenge in managing real estate due to fragmented listings data. Commercial real estate agents, owners, tenants, buyers, and sellers often use multiple listing services, or MLS, to access property data such as location, rent rates, capital values, and

property features. Because all real estate contracts are paper based and trust is based on people, there is a higher risk of fraud in the real estate industry. Other challenges provided by many of the respondents when managing commercial office buildings is the process of strata tribunal and conducting AGM, especially during the Covid-19 pandemic. In the current system, both processes cannot proceed virtually without a proper system that ensures transparency.

RO3: To evaluate the potential opportunities of blockchain technology to enhance the commercial office building operation management process On top of all the benefits that blockchain technology could offer in streamlining the commercial office building operation management process, there are some other concerns from the respondents for instance regarding data sharing. Looking into the blockchain technology that is still at the infancy stage in Malaysia, the clients are quite worried on data sharing. No data protection regulations are currently available. As such, blockchain technology poses new challenges for regulators looking to protect consumers and markets, but the rigidity with which regulators in the world's major economies have approached blockchain has helped stifle innovation and growth.

According to the National Fourth Industrial Revolution (4IR) Policy (Trust No.3, Strategy 11), data integrity issues have been highlighted with updating the legal framework for personal data management and cybersecurity to build trust in society. Initiatives include introducing specific cybersecurity laws and improving laws, regulations and policies to protect personal information. To address data sharing and data security challenges, governments and heavily controlled sectors may need to create regulations for blockchain. As such, regulators across all industries need to understand technology and how it impacts businesses and consumers in their sector.

As discussed in the conceptual framework, the commercial office building operation management process is divided into four processes namely financial management, administration management, technical management and promotional management. The findings from the interview did not provide any contrary results compared to the conceptual framework. Hence, within the operational process of a commercial office building, the findings indicate that the responsibilities of all stakeholders were in line with what has been discovered in the literature review.

Based on the input from the interviewees and also result from the literature review, this study discovers two potential opportunities for blockchain adoption in commercial office building operation management process namely (i) Digital lease contract management, and (ii) Digital record on maintenance and building performance (refer to Figure 3 and Figure 4 respectively). Once the property has been acquired and handed over to the new owner/lessee, the

operational process begins, which involves four identified management phases including financial management, administrative management, technical management and promotional management. Therefore, the blockchain opportunity exists for both digital lease management and the digital record of maintenance and building performance in smart contracts, allowing for easier, more transparent and more efficient management of commercial office buildings and also cash flows.

Figure 3 indicates that there is an opportunity to have a digital lease contract during the financial and administrative management where the contractual relationship between tenants and the owner of the property through the lease contract occurs during this stage. Currently, the process of producing and validating the lease contract is conducted manually and traditionally with the involvement of various stakeholders. The lease contract needs to be signed in hard-copy form after both parties, the tenants and owners agreeing on the terms and conditions. The obligations coming from the lease agreement need to be fulfilled by both parties and all information will be administered by the property manager. While Figure 4 shows the second opportunity of blockchain integration during technical management on digital records on maintenance and building performance. Technical management aims to ensure the desired quality level of the building is well maintained and improved. The respondents reveal that during the technical management, the transactional data such as daily water pump readings, daily electricity readings, and temperature control, all could be linked to the Blockchain. It would be the health report of the building. A financial transaction such as billing, and collection can be ledged. With Blockchain, other parties cannot fudge with the data. The property manager, along with the contractors, must know what materials the building was constructed of and how to maintain those materials. Blockchain technology could be able to track the life cycle of all materials. A full supply chain of building materials can be captured during technical management, further integrating the circular economy into the real estate economy. When data is more accurate and a building's performance more insightful, service fees and owner fees can be linked to the lease via smart contracts. This allows service and owner fees to be automatically calculated and linked to payments.
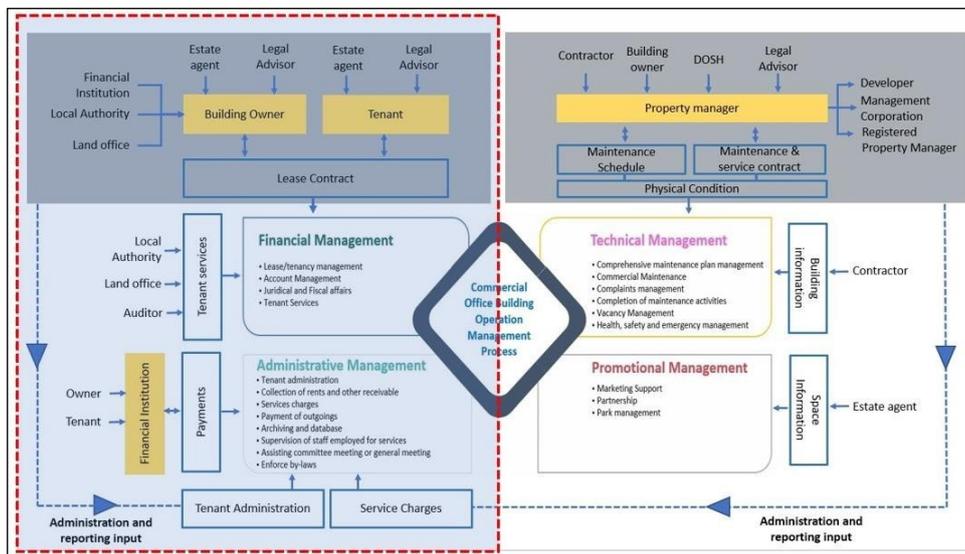
Figure 3: Potential opportunity I: Digital lease contract in financial and administrative management
Source: Author, 2022
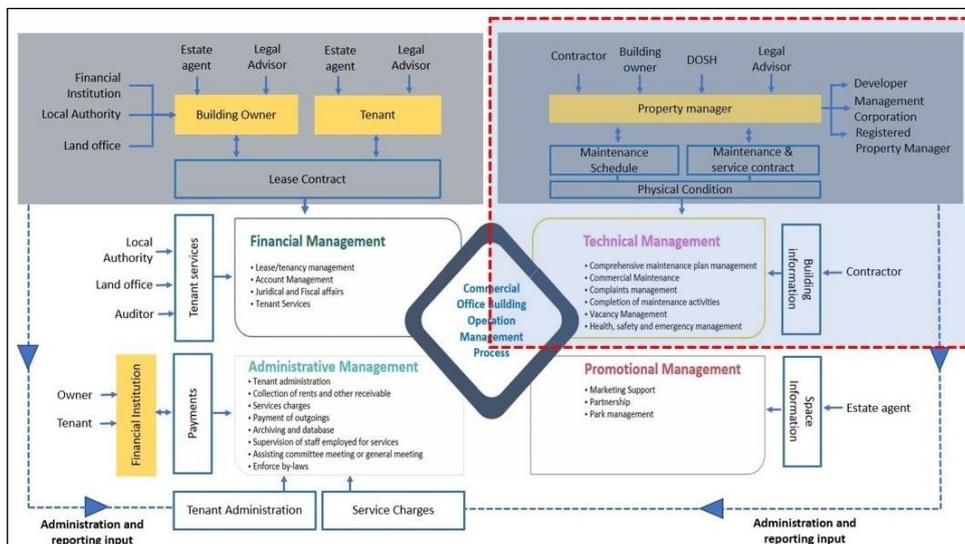
Figure 4: Potential opportunity II: Digital record on maintenance and building performance in technical management
Source: Author, 2022

On top of all the benefits gained from the adoption of blockchain technology, respondents also raised the issues to be emphasised before implementing blockchain-based real estate in general. The respondents revealed that the digitalisation of assets would become a starting point for the integration of blockchain. Nevertheless, achieving the full digitalisation of assets is seen as the biggest challenge in the whole journey of blockchain integration in real estate. The respondent mentioned that the digitisation knowledge must be levelled up before the real estate industry could embrace blockchain technology.

Another concern from the respondents is on the disruptive character of blockchain. The role of the property manager and other stakeholders such as estate agents and lawyers after the implementation of blockchain should become a focal point of the discussion. Blockchain technology claimed could limit the use of middlemen in the real estate process. The real estate industry player might think that they will lose market share, or their role will even become obsolete. In conclusion, the respondents did not provide any contrary feedback regarding the current real estate management process, as compared to the conceptual framework. Through the response obtained, there are many challenges in managing the commercial office building which required the demand for more structured information management during the operation phase. The respondents agreed about the starting point for blockchain implementation in real estate is through digitalizing the assets, which is seen as the biggest challenge. Therefore, all stakeholders need to cooperate and push behind this movement to create a blockchain environment in the real estate industry.

CONCLUSION AND FUTURE DIRECTION
This study is explorative and solely focused on the identification of the potential opportunities and also challenges for the implementation of blockchain technology in the commercial office building operation management process. The added value of blockchain technology in this study is based on a theoretical basis. Further research is essential to examine the impact of this technology on specific use cases. Nevertheless, this study provides a basis for future research by taking into consideration all the constraints and challenges for the full adoption of blockchain in the real estate industry as follows:

i) Study the parametric to implement the blockchain
 A study on the readiness of the real estate industry for the full implementation of blockchain in Malaysia needs to be conducted. The various parameter should be considered such as the digitization of the assets, the awareness of the blockchain among the industry players and their ecosystems, and many more.

ii) Technical Standards
In order to achieve broad adoption of blockchain in real estate, technical standards should be established and agreed to ensure their cross-industry compatibility. Accordingly, all stakeholders worldwide must work together to create a uniform legal and technical framework for digital assets on the blockchain. Therefore, technical standards are required to confirm compatibility between different stakeholders and industries. There is no such standardization in the real estate industry. All participants use their systems and infrastructure.

iii) Regulatory Recommendations
It is indisputable that blockchain technology is capable of introducing changes across various sectors. Hence, it has become an argumentative issue from the regulatory point of view. With the technology still undergoing major and multiple iteration processes, the government's supporting role in provisioning the regulations for the industry is very crucial to deploy the technology with minimal risks. It could stimulate the state of readiness of the whole local blockchain ecosystem and indicate Malaysia's readiness for the next blockchain-related development. Hence, there is a basic requirement for the study to look into the regulations and guidelines of blockchain implementation in Malaysia with the benchmarking with the global regulations such as the legal landscape of data protection.

iv) Study the other Opportunities of Blockchain Technology Application in Property Management
There are a lot of other blockchain technology opportunities in the property management lifecycle beyond the leasing stage including purchasing, renting, and lending the property that involves the smart contract application. The area to be highlighted is the property tokenization involving all sorts of payments made for instance rental payment transactions, deposit payments and so on.

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ASSESSMENT OF ECONOMIC WORTH OF GREEN ROOF: A CASE STUDY IN PUTRAJAYA

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Abstract

The current global temperature rise has affected local climate change issues and increased the energy usage for the building cooling process. Following this, the roof components have been identified to contribute the building heating effect due to exposure for more than 10 hours a day which at the same time secretes 70% of the sun's radiation. As an alternative, the green roof concept approach potentially reduces the effects of internal heat and operating costs of cooling the building while providing an investment return for the desired period. This study aims to measure the level of effectiveness of the building green roof concept on the building cooling rate and its profitability implications. Two objectives have been set. First, to compare the effects of concrete and green roof applications on energy consumption and operating costs for the cooling effects of air-conditioned buildings (active systems). Second, to evaluate the maintenance cost and profitability of applying the green-roofed building concept in terms of periodic return on investment. The findings of this study are seen to help the government and relevant agencies consider using the green roof concept in the physical construction of buildings in the future.

Keywords: Green Roof, Energy Consumption, Operating Cost and Return on Investment

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INTRODUCTION
The impact of the local climate on the wishes of building owners or users has led to the need for a current mode of operation that can save energy for the cooling effect of the building (active system), savings and gains in operating and maintenance costs for an irregular period. This scenario makes building designers in Malaysia begin to tend toward the concept of green buildings where innovation and improvement begin to be adapted in their output. To evaluate the effectiveness of existing green buildings, this study will look at the specific performance of the main components of the building, namely the roof of the Herald Watt University building in Putrajaya and it can be seen in picture 1.

For the implementation of this study, two objectives have been set. First, to compare the effects of concrete and green roof applications on energy consumption and operating costs for the cooling effects of air-conditioned buildings (active systems). Second, to evaluate the maintenance cost and profitability of applying the green-roofed building concept in terms of periodic return on investment. The scope of this study will focus on the roof components of case buildings as the main subject by changing the specification parameters and conductivity values of its building materials. Basically, the study aims to justify the cost of construction, operation, maintenance and investment profitability in recommending the concept of green roofs for government buildings in the future.

Picture 1: Herald Watt University building in Putrajaya.
Source: https://www.educationmalaysia.in/university/heriot-watt-university-malaysia-hwum

GENERAL OVERVIEW ON GREEN ROOF CONCEPT
The increasing energy consumption on the operation of buildings due to the increase in the local outdoor climate is closely related to the impact of the urban heat island. Among the current solutions that are considered the best is applying the green roof concept to buildings, which is one of the main criteria of green building. The decision to plant a green landscape on the entire surface of the main roof has created a natural environment that protects the construction of the buildings it shelters. The basis of the effectiveness of this concept is entirely dependent on the landscape, where periodic care and maintenance must be carried out as best as possible

Malaysia's geographical location at latitude 3.12 ºN and longitude 101.55 ºE has placing it in the group of tropical climate countries, it is easy to

experience thermal discomfort if the design strategy fails to reduce the increase in heat entering the building space (Zain et al. 2007). A study found 73% of the heat absorption rate of solar radiation is contributed by the facade of the building (U. S. DoE 2011), it is absorbed by the surface of the wall components and roof when exposed directly to the sun (Ralegaonkar & Gupta 2010). The effects of being exposed to solar radiation for more than 10 hours a day throughout the year will spread the heat of solar radiation into the interior space through the facade of the building in various directions (Ibrahim et al. 2014). R. Daghigh's study found that daytime temperatures can reach 24 ºC to 34 ºC and relative humidity between 70% to 90% can occur throughout the year (Daghigh 2015).

It is known that the effect of solar radiation on the roof surface will determine the atmosphere of the indoor environment of a building that affects the condition of its occupants ((Sadineni et al. 2011). Thus, the recommendation of strategies and accurate technical understanding must be practised to reduce the rate of solar absorption and at the same time, save the use of active energy for the internal thermal comfort of the building (Mirrahimi et al. 2016). The green roof concept approach is seen to be able to form the character and improve the current performance of the building as a method of integrating the building design with an intricate system of natural plant cultivation, either in a simple or complex way (Kamarulzaman et al. 2014). It can also create a more aesthetic eco -friendly environment to work in, increase productivity and guarantee a return on investment compared to traditional roofs (Rowe 2011).

Studies have found that the roof temperature measurement for a building without the green roof concept is around 42 ºC to 48 ºC while the green roof is around 28 ºC to 40 ºC (Niachou et al. 2001). If the roof and green walls are combined, it can lower the thermal transmittance to the interior space of the building up to 0.27 W/m2 K [13]. A study simulating the impact of the green roof concept in Malaysia found that it can reduce by 47% the temperature rise of the roof of a building (Kok et al. 2016), at the same time contributing to the energy saving of the building (Asmat et al. 2008).This also involves such as plant selection, rainwater harvesting system, pest control, accessibility, irrigation cleaning, waterproofing membrane maintenance, plants and growing medium (Zaid et al. 2022).

Construction details are also a success factor of this technology where the composition of green roof building materials must be well defined and the optimal material selected because its efficiency refers to the accessibility of the material as well as geographical location (Cascone 2019). To set the direction of the concept of green buildings that are still considered foreign, a statistical approach to the data set must be made first on rainfall intensity, substrate depth, surface coverage, climate type, vegetation types and season types on runoff retention performance (Zheng et al. 2021).

The performance and efficiency of green roofs vary according to design parameters and models developed in estimating Roof Thermal Transfer Value (RTTV) and U-values at the design stage again and adjusted according to current climatic conditions and local thermal performance evaluation index (He et al. 2021). Studies on green roofs in Malaysia have already begun as early as 1990, but this technology has not been fully accepted, and therefore, the government should set the percentage of its application in development in urban areas (Isa et al. 2020). Due to the dense development density in the city, it becomes a strategic factor in implementing green roofs because of its benefits of reducing the effects of greenhouse gas emissions, the effects of urban heat islands and air pollution (Zaid et al. 2022). Overall, the green roof concept is one of the specific approaches to a building to reduce the internal thermal effects and operation costs of cooling the building while providing an investment profit for the desired period.

RESEARCH METHODOLOGY

There are two methodological frameworks for this study, on-site measurements and building modelling simulation. For the on-site measurements, the acquisition of actual case-building data is the core information in making the basics and developing the feasibility of the study assumptions. A room under a green roof measured the heating effect of its surface and indoor air temperature. These reading records were measured comprehensively over three consecutive weeks (7 to 21 October 2021) to record data and to read patterns. Internal thermal performance is influenced by air temperature factors and is supported by wind velocity and relative humidity. For the study, the focus will be to pay special attention to the indoor air temperature that affects the cooling of the space and its operating costs.

Meanwhile, for building modelling simulation, the simulation results for this study are numerical, where the simulation engine is based on thermodynamic standard equations in the Apache module of Integrated Environmental Solution-Virtual Environment (IES-VE) software. 50 interior spaces were constructed and set with the actual building material specifications and air conditioning system service. Building location input, local climate information and building materials were adjusted at the beginning of the simulation process. Finally, the simulation results have generated energy values for cooling the entire building and estimated operating costs for a year.

RESULT AND ANALYSIS
a. Simulation effect of green roof on the study building
The priority of the study is to compare the effect of a green roof with a concrete roof on 50 rooms and space compartmentation (lecture room, office and all

occupied spaces) by applying an air conditioning system starting from 6.30 to 18.30 on 29 March 2022 (the highest air temperature reading in the previous simulation result). The building's central air conditioning system was activated during the daytime working session with a fixed value of 26.0 ° C.

b. Mean radiant temperature (MRT) simulation results
Mean Radiant Temperature (MRT) is the effect of temperature refraction from the surface around the room's perimeter with its conductivity value and u-value. From the simulation result, the MRT readings for green-roofed and concrete-roofed buildings have almost the same pattern for promenade level, ground level and level 1. However, it differs on level 2, where this level interacts continuously with the roofing material. At the same time, a reading difference of around 1.84% between green-roofed buildings and concrete-roofed buildings has been successfully recorded. The impact of the MRT temperature difference for these two roof categories has shown that the performance of green-roofed buildings can curb the effect of MRT temperature, especially at level 2 (highest level) and lower the MRT temperature for promenade level by 0.18%, ground level by 0.11% and level 1 by 0.57%. Figure 1 explains the statement that has been revealed.
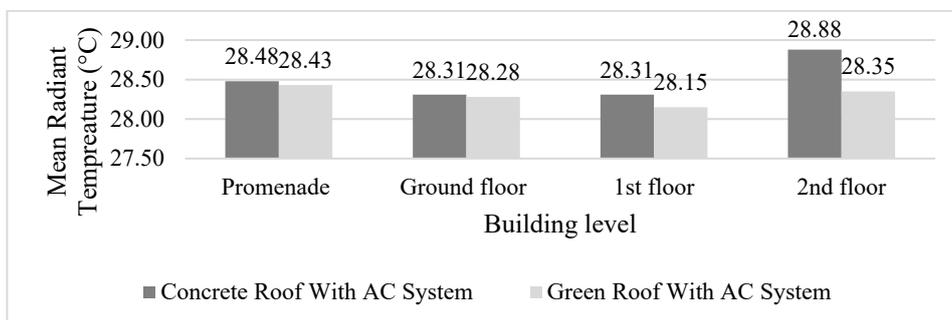
Figure 1: Comparison of simulation results for average MRT temperature for 4 levels of study building on 29 March 2022 from 6.30 to 18.30.
Source: Authors (2022).

c. Conduction gain simulation results from the roof component
Referring to figure 2, the pattern of average energy rate readings resulting from this green and concrete roof heating effect has shown a decreasing similarity starting from 6.30 am to 10.30 am, then it started to show a very significant energy reading difference up to 18.30 am. This scenario is due to the solar impact reception factor that begins to increase and accumulate on the roof components and at the same time, secreted into the interior. In this situation, the green roof has shown its positive performance at the critical time, starting from 11.30 am to 18.30 (8 hours).
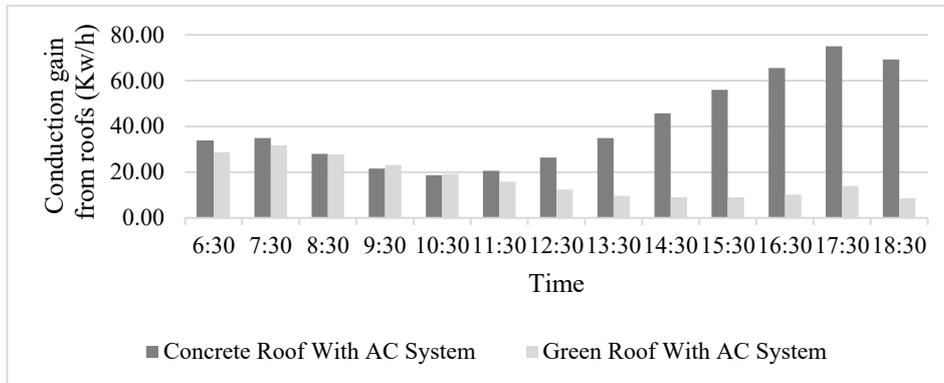
Figure 2: Comparison of the conduction gain at level 2 roof between
green and concrete roof on 29 March 2022 from 6.30 to 18.30.
Source: Authors (2022).

For 13 hours a day with the activation of the air conditioning system, the observation found a significant difference in the conduction gain (roof) reading for the concrete-roofed floor 2 space with the green-roofed space at 310.88 Kw/h in total. Here, an energy-saving rate of 41.36% (530.14 Kw/h / 219.26 Kw/h) was created after optimizing the function of the green roof on the study building. This situation can be seen clearly in table 1 as shown.

For the estimated cost of cooling the entire space on level 2, this study referred to TNB Malaysia's medium commercial tariff (from excel – TNB rate) for one year. A building with a concrete roof will cost RM 4,644,026.40 (10,602.80 Kw/h x RM 36.50 x 12 months) while the green roof is RM 1,920,717.60 (4,385.20 Kw/h x RM 36.50 x 12 months). Overall, cost savings per year with a value of RM 2,723,308.80 or 41.36%, can be achieved if the green roof concept is applied to the study building.

Table 1: Comparison of conduction gain readings for the space on level 2 of the study building with green roof and concrete roof.

Room condition on the 2nd floor	The conduction gains from roof component for level 2						
	Minimum Reading (29 Mac 2022)		Maximum Reading (29 Mac 2022)		The average of energy formed per day / 13 hours (29 Mac 2022)	The average of energy formed per month / 20 working days	The average of energy formed per year / 12 months
	(Kw/h)	Time	(Kw/h)	Time	(Kw/h)	(Kw/h)	(Kw/h)
Concrete roof with AC system	18.67	10.30	74.99	17.30	530.14	10,602.80	127,233.60
Green roof with AC system	8.58	18.30	31.76	7.30	219.26	4,385.20	52,622.40

Source: Authors (2022).

d. Simulation results of conduction gain results for the entire building

To comprehensively compare the green roof effect's performance with concrete, the results of conduction gain simulation data will be divided by level. This aims to facilitate comparisons and see the relationship. Referring to figure 3, the reading patterns for the two roofs at promenade level, ground level and level 1 seem to be the same but very different for level 2. An extensive reading gap of 310.88 Kw/h is formed at level 2 and this indirectly proves the effectiveness of green roofs in reducing the employment rate of space cooling.

It is very clear from the simulation results generated that a high energy rate exists at level 2 or more specifically, under the main roof that shelters the space. Previous studies have proven that roofing in tropical climates will contribute to 70% of the thermal effect and it will increase the high energy rate for the cooling effect (Al-Obaidi et al. 2014). In this study, the reading of the concrete roofed floor 2 space has shown an increase of 50.33% (reading 2 level / total reading for all level, sheet kW/h) of the total building energy generated, while the green-roofed building level 2 is around 30.14% (reading 2 level / total reading for all level, sheet kW/h).

The estimated cost breakdown for cooling a green-roofed or concrete building either by building level or the entire building can be seen clearly in table 2. Overall, a saving of RM 2,855,059.20 for one year will occur if green-roofed buildings are utilized as much as possible compared to concrete roofed buildings only.
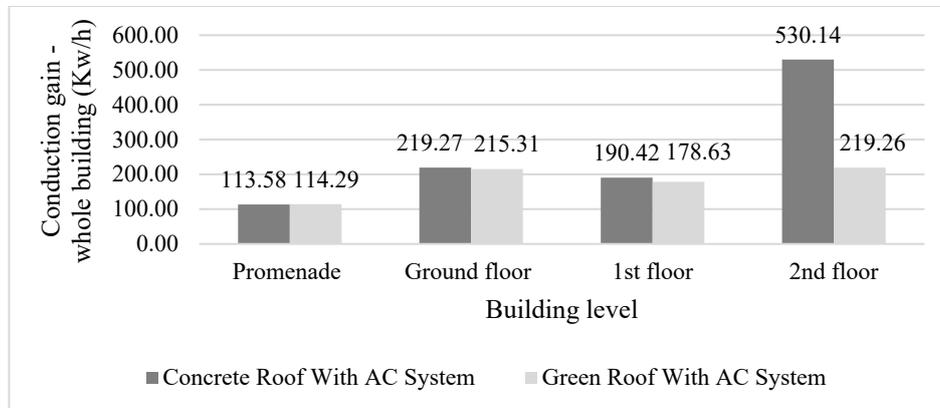
Figure 3: Comparison of the conduction gain for the whole building between green and concrete roof on 29 March 2022 from 6.30 to 18.30.
Source: Authors (2022).

Table 2: Comparison of conduction gain readings for the whole building between green roof and concrete roof.

Building condition	Building level	The average of energy formed / Kilowatt / hour (Kw/h)			Cooling cost by building level (RM)	Total cooling cost for whole building (RM)
		Per day / 13 hours	Per month / 20 working days	Per year / 12 months		
Concrete roof with AC system	Promenade	113.58	2,271.60	27,259.20	994,960.80	9,227,871.60
	Ground	219.27	4,385.40	52,624.80	1,920,805.20	
	1st floor	190.42	3,808.40	45,700.80	1,668,079.20	
	2nd floor	530.14	10,602.80	127,233.60	4,644,026.40	
Green roof with AC system	Promenade	114.29	2,285.80	27,429.60	1,001,180.40	6,372,812.40
	Ground	215.31	4,306.20	51,674.40	1,886,115.60	
	1st floor	178.63	3,572.60	42,871.20	1,564,798.80	
	2nd floor	219.26	4,385.20	52,622.40	1,920,717.60	

Source: Authors (2022).

d. Maintenance of green roofed building

The effectiveness of the green roof concept can only be achieved if the grassy area coverage surface can be kept consistently fresh at all times. Therefore, periodic maintenance and treatment must be made and recommended to be carried out by a competent contractor. The total green roof area for this study building is 10,126.15 m², it starts from ground level to shades the space on level 2. The basic cost estimate refers to the maintenance price list of the Public Work Department (PWD) and the National Landscape Department found that the

maximum cost of the entire green roof for one year will amount RM 2,284,432.88. The details of work and prices can be referred to table 3.0.

Table 3: Details of work and maximum estimated price for green roof maintenance for a one-year period.

Scope	Unit	Coverage	Period	Work price (RM)	Cost (RM)
Grass watering	m²	10,126.15	2 times / month	0.80/ m²	1,944,194.88
Grass fertilization	m²	10,126.15	4 times / year	5.90 / m²	238,977.00
Replacement and replanting of sized grasses	m²	5,063.08 (50% from 10,126.15 m²)	1 time / year	20.00 / m²	101,261.60
Estimated total cost					2,284,432.88

Source: Authors (2022).

e. The energy saving costs generated from the green roof effect
Based on the financial aspect, a profit to the owner or user of the building of RM 570,626.32 per year can be obtained if the operating cost of the concrete roofed building is deducted from the operating cost of the green-roofed building. The details of this figure can be seen clearly in table 4.

Table 4: Details of operating costs and building profits obtained for one year if the green roof concept is fully practiced in the study building.

Building condition	Cost per year (RM)	Building operating cost benefits (RM)
Concrete roof with AC system	9,227,871.60	-
Green roof with AC system + maintenance of green roofed buildings	8,657,245.28 (6,372,812.40 + 2,284,432.88)	570,626.32

Source: Authors (2022

f. Return on investment for the green roof
Referring to item e which is the cost of profit obtained from energy savings for the cooling effect of concrete roof compared to the green-roofed buildings, a plan on the return on investment (ROI) value of green roofs can be calculated roughly. Meanwhile, the information in table 5 submitted by Putrajaya Holding (PJH) which is the final construction cost value for the green roof system of this study building is worth RM8,200,000.00 without being mixed with maintenance costs

with the optimal green roof application profit cost value of RM 570,626.32 for a year, period return on investment for the green roof will take 14.4 years. Maintenance cost is subjective in a project because it is subject to the method, level of frequency or care as well as current provisions. Therefore, this matter should be calculated separately and not mixed with the assessment of ROI for the green roof.

Table 5: Details of the final cost of construction and maintenance of a complete green roof system from PJH

Construction / maintenance	Details	Cost (RM)	Total cost (RM)
Green roof system (curve roof + flat roof + glass canopy + observation deck)	Structural & architectural works	6,500,000.00	8,200,000.00
	Landscaping works	1,500,000.00	
	Irrigation sprinkler system	200,000.00	
Maintenance costs	Cost per month	3,000.00 / month	36,000.00 / year

Source: Authors (2022

g. Conclusion

The analysis found if the effect of conduction is assessed on the entire floor level on the second floor, which is under the concrete roof for a year, the energy consumption of 127,233.60 Kw/h is required, while the green roof requires 52,622.40 Kw/h only. The significant difference in the cumulative value of this year with a reduction of 58.64% in energy consumption is additional support that further strengthens the performance and efficiency of the green roofs studied.

In terms of operating costs to cool the entire building for a year, especially during working hours from 06.30 to 18.30, the concrete roof will cost RM 9,227,871.60, and the rain roof is RM 6,372,812.40. Cost savings of RM 2,855,059.20 or 30.94% will be achieved if this green roof concept is applied compared to concrete-roofed.

However, the foundation of the potential success of this green roof requires cost and periodic maintenance by a competent party appointed by the building owner to ensure that all green plants on the roof surface live lushly and consistently. The study estimates the cost of RM 2,284,432.88 per year for the overall maintenance work for the green roof. If the operating cost of cooling the building and the maintenance of the green roof is combined, the total of RM 8,657,245.28 is still below the concrete roof operating cost of RM 9,227,871.60. Here, net savings can be obtained of RM 570,626.32 per year and refers to the allocation of the green roof construction cost of case building of RM 8,200,000.00, a period of 14.4 years is required to obtain investment profit to build this green roof from the net profit of RM 570,626.32.

This study has successfully proved the benefits of applying the concept of green roof in the study building on the value of building cooling energy consumption, cost savings, and operation, as well as return on investment for the period considered relevant. Therefore, it is recommended that the design of the building in the future consider the impact of the green roof design that can benefit the building owner and its users' well-being in the future. In line with current government recommendations, the issue of energy savings and building operating costs can be optimally achieved with building functionality.

ACKNOWLEDGEMENTS

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THE IMPACT OF URBAN RIVERFRONT DEVELOPMENT ON INDUSTRIAL PROPERTY MARKET VALUE: A GIS APPLICATION

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Abstract

The impact of Urban Riverfront Development (URD) affords an increasing of value for adjacent industrial properties within riverfront area. However, the impacts in terms of percentage of increment value, radius of impact coverage, distribution of industrial properties that effected by URD are difficult to be evaluated without using an appropriate tool. Hence, this study evaluates the impact of URD on industrial property market value aided by Geographic Information System (GIS). Therefore, Melaka River, Malaysia has been chosen as a case study to evaluate the impact of URD towards industrial property market value for adjacent properties within riverfront area. The result shows there is 14.13% of increment of market value for adjacent 1.5-storey factories located within 300-meter radius from URD. The result discovered that there is positive effect on increment market value for the industrial properties within URD area.

Keywords: Urban Riverfront Development, Industrial Property, Market Value, Geographic Information System

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INTRODUCTION

Urban Riverfront Development (URD) is specifically identified as riverfront development which located within an urban area. Riverfront development within the urban areas is one of several nature-based social infrastructure developments which has capability to spur the social and economic growth within the river area (Abdullah, 2002). Typically, the development of URD always associated with other mix development surrounding riverfront area such as properties buildings including commercial, residential, industrial as well as infrastructure development as it contributes to regional economic growth. It is due to the URD have potential to spur economic development within surrounding area. According to Davidson (2009), in numerous countries around the world, the water edge regions grew sooner than different zones and turned into an advantageous area for the development of urban areas. As per Otto, et al. (2004), rivers have been used for urban settlements in North America due to crusade of the community trades relied on waterway transportation. In addition, the rivers were continually being an essential element of the urban area as it used as a transport network in North America (Davidson, 2013). Therefore, this paper focuses on the impact of URD toward industrial property market since it has rarely emphasized in deliberating on the development of economic growth of the country.

LITERATURE REVIEW

1. Impact Assessment of URD in Malaysia

Impact assessment is an assessment that frequently conducted to assess impacts or any consequences if any development projects, policies and programmes (Chadwick and Glasson, 2017). This assessment is essential in order to ensure 1) the development projects are being managed efficiently; 2) the policies and programmes are beneficial to stakeholders; and 3) the verified impacts are promoted to related stakeholders (Streatfield and Markless, 2009). Impact assessment has been practiced more than 40 years since the sketch out of National Environmental Policy Act 1969 (NEPA) in USA up to now (Nolon, 1996). In Malaysia, impact assessment tools used for assessing social, economic and environmental indicators are fairly confusing depiction among practitioners and stakeholders in Malaysia. The problem occurs when the practitioners utilize SIA tool to assess the social indicators, at the same time it's been included together with the economic indicators. This issue affected the impact assessment practice particularly in assessing the impacts of the URD in Malaysia. Therefore, based on issues that impeded the impact assessment practice in Malaysia, this study is trying to emphasize economic aspect within impact assessment practice for URD in Malaysia.

2. Property Market as a Vehicle of Economic Growth

Economic growth often associated with real estate industry. Then, property market is one of economic indicators within real estate sector as it drives the economic growth of the country. Furthermore, URD has capability to boost up real estate industry due to support property development and redevelopment either commercial or residential as well as industrial properties within adjacent riverfront area (King's Lynn Marina Master Plan, 2007; Smoky Hill River Renewal Master Plan, 2010). According to Olszak Management Consulting et al. (2012), the development of URD frequently involves new development within riverfront properties and thus, it is desired to carry out several analyses that related to property market. For Lehigh Riverfront Master Plan which proposed for city of Allentown, Pennsylvania, the types of property development came after URD development are retail, restaurant, entertainment, hotel and housing or residential scheme area. It demonstrates that the development of URD encourage more property development along the river.

3. URD affects Industrial Property Market Value

As discussed in above mentioned, there are numerous literatures had proved that the development of URD increases property value of riverfront properties (Gross et al. 1981; Jones, 1998; Stein 2001; Nicholls, 2001; Anderson and West, 2006; King's Lynn Marina Master Plan, 2007; Hui et al., 2007; Hui, et al. 2009; Saayman, et al. 2009; Wallner, 2013; and Huang, 2014). This is due to the uniqueness of the URD as a valuable natural resource located within the urban areas with regards to sustainable urban infrastructure development able to be beneficial to surrounding neighborhood area includes local community Abdullah (2002) and Hussein (2009) and simultaneously influences the value of the adjacent properties (Sasaki Associates, 2015). As supported on the location issue, there are many researchers had emphasized that the location is an essential factor that determines the property value (Gallimore et al., 1996; Anderson and West, 2006; Samaha and Kamakura, 2008; Value, 2010; Icano and Levinson, 2011; Kovack, 2012; and Adegoke, 2014). In this regard, the property located within the URD areas will be have a great opportunity to increase the value.

RESEARCH METHODOLOGY

This study utilizes spatial analysis to measure the impact of URD on industrial property market value. The assessment considered the spatial elements within the case study area that has been conducted through graphical visualization which has been displayed via maps. Among of the analyses involved in spatial measurement are overlay analysis, buffer analysis and viewshed analysis. All the technical analyses have been conducted to produce spatial distribution map for the industrial property buildings along Malacca River. Then, to quantify the increment of industrial property market value of adjacent riverfront properties,

the riverfront properties has been observed and evaluated in terms of 1) location of the properties (i.e., inside and outside the buffer zone); 2) property values (i.e., property prices ranges) for the industrial properties within URD area (i.e., 1.5-Storey factories). Ideally, this assessment is initially carried out based on a technical procedure known as geo-coding to assign the location points of each riverfront properties (i.e., longitude and latitude). This procedure has been carried out using google map and ArcGIS 10.4 software. By utilizing the properties owners' address that has been taken from sale transactions' database, the actual locations of the properties have been assigned in the map as per real world. This procedure involved a total of 8000 of sale transactions in year of 2016.

Finally, a simple statistical analysis has been used to calculate the extent to which the increment in industrial property value effected by URD. For the assessment during this phase, the location and position of the properties are considered and observed either it located inside or outside the buffer zone. For the spatial assessment and measurement, it was based on suggestion by [29] which identified an effective distance for a single buffer zone in effecting the URD is within 300 metres radius from the river. Therefore, this study used this distance for the analysis.

FINDING AND RESULTS

Fig. 1. illustrates the impact of URD on industrial property market within riverfront area. Based on the figure above, the allocation of industrial properties (i.e., 1.5-storey factory) within URD area was differentiated by the river segment's catchment area (i.e., buffer zone of 300 metres radius) which has been showed in different color on the map. From the sale transaction's database, it revealed that the price ranges of industrial properties which located inside the buffer zone are higher than properties located outside the buffer zone even though it has the same built-up area in ranges of 180-300 square metres. The identified price ranges of the inside and outside catchment area are different with RM5250,000 – RM1,630,300 and RM235,000 – RM1,400,000 respectively. It meant that there were influenced by locational attributes within the URD area that able to increase the value of the affected properties. This circumstance had also supported by previous literatures which had stressed that the URD development provides beneficial impacts on surrounding neighbourhood (Nicholls, 2001; Anderson and West, 2006; and Zhang et al., 2011) includes enhanced the value of adjacent riverfront properties (Gross et al. 1981; Jones, 1998; Stein, 2001; King's Lynn Marina Master Plan, 2007; Saayman et al. 2009; Smoky Hill River Renewal Master Plan, 2010; Nai and Sargent, 2013; and Huang and Kao, 2014).
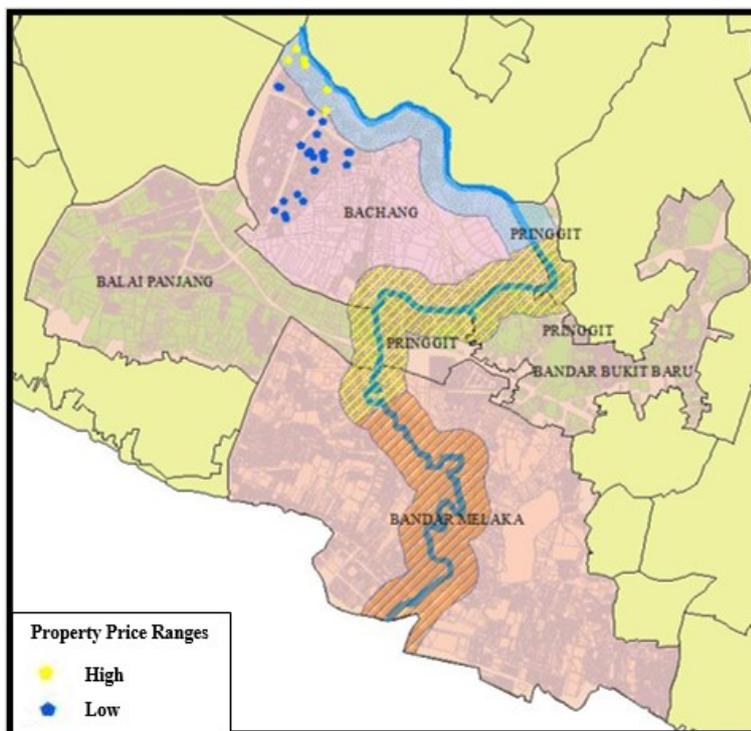
Figure 1: Result of URD impacts on industrial properties within river catchment's area
Source: Researchers (2019)

Table-I: Increment Value of Industrial Property Buildings

Property/ Building Types	Price Ranges		Increment Value (%)
	Inside Buffer Zone	**Outside Buffer Zone**	
Industrial / 1.5 - Storey factory	RM250,000- RM1,630,300	RM235,000- RM1,400,000	14.13

Source: Property Sale Transaction 2018 of Malacca Tengah Area

Table I shows the increment value of Industrial property buildings (i.e., 1.5-Storey factory) of adjacent riverfront area. Based on the above table, the finding had revealed that there was an increasing of property market values for industrial property buildings were located inside the buffer zone (i.e., within 300 metres radius from the URD). According to the results, it has indicated that the percentage of increment value for industrial property buildings of 1.5-storey factory is 14.13%. The finding demonstrated that it has positive impact in term of property market value for industrial property buildings along the riverfront area. It was identified that the neighbourhood location and its attributes had

influenced the industrial property buildings along Malacca River and thus, increased the property market value of the adjacent properties.

CONCLUSION

Overall, this paper discussed the nature of impact assessment of URD in Malaysia. Then, it continued with emphasizing of property market as a driver of economic growth and it has further conferred on the impact of URD on industrial property market. Furthermore, it deliberated the increment value of the industrial property buildings along riverfront area based on its location. From the findings, it could be suggested that the impact assessment of the property development (i.e., URD) have to focus more on property market instead of other indicators. It was due to the property market indicator showed huge impact to reflect on URD development. However, the other indicators such as social, demographic, environmental attributes, government policy etc. cannot be simply left behind as it has interconnected with socio-economic growth especially within an urban area.

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DISASTER RESILIENCE SCORECARD FOR OFFICE BUILDING IN MALAYSIA TOWARDS REDUCING FLOOD RISKS

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Abstract

This study is aimed to provide an approach for measuring the resilience of office buildings against flood in Malaysia. Three states were chosen namely Kelantan, Pahang, and Johor as they had been badly affected by the major flood in 2014. From the three states, nine worst-hit districts had been identified, which are Kota Bharu, Pasir Mas, Kuala Krai in Kelantan, Kuantan, Temerloh, and Pekan in Pahang, along with Batu Pahat, Kota Tinggi, and Mersing in Johor. The Disaster Resilience Scorecard for Industrial and Commercial Building is adapted to construct the scorecard. The essential elements were examined with regards to the office buildings within the scope of flood in Malaysia. This study used Survey questionnaire as a method in constructing the scorecard which was distributed among the managers or person in charge of the office buildings management within the study areas. The results from the survey questionnaire reflected the significance of every component in the essentials, thus relevant to be included in the final scorecard.

Keywords: flood; office building resilience; Disaster Resilience Scorecard for Office Building

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Disaster Resilience Scorecard for Office Building in Malaysia Towards Reducing Flood Risks

INTRODUCTION

2021 has witnessed a major flood event that hit several states in Malaysia such as Selangor, Pahang, Malacca, and Johor. Department of Statistics of Malaysia had announced the total loss of RM6.1 billion due to this flood event and Selangor had been most badly affected state, with the total loss of up to RM3.1 billion, followed by Pahang (RM593.2 million), Malacca (RM85.2 million), Negeri Sembilan (RM77.1 million) and Johor (RM50.1 million). The losses include living quarters, vehicles, business premises, manufacturing, and agriculture sector as well as public assets and infrastructure. Among those public assets were the office buildings that were hit by the massive flood. The phenomenon of massive rainfalls (Abdul Halim et al., 2015) and succeeded flooding did not only make rise of climate change issues and it impacts on the environment, but also raise more local issues on the effects towards ecological, residential property development and price, and the capability of the owners to secure finance and insurance for their properties. Meanwhile, other relevant indicators of flood asperities are the inundated houses, injuries, death of a relative, the degree of damage, along with direct, indirect, tangible, and intangible losses (Alderman et al., 2012).

Malaysia is very vulnerable to flood, particularly during the Northeast Monsoon which frequently affected the states on the East Coast of Peninsular Malaysia such as Kelantan, Pahang, and Johor. Floods have been categorised into three types such as river flooding, flash flooding and coastal flooding (Shafapour Tehrany et al., 2017). In monsoon season, majority of the districts in those states will experience flood, but the degree of the flood varied, subjected to the number of rains received, and other factors such as climate change and global warming. Global warming has caused the over the last century has led to the occurrence of heat extreme which happened once every 1,000 days in the past, to four to five times more often in the recent years (Fischer and Knutti, 2015). Extreme weather seems to be increased and at the same time, affected the water availability, thus influencing the abundance of water. The frequency of flooding in Peninsular Malaysia and the damage caused can be significantly related to the property damage and service disruption. Properties that have been physically destroyed, as stated by Jonkman et al. (2008) will need higher cost of repairing and maintenance to operate which could directly affect the value of the properties. Apart from that, flood could cause disruptions to the amenities and facilities to accommodate the community, mainly the road transport infrastructures (Pregnolato, et al, 2017).

To date, most of the studies on the resilience were focused on residential and community, such the study on the Flood Hazard information map using GIS for residential community resilience (Zulkarnain et al., 2019) and Yusmah et al. (2020) with their study on understanding urban flood vulnerability and resilience.

Hence, this calls for a study to be conducted on the office buildings that have been affected by the flood as they possessed the same risks and losses as the residentials buildings. Additionally, office buildings need to be resilient as they served as places for storing private and confidential documents, and operating the public works, as well as administrating tasks.

LITERATURE REVIEW

The World Risk Index Study published in 2016 put Malaysia in 86th place out of 171 countries which has the highest risk of natural disaster including storms, flood, drought, earthquake, and sea level rise in which the index comprised four elements which are exposure (to natural disasters), susceptibility, coping capacities, and adaptive capacities (Garschagen et al., 2016). Guha-Sapir et al. (2016) stated that floods had brought severe impacts regarding damages with the economic losses related to discrete incidents was ranging from 11 to 600 million US Dollar whilst the total number of affected individuals which required instant relief during emergency period had extend hundreds of thousands. Flood incidents will fundamentally bring detrimental effects on the value of the property (Aliyu et al. 2016), as the flood can damage the buildings and destroy the surroundings (Osti & Nakasu 2016).

According to Arbon (2014), 'resilience is a process of ongoing commitment which develops readiness preceding to a catastrophe which provides positive recovery later'. Djalante et al. (2013) had observed the manner of resilience thinking that managed to change the traditional paradigm of disaster risk reduction towards more integrated and multi-disciplinary, incorporated natural and social sciences with humanities, which permitting it to go beyond response and recovery to preparedness and prevention. There are in depth relative and absolute risk assessment methods available (Ettouney & Alampalli, 2012) apart from the probabilistic or deterministic risk assessment methods (Fenton and Neil 2013). It is possible to use any or all these methods for resilience assessment. Since resilience is based on the 4Rs, according to the American Institute of Architect (2016), the parameters of each of the 4Rs in each asset need to be determined, and the desired methodology (which can be borrowed from any desired risk methodology) must be followed. After that, computing an objective or subjective resilience rating can be achieved in a simple and accurate manner.

Before going deeper into the building resilience, it is best to look at the definition of office building first. As defined by NAPIC, office building or Purpose-Built Office (PBO) is a building in which 75% of the rentable unit is used for office purposes. The net lettable floor area is measured to match the Uniform Method of Measurement of Buildings from the Royal Institution of Surveyors Malaysia (RISM). An office is usually known to be the place where the clerical work is conducted and abundant types of written documents such a

letters, correspondences, files, and record were managed and handled (Chopra D & Gauri, 2015). It is regarded as the place where all various kinds of clerical tasks took place in organising and administrating the organisation's whole matters.

In 2012, a balanced Scorecard for communities specifically designed to evaluate their disaster resilience by utilising an all-hazards strategy was developed by the Torrens Resilience Institute (TRI). The Scorecard evaluates four components of community resilience which are connectedness, risk and vulnerability, procedures that support disaster planning, response, and recovery (PRR), and it resources. Recently, different organisations have constructed frameworks for disaster resilience (Arbon *et al.* 2014), and the detailed discussion on those measures had been reported in a review by the United Nations Development Programme (Winderl 2014). In 2012, the TRI developed the Community Disaster Resilience Scorecard and Toolkit: a balanced tool for communities to assess their disaster resilience using a participatory methodology with facilitated by the local communities (Arbon *et al.* 2012).

For the purpose of this study, the Disaster Resilience Scorecard for Industrial and Commercial Building (building Scorecard) which adapted the Disaster Risk Reduction strategies from the United Nations Office for Disaster Risk Reduction (UNDRR)'s. This scorecard can be used by the owners, managers and operators of office buildings and campuses in Malaysia, from the government and private sectors. The Scorecard provides a set of assessments that allow local governments to assess their disaster resilience, structuring around UNDRR's Ten Essentials for Making Cities Resilient. It also aids in monitoring and reviewing progress and challenges towards implementing the Sendai Framework for Disaster Risk Reduction: 2015-2030 and contributes basic analysis for planning the disaster risk reduction and resilience strategies. It provides the prospective for scoring at the preliminary and detailed assessment levels.

METHODOLOGY

1. The survey questionnaire was developed by adopting the appropriate essentials in the Disaster Resilience Scorecard for Industrial and Commercial Building (building Scorecard) by the UN ARISE. Likert Scale was used, ranging from not important at all to most important to measure the importance of each component in the essentials
2. The Cronbach's Alpha test was conducted to validate the questionnaire
3. The questionnaire was distributed to the building managers or the person in charge of the building management through Google Form as the survey was taken place during the Movement Control Order (MCO) period in Malaysia

4. The responds collected were analysed using the descriptive analysis method by determining the percentage of each component in the essentials
5. Disaster resilience scorecard for office building was constructed based on the importance level of the essentials from the questionnaire.

RESULTS AND FINDINGS
1. Section A- Background of the building
Section A consists of a survey questionnaire that have been distributed to the respondents in the states involved in this study. In the first part of the questionnaire, the questions were related to the background of the buildings in the research areas. From the results, majority of the building aged 10 – 20 years, followed by more than 20 years. Throughout the 20 years, some of the buildings were badly damaged during the major flood that hit the east coast of peninsular Malaysia in 2014. Most of the office building are 2 – 3 storeys high. Hence, the building did not really affect by the flood. Majority of the building in this study were located near the river. Thus, they are more likely to be affected by flood during monsoon season.

Majority of the office buildings carried out all the related work of office which made them eligible for this study and majority of the building are managed by the government. Majority of the office buildings had been hit by flood less than once a year, while only 8% of the building were flooded more than once a year. This indicated that all the buildings were affected by flood, but the degree of the damage varied according to the location of the building. Some of the buildings were badly affected by major flood while some of them only suffers minor damage. The results are as follows:

Table 1: Summary of building background

Component	Percentage		
Age of building	Less than 10 years	10 – 20 years old	More than 20 years old
	25%	45%	30%
Height of building	Single storey	2 – 3 storeys	More than 3 storeys
	18%	54%	28%
Frequency of flood	Less than once a year	Once a year	More than once a year
	74%	18%	8%

*Siti Uzairiah Mohd Tobi, Nurul Huda binti Zakaria, Khamarrul Azahari bin Razak, Rozaimi bin Che Hassan,
Che Siti Noor Binti Koh Poh Lee @ Che Mamat, Rashdan Bin Rahmat*
Disaster Resilience Scorecard for Office Building in Malaysia Towards Reducing Flood Risks

Component	Percentage	Component
Management of the building	**Government**	**Private**
	53%	47%

2. Section B – Questions Related to Disaster Resilience Scorecard for Office Building

There are seven essentials related to the management of the office building in the survey questionnaire. A total of 80 buildings have undertaken the survey and the results to according each essential is presented in the form of percentage to determine the importance of every component in the essentials towards enhancing the resilience of the office building. The results are presented in the tables below:

1. Essential 1 - Developing and Maintaining the Office Building Resilience in General

Overall, all the five components of the essential were agreed by the respondents to be important aspects in developing and maintaining the office building resilience in general. It also had been reflected in the current practice of the office building management in which all the essentials were adopted in the management of the buildings. Thus, this essential is suitable to be used in developing the disaster resilience scorecard for office building in Malaysian context.

Table 2: The Percentage Level of Importance According to the Components in Essential 1

Components	Level of Importance (%)			
	Less Important	**Slightly Important**	**Important**	**Very Important**
Have the plans to develop the resilience of the building towards disaster whether independently or with the involvement of other agencies	3.3	3.3	37	57
Coordination of the building owner/manager in any disaster management programmes	3.3	5	35	57
Establishing resilient plan by appointing individual/group to coordinate the resilient response & recovery plan with the stakeholder	3.3	6.7	45	45
Coordinating resilient plan and changing relevant information with the stakeholders	3.3	3.3	48	45
Building manager is responsible to report the hazardous materials inside the building and its surrounding	3.3	3.3	38	55

2. Essential 2 - Identifying, Understanding, and Utilizing the Current and Future Risk Scenarios.

Majority of the respondents agreed that all the components in this essential are important in identifying, understanding, and utilizing the current and future risk scenarios. It showed that the essential and all the components inside it are significant in developing the disaster resilience scorecard for office building in Malaysian context.

Table 3: The Percentage Level of Importance According to the Components in Essential 2

Components	Level of Importance (%)				
	Not Important at All	Not Important	Less Important	Important	Very Important
Building manager has the access towards worst case scenario and average case scenario from reliable sources	1.7	1.7	8.3	46.7	41.7
The threat and risks analysis have considered the combined and multi hazard risks	1.7	3.3	3.3	46.7	45.0
Aware of the threat level towards the building based on pluvial or riverine flood	1.7	3.3	5.0	35.0	55.0
Aware of the possibilities for the disruption of main power supply caused by flood	1.7	3.3	5.0	35.0	55.0
Aware of the possibilities for the disruption that can affect transportation route caused by flood	1.7	1.7	5.0	36.7	55.0
Aware of the possibilities for the disruption that can affect the telephone line/communication/internet	1.7	3.3	5.0	35.0	55.0

3. Essential 3 - Enhancing Financial Capability for Resilience

There are six components in essential 3 towards enhancing the financial capability for resilience. Majority of the respondents considered all the

Siti Uzairiah Mohd Tobi, Nurul Huda binti Zakaria, Khamarrul Azahari bin Razak, Rozaimi bin Che Hassan,
Che Siti Noor Binti Koh Poh Lee @ Che Mamat, Rashdan Bin Rahmat
Disaster Resilience Scorecard for Office Building in Malaysia Towards Reducing Flood Risks

components in this essential are important in enhancing the financial capabilities for resilience. Majority of the buildings have practiced the components of this essential in their management, thus emphasizing the importance of this essential in developing the disaster resilience scorecard for office building in Malaysia.

Table 4: The Percentage Level of Importance According to the Components in Essential 3

Components	Level of Importance (%)					
	Not Important at all	Not Important	Less Important	Slightly Important	Important	Very Important
Building managers truly understand the cost to be borne if flood occurs	-	1.7	-	6.7	40.0	51.7
Having a clear financial plan required during the phase of restoring/rehabilitation after the flood	-	3.3	-	1.7	41.7	53.3
Having all sources of funding that can be used to improve the resilience of the building and planning to acquire them	1.7	1.7	3.3	5.0	53.3	35.0
The critical aspects of building maintenance were covered and allocated in the budget of the operational and maintenance costs	-	1.7	-	3.3	40.0	55.0
This building has insurance coverage for repairing and continuity cost of the organisation	-	3.3	-	6.7	35.0	55.0
Possessing the unexpected fund for the requirement of cash flow & advance payment during the loss adjustment process while waiting for the insurance claim	-	3.3	-	6.7	35.0	55.0

4. Essential 4 - Pursuing the Development of Resilient City to Achieve or Exceed the Resilience Requirements

Essential 4 consists of 5 components in pursuing the development of resilience city to achieve or exceed the resilience requirements. From the result of the survey, majority of the respondents agreed that all the components in this essential are important in achieving the resilience requirements. Conversely, the city and the local community's recovery from a disaster may depend on how effectively the ownership and management of commercial and industrial buildings in its area prepare for and respond to the disaster, and how well they cooperate with the city and each other. As majority of the respondents agreed with all the components in this essential, it will be included in the final scorecard as well.

Table 5: The Percentage Level of Importance According to the Components in Essential 4

Components	Level of Importance (%)			
	Less Important	Slightly Important	Important	Very Important
This building complies to the latest standard codes of building that can be applied to the disaster risks	1.7	3.3	43.3	51.7
This building complies to the local code regulation for the disabled (OKU) towards ensuring the safety of all building users	3.3	5	38.3	53.3
This building participated or registered with any programmes that promote the standard codes for disaster resilient building	1.7	10.0	40.0	48.3
Building manager is involved in the development of resilient building with related agencies	1.7	5.0	41.7	51.7
Building manager has the knowledge on the importance of complying with the codes & standard codes for resilient building	1.7	6.7	36.7	55.0

5. Essential 5 - Empowering Institution's Capacity for Resilience

Majority of the respondents agreed that all the six components in this essential are important in empowering the institution's capacity for resilience. It has been reflected in the current practice of the office buildings studied in this research, thus emphasising the importance of including this essential in the final scorecard.

Siti Uzairiah Mohd Tobi, Nurul Huda binti Zakaria, Khamarrul Azahari bin Razak, Rozaimi bin Che Hassan,
Che Siti Noor Binti Koh Poh Lee @ Che Mamat, Rashdan Bin Rahmat
Disaster Resilience Scorecard for Office Building in Malaysia Towards Reducing Flood Risks

Table 6: The Percentage Level of Importance According to the Components in Essential 5

Components	Level of Importance (%)				
	Not Important at All	Less Important	Slightly Important	Important	Very Important
Building manager has the skills and training to apply the risk scenario plans of the building	1.7	-	6.7	50.0	47.0
Updated building management & operational commission, and the staff were given trainings on disaster risk management	1.7	-	8.3	41.7	48.3
All critical documents/guidelines/procedures & risk plans related to the building, materials, and usage were stored in a safe and easy to access area	1.7	1.7	3.3	46.7	46.7
Building manager collected and analysed the data regularly to inform and update the disaster risk management plans	1.7	1.7	8.3	48.3	40.0
The disaster risk management plans which involved all parties were studied together with the internal stakeholder	1.7	1.7	5.0	45.0	46.7
Ensuring that knowledge transfer can take place in case of management exchange to sustain the resilient plans of the building	1.7	-	3.3	58.3	36.7
Integrating the resilience approaches including the daily operational plans & preventions	1.7	-	3.3	46.7	48.3
Every staff needs to be aware of the possible hazards in the building, be prepared to face the risks, & know how to recover from the threats	1.7	-	3.3	55.0	40.0

6. Essential 6 - Enhancing Infrastructures' Resilience
Essential 6 comprises six components in enhancing the resilience of the infrastructure of the building. Majority of the respondents considered that all the components in this essential are important to enhance the infrastructures'

resilience of the buildings. Most of the building managers are aware of all the components in this essential and included them in their current practices of the building management. Thus, indicated that this essential and its components is significant to be included in the building office resilient scorecard for Malaysia.

Table 7: The Percentage Level of Importance According to the Components in Essential 6

Components	Level of Importance (%)			
	Not Important al All	**Slightly Important**	**Important**	**Very Important**
Building managers have the reference, skills, and trainings to cooperate with the architect & contractor to adopt the resilience consideration towards building design, construction, & retrofits	-	10.0	43.3	46.7
This building has the storm-water management to reduce the damage of flood	1.7	10.0	45.0	43.3
This building has the resilience towards coastal & riverine flood	3.3	10.0	41.7	45.0
This building is designed to put up with the extreme wind conditions	3.3	10.0	36.7	50.0
This building has extra power supply and/or reserved power supply	1.7	11.7	36.7	50.0
There is emergency assistance, response equipment, transport, and related infrastructure that can be used during disaster and placed in strategic locations	1.7	8.3	38.3	51.7

7. Essential 7 - Ensuring Effective Response Towards Disaster
The last essential in the Disaster Resilience Scorecard for Office Building is essential 7 which related with ensuring the effective response towards disaster. There were eight components in this essentials, and majority of the respondents agreed that all the components are important to ensure the effective response towards disaster. This is one of the crucial elements in disaster management as the response during disaster could affect the lives and properties is not taken care effectively. Majority of the office building have adopted all the components in the essentials and are aware of the importance of those components, especially in responding to the disaster, thus emphasizing the importance of including this essential in the final scorecard.

Siti Uzairiah Mohd Tobi, Nurul Huda binti Zakaria, Khamarrul Azahari bin Razak, Rozaimi bin Che Hassan,
Che Siti Noor Binti Koh Poh Lee @ Che Mamat, Rashdan Bin Rahmat
Disaster Resilience Scorecard for Office Building in Malaysia Towards Reducing Flood Risks

Table 8: The Percentage Level of Importance According to the Components in Essential 7

Components	Level of Importance (%)			
	Not Important at All	Slightly Important	Important	Very Important
Building manager has detailed plans to face disaster – process, procedure, responsibilities, equipment, communication channel, etc.	1.7	6.7	46.7	45
Building manager received data & guidance needed from the related agencies to face disaster threats/risks and able to react during emergency & develop the emergency operational plans of the building	1.7	13.3	46.7	38.3
Building manager and related agencies have the mutual control through plans, equipment, process, and communication	1.7	3.3	53.3	41.7
Safety and emergency equipment are sufficient and complete	-	5.0	53.3	41.7
Building manager and staff can assist the first responder	1.7	8.3	48.3	41.7
Warning system (Alarms, PA system, etc) exist, functioning, and able to spread to all parts of the building	1.7	3.3	40.0	55.0
Building manager practised disaster drills regularly	-	5.0	50.0	45.0
Existing emergency communication methods can last during & after disaster to ensure communication among related parties	-	3.3	53.3	43.3

From the results, all the essentials and their components have been agreed by the respondents as significant to be included in the final scorecard for disaster resilience scorecard for office building in Malaysia.

DISCUSSION

Based on the results from the survey questionnaire, the analysis can be summarized as follows:

Table 9: Summary of Survey Questionnaire Analysis

Essential	Level of importance
Developing and Maintaining the Office Building Resilience in General	>70%
Identifying, Understanding, and utilizing the current and future risk scenarios	>70%
Enhancing Financial Capability for Resilience	>70%
Pursuing the Development of Resilient City to Achieve or Exceed the Resilience Requirements	>70%
Empowering Institution's Capacity for Resilience	>70%
Enhancing Infrastructures' Resilience	>70%
Ensuring Effective Response Towards Disaster	>70%

All the essentials and components suggested in the questionnaire are significant in developing the resilience of the office buildings. It had been agreed by more than 70% of the respondents, thus will be included in the final scorecard. The score from the scorecard can be used to evaluate the status of the building management according to the score in each component within the essentials. The measurement can be interpreted as percentage of involvement among managers and staff of the building in the components stated in the Scorecard or how far have the components have been adopted in the management of the building towards reducing the current and future risks of flood. Each score represent indication of 1 means zero preparation and 5 means perfection. The indicative measurements scale can be classified as follows:

- 5 – Single point of coordination exists with agreed roles and responsibilities
- 4 – Single point exists but with some minor exceptions
- 3 – Single points exists in principle, but with some major omissions, or lack of agreement on some major areas
- 2 – Initial steps taken to create a single point of coordination
- 1 – No single point but plans exist to create one

All the scores will be added up and the total scores will be determined. The measurement of the scorecard can be summarised as the table below:

Siti Uzairiah Mohd Tobi, Nurul Huda binti Zakaria, Khamarrul Azahari bin Razak, Rozaimi bin Che Hassan,
Che Siti Noor Binti Koh Poh Lee @ Che Mamat, Rashdan Bin Rahmat
Disaster Resilience Scorecard for Office Building in Malaysia Towards Reducing Flood Risks

Table 10: The indication of the score from the disaster resilience scorecard

	Red Zone	**Caution Zone**	**Going Well Zone**
Overall score	**25%** **(55-56)**	**26-75%** **(57-167)**	**76-100%** **(168-220)**
Building resilience	25% (6-7)	26-75% (7-18)	76-100% (19-25)
Current & future risks	25% (7-8)	26-75% (8-22)	76-100% (23-30)
Financial Capacity	25% (7-8)	26-75% (8-22)	76-100% (23-30)
Resilient city	25% (6-7)	26-75% (7-18)	76-100% (19-25)
Empowering institutional capacity	25% (9-10)	26–75% (11-30)	76-100% (31 -40)
Enhancing building resilience	25% (7-8)	26-75% (8-22)	76-100% (23-30)
Effective response	25% (10-11)	26–75% (11-30)	76-100% (31 -40)

Each section is scored at the bottom, and when all parts are done, the points will be added up from each element. Hence, the total score for this is scorecard is 220. The percentage will be determined from the total score and to get through into each element, individual score for the essentials will also be identified. From the individual score for each element, the researchers will be able to point out which essentials that needed the most attention. From there, the appropriate mitigation approaches can be suggested to improve the elements in the essentials in order to enhance the resilience of the office building.

If the overall score is the number 99 or higher, the building is likely to be extremely resilient to any disasters, but if the overall score is below the number 33, the building is much more likely to suffer greatly in a disaster or have great difficulty recovering. If the individual scores in one area tend to be much lower than in the other three, that aspect of resilience should probably be the highest priority for mitigation approach. All scores can be very useful in highlighting those aspects of resilience that needed the most attention from building owners, operators, members, leaders, and decision-makers.

From this scorecard, the current condition of the building can be assessed, and each element will be considered and the essentials with the lowest score, which indicated that they were under the worst conditions can be given more attention to. Thus, this will help the building operators and other related stakeholders to construct the appropriate mitigation approaches according to the

specific needs of the building to reduce the future risks of disaster, such as flood based on the score given in the scorecard.

CONCLUSIONS

The objective of this study is to develop a Disaster Resilience Scorecard for Office Building. This scorecard will be used to assess the current state of the office building in the areas that have been affected by flood and from the result of the scorecard, the appropriate mitigation approaches can be taken by the building management to reduce the risk of flood.

All in all, the survey questionnaire has reflected the importance of all the components in the proposed essentials towards developing The Disaster Resilience Scorecard for Office Building in Malaysia to assess the current state of the office buildings and the level of awareness in managing the building towards reducing disaster risks, specifically for flood. This scorecard will help the building managers and operators to evaluate the current state of their buildings and constructing the mitigation methods that can be adopted in facing the disaster of flood in future.

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LEGAL CONSTRUCT OF VILLAGE-OWNED SPRINGS MANAGEMENT AS A VILLAGE GOVERNMENT ASSET

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Abstract

This study aims to develop the management provisions of the springs in the Law on Water Resources. This study uses secondary data in the form of books, journals, or other legal materials. Data and information gathered were analysed. The result of the research is to build the concept of prohibition in the context of sustainable asset management based on the Villages' Sustainable Development Goals (SDGs Desa). One of the pillars of SDGs is Clean Water and Sanitation for Villages. Based on the research, the prevalence of water attractions that utilize springs creates new challenges in managing assets. One of the objectives of village-owned springs management for residents is to get clean water that is decent and can be consumed. The results of this study mainly recommend the government to formulate a policy to separate the springs from the tourist attractions. With these considerations, it is necessary to arrange regulations and provide legal certainty for central government, village government, management of water attractions, the private sector, and the society, as well as develop an incentive system for tourist attractions managers to separate the springs from tourist attraction area. tour. The results of this study can be used as references to analyse in formulating policies on springs' management to obtain decent clean water, that can be consumed for the community and is sustainable.

Keywords: springs, water attractions, Village properties, Village Assets utilization

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INTRODUCTION

Earth, water, and natural resources are controlled by the state and be used for the greatest prosperity of the society as mandated by Article 33 paragraph 3 of the 1945 Constitution. However, recently, we are facing the phenomenon of the global economic trend which is capitalistic liberal, namely through the privatization of water resources management including springs.

Springs are assets controlled by the state. Springs are not an idle asset but pose a significant problem, their presence can be identified and mapped by the central government, local governments, and village governments (Puspitarini and Akhmadi, 2019).

Recently, springs or any other water sources are commonly utilized for profit-oriented purposes. As a consequence, the surrounding society is having difficulties in accessing decent clean water to fulfil their basic needs. Society's need for clean water is not only to fulfil their basic needs such as drinking and personal hygiene but also for supporting their productive activities such as crop irrigation, milking, brick making, ice cube making, building construction, and so on (Mokgope & Butterworth, 2001 in Bhawana Upadhyay, 2005).

Conflicts between the community and right-to-manage holders also occur in rural communities. With the existence of Law Number 6 of 2014 concerning Villages as amended by Law Number 11 of 2020 concerning Job Creation, there is an increase in horizontal conflicts between village communities and Business Entities that manage tourist attractions. In addition, there are challenges between local governments and village governments regarding the management of these springs, considering that clean water is a basic human need.

The first challenge is the disharmony of regulations between Article 1 paragraph 2 and Article 2 paragraph 1 of the Law -Law Number 5 of 1960 concerning Agrarian Principles (UU P Principles of Agrarian Affairs) with Article 76 paragraph (1) in Law Number 6 of 2014 concerning Villages as amended by Law Number 11 of 2020 concerning Job Creation. Article 1 paragraph 2 of the Basic Agrarian Law states that the entire earth, water, and space, including the natural resources within the territory of the Republic of Indonesia, is a gift from God Almighty are the earth, water, and space of the Indonesian nation and constitute national wealth. This means that national wealth can only be controlled by the highest organization, namely the state. Then Article 2 paragraph 1 states that based on the provisions in Article 33 paragraph (3) of the Constitution and the matters referred to in Article 1, the earth, water, and space, including the natural resources contained therein are at the highest level. controlled by the State, as an organization of power for all the people.

However, Article 76 paragraph (1) in Law Number 6 of 2014 concerning Villages as amended by Law Number 11 of 2020 concerning Job Creation states that Village Assets can be in the form of Village treasury land, *ulayat* land, village market, animal market, boat moorings, Village buildings, fish

auctions, auctions of agricultural products, Village-owned forests, Village-owned springs, public baths, and other assets belonging to the Village. Village-owned springs should be controlled by the state, not government organizations in the form of village governments to own them. The village government only has the right to control, not to own. Thus, it is very clear that there is disharmony in the normative adjustment of Article 76 paragraph (1) in Law Number 6 of 2014 concerning Villages as amended by Law Number 11 of 2020 concerning Job Creation in the form of Village Assets, which can be in the form of springs belonging to the Village.

Secondly, there is the implementation of regulations that have not been in line. The implementation of the regulations faces 2 challenges, which are internal factors and external factors. The challenges of internal factors include the decreasing number of springs or even disappearing, the limited number of rainwater catchment areas, and the limited number of plants that can absorb water. Forest water catchment is increasingly limited due to changes in land use. The change in function, which was originally a rainwater catchment, became a tourist area and permanent buildings were built in the form of hotels, villas, and inns. This is due to the high need for tourist attractions and changes in human behaviour for travel/*healing*.

Meanwhile, the external factor is the dispute between the village community's access rights and the springs is very limited. Most of the village-owned springs are managed by business entities, whether village-owned enterprises or private enterprises. In addition to this, increasing tourist attractions in the form of reservoirs, the threat of drought due to *climate change*, increasing demand for clean water due to an increase in population, and poor environmental management.

Therefore, the authors are interested in discussing the formulation of the problem as follows:

1. How does the implementation of the management of springs in the village as a village government asset?
2. How to formulate an ideal legal norm related to village-owned springs in the Village Law?

LITERATURE BACKGROUND
A. *Cybernetic Theory according to Talcot Parson and Progressive Law*
Village Governments who work through the Village Head are not allowed to implement explicit written regulations in the form of right or wrong, this is like an automatic machine of laws and procedures, but according to the spirit and deeper meaning of the law or law in a broad sense. The village head is not only intellectually intelligent but also spiritually intelligent. In other words, the village head is carried out with full determination, empathy, dedication, and commitment

to the suffering of the village community and accompanied by the courage to find other ways than what is usually done (Satjipto Rahardjo, 2009).

The village government must exercise the authority, power, and obligation both from higher regulations and from the right of recognition while still providing a sense of justice for the village community. If the village government cannot carry out its functions properly, and correctly and causes injustice, it can cause damage to the lives of rural communities, considering that rural communities will tend to seek justice with *people's power*. However, in entering a comprehensive understanding of justice as a legal basis, including the law for managing village-owned springs.

Legality and legal legitimacy in responsive spring management must be able to explain the relationship between law and areas of social life in rural communities (Philippe Nonet, 2010) which according to Talcot Parson cannot be separated from individual actions as a meaningful behavior that is always placed in a certain social relation (Talcot Parson, 1951) which are limited by the physical and ideal environment (Satjipto Rahardjo, 2009).

In this framework, Parsons' cybernetic concept of social systems is known, which presupposes the existence of a mechanism for the continuity of social systems in rural communities. The strategy carried out by each village community needs to carry out socialization of its social system, which aims to integrate personal systems and cultural systems into the social system. In this case, the cultural system becomes the basis of the social system, then the social system becomes the basis of the individual, and then the individual system becomes the basis of the system of biological organisms (IB Wirawan, 2012). In line with this concept of cybernetics, Nasikun also suggests that the basic assumptions underlying Talcott Parsons' thinking are: (1) society should be seen as a system rather than interrelated parts; (2) the influencing relationship between the parts is dual and reciprocal; (3) although social integration can never be achieved perfectly, fundamentally the social system always tends to move towards a dynamic equilibrium in response to changes that come from outside; (4) even though dysfunction, tension, and deviation always occur, but in the long term these conditions will eventually be resolved by themselves through adjustments and the process of institutionalization. In other words, even though social integration at its perfect level will never be achieved, every social system will always proceed in that direction; (5) changes in the social system generally occur gradually, through adjustments and processes of institutionalization; (6) basically, social change arises and occurs through three kinds of possibilities: adjustments made by the social system to changes that come from outside (*extra systemic change*), growth through a process of structural and functional differentiation; and discoveries by community members; and (7) the most important factor that has the power to integrate a social system is the consensus

among community members regarding certain societal values (IB Wirawan, 2012).

Justice in the law of managing village-owned springs must reach the continuity of the social system in the communities involved in it, such as the government (central and local), farmers, households, business entities, and related stakeholders, so that the law, as a universal phenomenon but manifests itself in various ways, should be constantly structured or negotiated within a particular socio-cultural context, and thus inherently dynamic and flexible (Werner Menski, 2006). The law for the management of village-owned springs, which is inherently dynamic and flexible, is the embodiment of the state, society, and morality/ethics, as illustrated by Werner Menski in Figure 1.
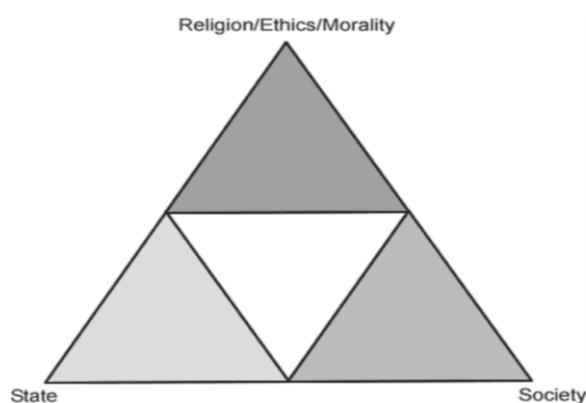
Figure 1: A Model of Legal Understanding Focusing on Plurality according to Werner Menski

The diversity of stakeholders involved in managing village-owned springs in Indonesia shows that justice-based law strongly opposes the dominance of legal centralism which has been considered to have underestimated the potential for the coexistence of various regulatory systems whose sources of law are non-state including morals/ethics, and especially rural communities and cultural elements (Werner Menski, 2006)

Progressive law is one way to build policies that are just for rural communities. According to Satjipto Rahardjo, to achieve legal goals as much as possible is built on the ability of reason and human understanding, and the concept of progress depends on human conscience and moral values of justice (Deni Nuryadi, 2016).

B. Previous Research

No.	Author Name	Theme	Differences With This Research
1.	Josina Augusthina Yvonne Wattimena	Fulfillment of the Right to Clean and Healthy Water, and the Right	The community are human rights. contains a health dimension but also an environmental dimension, which is essentially a human right
2.	Siswadi, Tukiman Taruna, Hartuti Purnaweni	Local Wisdom in Preserving Springs (Case Study in Purwogondo Village, Boja District, Kendal Regency)	A study conducted by Siswadi, Tukiman Taruna, Hartuti Purnaweni put more emphasis on local wisdom in environmental management
3	Sudarmadji, Darmakusuma Darmanto, Margaretha Widyastuti, and Sri Lestari	Spring Management for Sustainability Domestic Water Supply in the South West of Merapi Volcano Slope)	to study the management of springs based on appropriate technology for household water supply on the southern slopes of Merapi Volcano. The research was conducted by surveying and observing the field on springs used for household water supply

RESEARCH METHOD

The research method used is qualitative research. Approach method that is juridical-normative. This method is to see the reality on the ground by explaining the provisions in the legislation, then further analysing by comparing the demands of the ideal values that exist in the state constitution with the reality in Indonesia. This study uses one of the paradigms proposed by Egon G. Guba and Yvonna S. Lincoln, namely the constructivism paradigm (Erlyn Indarti, 2010 and Guba, EG, & Lincoln, Y. S, 2004).

In addition, the legal approach used in this study uses that the law is assumed to be a pattern of institutionalized social behaviour that exists as a functional and empirical social variable in social life. The approach used in this research is the statutory *approach*.

The object of this research is Ponggok Village, Polanharjo sub-district, Klaten district. The literature search with secondary data as information, both in the form of primary legal materials and secondary legal materials has been carried out in this study. Primary legal materials consist of the 1945 Constitution which has been fourth amended, the Civil Code, Law Number 5 1960 concerning Agrarian Fundamentals (Law on Agrarian Principles), Law Number 6 of 2014

concerning Villages as amended by Law Number 11 of 2020 concerning Job Creation, Law Number 17 of 2019 concerning Water Resources as amended by Law Number 11 of 2020 concerning Job Creation, Government Regulation Number 42 of 2008 concerning Management of Water Resources, Government Regulation Number 43 of 2008 concerning Groundwater and Government Regulation Number 121 of 2015 concerning Water Resources Management.

FINDINGS AND DISCUSSION

The word Construction according to the Big Indonesian Dictionary is the arrangement (model, layout) of a building (bridge, house, etc.): the house is sturdy because of reinforced concrete, the arrangement and relationship of words in a sentence or group of words, the meaning of a word is determined. by in a sentence or group of words (KBBI online, 2022). Meanwhile, construction according to *black's law dictionary* is the process, or the art, of determining the sense, real meaning, or proper explanation of obscure or ambiguous terms or provisions in a statute, written instrument, oral agreement, or the application of such subject to the case in question, by reasoning in the light derived from extraneous connected circumstances or laws or writings bearing upon the same or a connected matter, or by seeking and applying the probable aim and purpose of the provision (Henry Campbell Black, 1968).

So, the provisions in Article 76 paragraph (1) in Law Number 6 of 2014 concerning Villages as amended by Law Number 11 of 2020 concerning Job Creation which states that Village Assets can be in the form of Village treasury land, *ulayat* land, Village market, animal market, boat moorings, Village buildings, fish auctions, auctions of agricultural products, Village-owned forests, Village-owned springs, public baths, and other assets belonging to the Village need legal construction.

A. Implementation of Village Spring Resource Management as a Village Asset

Talcott Parsons explains the theory of legal cybernetics between subsystems in society from the flow of high-level information systems to low-level and vice versa (Lili Rasjidi, and Putra, IB Wyasa, 2003). Parsons further stated that law can enter into a social sub-system that regulates the integration of individual activities in meeting needs and preventing conflicts. The law is very closely related to the cultural sub-system to maintain patterns and cultural values as a guide to behaviour. In addition, the law is also close to the political subsystem which emphasizes the achievement of goals. The economic sub-system influences the political sub-system to carry out the function of adaptation to the bio-physical community environment. Thus, economic capacity can change the various existing resources to adapt various resources to sustain life (Soemantri, 2001).

Parsons believes in four functions in all sub-systems, namely: *Adaptation*, namely (economic sub-system) the function of adjustment to situation and environment, and *Goal attainment*, namely (political sub-system) the function of achieving goals or objectives. Actions must be based on shared goals in the social system concerned, *Integration*, namely (the social subsystem) the function of integrating various factors related to achieving goals, and *Latent patterns maintenance*, namely (the cultural subsystem preserving the polarization that has been formed based on the values concerned (Uthman, 2010)

Figure 2: The relationship between functions and sub-systems that exist in society

In the context of managing springs in the village, 4 subsystems influence each other. In the economic subsystem, for example, Klaten district, natural springs have decreased. This is evidenced by the fact that in 2015 Klaten district had 174 springs (BPS Kab Klaten, 2015) while in 2021 only 143 springs (jogja.tribunnews, 2021). This happens in all regions in Indonesia. The loss of these springs is influenced by 2 things, namely on the upstream side: massive mining on the slopes of the mountain, massive logging of trees in green areas, taking water using deep wells, and changing the function of land which was originally for agriculture to become a tourist spot. Meanwhile, on the downstream side, in addition to excessive exploitation of water sources, the use of water is prioritized for water tourism which brings more income than other uses. Village community access rights to meet clean water needs are hampered. This causes the villagers to build deep wells. As a result, many villagers built deep wells resulting in a decrease in the number of springs in the village and neighbouring villages.

The political subsystem is supported by various parties to generate the village original income through asset management in the village. Asset management in the village should be more important to protect the village

community from the need for clean water than to get welfare in the form of profits from village assets in the form of springs managed by both BUM Desa and Private Business Entities. Then Article 77 paragraph (2) of Law Number 6 of 2014 concerning Villages as amended by Law Number 11 of 2020 concerning Job Creation has the aim of improving the welfare and standard of living of the Village community and increasing Village income.

The reason for the village-owned spring has the meaning of "ownership" such as property rights regulated in Article 570 of the Civil Code which states that property is the right to enjoy an item more freely and to act on the item completely freely, as long as does not conflict with the law or general regulations stipulated by the competent authority and as long as it does not interfere with the rights of others, all of which does not reduce the possibility of revocation of rights in the public interest and appropriate compensation, based on statutory provisions. But on the other hand, ownership of this right is also regulated in Article 20 of the Basic Agrarian Law which states that property rights are hereditary, the strongest and fullest rights that people can have on land, keeping in mind the provisions of social functions. So that the village head cannot own the spring by enjoying an item more freely and acting on it completely freely. The social subsystem has the function of integrating individual activities in meeting needs and preventing conflicts. However, disharmony of regulations also occurs in several articles and norms, such as between Article 6 and Article 17 with Article 7 in Law Number 17 of 2019 concerning Water Resources as amended by Law Number 11 of 2020 concerning Job Creation with Article 76 paragraph (1) in Law Number 6 of 2014 concerning Villages as amended by Law Number 11 of 2020 concerning Job Creation-the states guarantees society's right to access water to fulfil daily needs, which is healthy, clean, sufficient quantity, good quality, safe, sustainable, and affordable.

The village government, which is the smallest organization in the State of Indonesia, is given the authority in Article 17 of the Water Resources Law in conjunction with the Job Creation Law which states that in accordance with the norms, standards, procedures, and criteria set by the Central Government, it has the following duties: a. assist the Central Government and/or Regional Government in managing Water Resources in the village area based on the principle of public benefit and taking into account the interests of other villages, encouraging the initiative and participation of village communities in Water Resources Management in their territory, participating in maintaining effectiveness, efficiency, quality, and orderly implementation of Water Resources Management and assisting district/city Regional Governments in meeting the daily minimum basic needs of water for villagers.

However, Article 7 of the Water Resources Law in conjunction with the Job Creation Law states that Water Resources cannot be owned and/or controlled by individuals, community groups, or business entities. This article can be

interpreted with 2 meanings, namely that the village government is not prohibited from owning water resources including springs and the village government has the authority to control village assets without any restrictions. The village government is not prohibited from owning water resources including springs because the village government is an extension of the state executive agency while the village government has the authority to control village assets without any restrictions, which is the implementation of the recognition principle and the principle of subsidiarity. The principle of recognition is an acknowledgment of the right of the origin and the principle of subsidiarity is the determination of local-scale authority and local decision-making for the benefit of the Village community.

In formulating the meaning of "controlled by the State", the Constitutional Court provides considerations in Number 3/PUU-VIII/2010 concerning the review of Law Number 27 of 2007 concerning Management of Coastal Areas and Small Islands against the 1945 Constitution of the Republic of Indonesia and the Decision of the Constitutional Court Number 001-002 - 022/PUU-I/2003 concerning the review of Law Number 20 of 2002 concerning Electricity to the 1945 Constitution of the Republic of Indonesia. Which states that the people are collectively constructed by the 1945 Constitution giving the state a mandate to make policies (*beleid*), make arrangements (*regelendaad*) , carry out management (*bestuursdaad*), conduct management (*beheersdaad*) and carry out supervision (*toezichthoudensdaad*) for the greatest prosperity of the people.

In the context *Villages' Sustainable Development Goals* (SDGs Desa) it is stated that the Village is Decent for Clean Water and Sanitation. The idea in the Village SDGs is in line with Article 28H of the 1945 Constitution which states that everyone has the right to live in physical and spiritual prosperity, to live, and have a good and healthy living environment, and the right to health services. At the international level, the World Health Organization (WHO) emphasizes the provisions of Article 11 and Article 12 of the ICESCR as follows; An inclusive right that extends not only to timely and appropriate health care but also to those factors that determine good health, These includes access to safe drinking –water and adequate sanitation, adequate supply of safe food, nutrition, and housing, healthy occupational and environmental conditions, and access to health-related education and information (World Health Organization, 2003). This WHO opinion is supported by Majda El Muhtaj who argues that water is the essence of life, without water, human beings cannot live for more than a few days. It plays a vital role in nearly every function of the body, protecting the immune system-the body's natural defense and helping remove waste matter (Majda El Muhtaj, 2008).

However, at the level of implementing the right of village communities to obtain clean water through springs, it is very difficult even though in some

villages there are programs Provision of Community-Based Drinking Water and Sanitation (PAMSIMAS). PAMSIMAS is a *platform* for rural drinking water and sanitation development even though the program already has, the village's springs have been used as tourist attractions. So that the water that will be flowed as a form of the PAMSIMAS program is not completely clean. The need for technical regulations that regulate sterile places (parent) and places that can be used (derived) for a. basic daily needs; b. people's agriculture; c. environment sanitation; d. industry; e. mining; and f. tourist. This arrangement should be carried out by the Central Government, the Ministry of Energy and Mineral Resources.

According AS (Manager of Umbul Ponggok, 2020) stated that the water tourism business such as the Ponggok banner, many parties, both neighbouring villages and villages outside Java, are interested because the income earned is very profitable. Several neighbouring villages either have their springs or use deep wells to build water tourism such as Ponggok pennant. This has caused several neighbouring villages in Indonesia to have legal problems, both administrative law, and criminal law. Therefore, the village person could be due to a lack of knowledge or disharmony of regulations. Lack of norms in Law Number 6 of 2014 concerning Villages as amended by Law Number 11 of 2020 concerning Job Creation is also one of the causes so legal construction is necessary.

The cultural subsystem, that some rural communities on the island of Java believe that the spring is identical to the holy water which is interpreted as the water of eternity. In addition, the meaning of the spring is a gift from God Almighty who gives life and blessings. The meaning of the existence of springs in the village forms a separate meaning in a village community that is local wisdom. As for the prohibitions, one of which is that the water source cannot be polluted, both physically and non-physically. Water regulation is already based on local wisdom such as subak in Bali, Susuk Sawang in Central Java, senguyun in Kalimantan and Sasi in Maluku (Siswadi, Tukiman Taruna, Purnaweni, 2011). A cultural subsystem to maintain patterns and cultural values as a guide to behavior. Parson's theory focuses on achieving *equilibrium* (balance in developed societies), of the four sub-systems. So that the spring in the village must be a point of *equilibrium* that can benefit all parties, not only the central government, local government, village government, village communities, and neighbouring village communities.

B. Formulating Ideal Legal Norms Regarding Village Owned Springs in the Village Law
In Article 76 paragraph (1) of Law Number 6 of 2014 concerning Villages as amended by Law Number 11 of 2020 concerning Job Creation which states that Village Assets can be in the form of village treasury land, *ulayat* land, village

market, animal market, boat moorings, village buildings, fish auctions, agricultural products auctions, village-owned forests, village-owned springs, public baths, and other assets belonging to the village there is a lack of norms so it is necessary to construct new norm. Between Article 76 paragraph (1) and paragraph (2), one paragraph is inserted, namely to clarify the meaning of property in Article 76 paragraph (1). The meaning of this property is not only mentioned in village-owned springs but also village-owned forest terminology.

As for the insertion of this paragraph between Article 76 paragraph (1) and paragraph (2), a new norm is proposed in paragraph (1a), namely village assets as referred to in paragraph (1), as long as it is by the Right of Recognition, Community Development, Right to Control the State, and principles of the Unitary State of the Republic of Indonesia.

This makes it clear that "ownership" is not free to exploit springs and forests in the village but performs optimal management in the context of access rights to protect village communities, both in their village and in neighbouring villages, according to the principles of kinship and mutual cooperation.

Therefore, the formulation of norms inserted in Article 76 paragraph (1) and paragraph (2) of Law Number 6 of 2014 concerning Villages as amended by Law Number 11 of 2020 concerning Job Creation provides justice values that are not only fair between managers of BUM Desa/Private Business Entities with village communities but also neighbouring village communities who require clean and good water for daily needs.

CONCLUSION

The conclusion that can be drawn from the discussion above is that from the theory of cybernetics, according to Talcott Parson, the four subsystems cause problems so that equilibrium is not achieved. So that to achieve this equilibrium, it is necessary to build a new norm in Law Number 6 of 2014 concerning Villages as amended by Law Number 11 of 2020 concerning Job Creation which provides provisions for village assets as referred to in paragraph (1), as long as they are in accordance with the Right of Recognition. , Community Development, the Right to Control the State, and the principles of the Unitary State of the Republic of Indonesia

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Undang-Undang Dasar 1945 yang telah diamandemen keempat.

Kitab Undang-Undang Hukum Perdata

Undang-Undang Nomor 5 Tahun 1960 tentang Pokok Pokok Agraria

Undang-Undang Nomor 6 Tahun 2014 tentang Desa sebagaimana diubah Undang-Undang Nomor 11 Tahun 2020 tentang Cipta Kerja

Undang-Undang Nomor 17 Tahun 2019 tentang Sumber Daya Air sebagaimana diubah Undang-Undang Nomor 11 Tahun 2020 tentang Cipta Kerja

Peraturan Pemerintah Nomor 42 Tahun 2008 tentang Pengelolaan Sumber Daya Air

Peraturan Pemerintah Nomor 43 Tahun 2008 tentang Air Tanah

Peraturan Pemerintah Nomor 121 Tahun 2015 tentang Pengusahaan Sumber Daya Air.

STRATEGY FOR RECYCLING STATE-OWNED ASSETS IN INDONESIA

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Abstract

This study aims to formulate strategies for implementing asset recycling for state property in the form of buildings owned by the Indonesian government. Ten structured interviews were conducted amongst 14 practitioners from the government and the private sector. The data were analyzed using qualitative data analysis software, NVivo 12. The results of the research are asset recycling implementation strategies in the form of considerations in implementation, mandatory steps, and implementation support strategy. Based on the research conducted, the implementation support strategy emphasizes overcoming the risk and challenge aspects in implementation. Furthermore, implementation support strategy is also formulated related to the issue of relocating the national capital city of Indonesia. The results of this study mainly recommends that the government should formulate a more flexible term of payment policy in asset recycling scheme; provide a digital information platform to entrepreneurs; carry out regulatory arrangements and provide guarantee of legal certainty for the private sector, the government itself, and the public; adopt a market-oriented state asset optimization policy paradigm; and develop an incentive system to encourage Ministries/Agencies to recycle their assets. The context of this research is limited to the study of asset recycling of state-owned buildings in general and is not simulative. The results of this study can be used as consideration and reference analysis for the government in implementing asset recycling policies with objects in the form of state-owned buildings.

Keyword: asset recycling, building, state asset, state property, implementation

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INTRODUCTION

The infrastructure funding gap encourages the government to maximize creative financing and encourage investment participation from both the public and business entities. The very high need for infrastructure development that requires funds of up to Rp 6,445 trillion cannot be fully met by the government. The government's funding capacity is only able to fund 37% of the total required investment. State-owned enterprises (BUMN) are expected to contribute to funding 21%, while the remaining 42% of funding needs from the private sector (Bappenas, 2020).

The government then made a new infrastructure funding scheme policy through Presidential Regulation Number 32 of 2020 concerning Infrastructure Financing through Limited Concession Scheme through a state-owned asset recycling scheme that allows infrastructure financing without going through loan debt. Assets that can be recycled are limited to state-owned assets or assets belonging to state-owned enterprises (BUMN), in the form of strategic infrastructure that has generated cash flow, such as toll roads, airports, and seaports (Andriansyah et al., 2017; Casady & Geddes, 2020).

The asset recycling scheme has the potential to be applied more broadly. In addition to strategic infrastructure, government buildings also have the potential to fund infrastructure development through an asset recycling scheme. Australia, Canada, and Japan have implemented asset recycling with lease schemes on their government office building assets (Chalmers et al., 2018; Patterson, 2016; Tomo, 2020). Indonesia has this potential based on several considerations. Firstly, according to the 2020 Indonesia Central Government Financial Statement, it is recorded that idle state property is worth Rp 75 billion, and as much as 55% of this value is in the form of land and buildings on it.

Secondly, the government has planned to relocate the capital city from Jakarta to East Kalimantan. Despite the relocation, the government still plans to make Jakarta a regional and global business, finance, trade, and service center area (Hutapea, 2020). The consequence of this relocation is that government buildings in Jakarta must be recycled to generate state revenue.

Thirdly, recycling state-owned buildings offers several advantages to the government. In terms of costs, asset recycling with a lease scheme will reduce the lifecycle cost maintenance incurred by the government for the recycled assets (Casady & Geddes, 2020). Then, in terms of optimizing use, handing over the management of the building to the private sector through asset recycling under a lease scheme can also maximize the potential for wider use of the building. For example, if a building from the government's point of view only functions as an office building, then from the private's point of view the building can function as an office, hospital, shopping center, to a data center.

Research on asset recycling is still rare in Indonesia. Meanwhile, this new scheme has been widely implemented abroad and is considered to be able to

take advantage of domestic and global financial markets to achieve national development goals (Nowacki et al., 2016). The researchers intend to formulate a strategy towards implementing an asset recycling scheme for state-owned buildings. This research is expected to provide a reference analysis for the government in implementing an asset recycling scheme for state-owned assets in the form of non-strategic infrastructure, that is buildings, as an alternative strategy for infrastructure financing sources.

RESEARCH BACKGROUND

Asset recycling is essentially a form of brownfield investment scheme. The difference is that the brownfield investment scheme is foreign direct investment, while asset recycling does not necessarily involve foreign investment. From Poole in Casady & Geddes (2020), the definition of asset recycling is: "[A] state government leases (for 50 to 99 years) existing infrastructure assets (airports, seaports, toll roads, electric utilities, transmission grids, etc.) to investment funds and pension funds-and uses the proceeds for new, greenfield infrastructure. Thus, the asset value that is liberated from existing infrastructure is recycled into much-needed new infrastructure. The assets that are leased are ones with healthy user-fee revenue streams, while the projects into which the proceeds are invested are ones without such revenues: transit systems, schools, other public buildings, etc."

According to Chalmers et al. (2018), asset recycling consists of two main components. First, the monetization of existing assets through sale or lease to the private sector. Second, reinvestment in new infrastructure using the proceeds received in the asset monetization.

Infrastructure asset recycling is a means of increasing investment in infrastructure, both existing and planned. The basic idea calls for a long-term leasing of aging existing facilities to well-qualified private partners and "recycling" the lease proceeds into new (but currently unfunded) infrastructure (Poole, Jr, 2018). Asset recycling allows governments to surrender future cash flows from existing projects to finance the construction of a new project (Nowacki et al., 2016).

Asset recycling offers the opportunity to provide newly needed infrastructure without increasing public debt while maintaining or potentially improving existing infrastructure service delivery (Chalmers et al., 2018). The term "public debt" mentioned by (Chalmers et al., 2018) refers to loan. In the context of asset recycling, asset recycling proceeds from advance payments received from private parties are indeed categorized as payable or obligations, because "unearned rent revenue" is included in the category of long-term debt. However, in this concept, the unearned rent revenue is passive income (Tori, 2017) that does not require the government to make payments in the future, because the debt is paid with "asset performance".

From the definition of (Chalmers et al., 2018) above, there are two asset recycling schemes, namely sale scheme and lease scheme. In the sale scheme, the government relinquishes the status of "state property" and transfers ownership to the third party. Therefore, the sale scheme is synonymous with privatization. Meanwhile, in the lease scheme, the government maintains its status of the assets, but hands over concessions on asset management to the private sector during the term of the agreement, in exchange for unearned rent revenue (rent paid in advance) or upfront payment (payment in advance).

However, several other sources such as Poole (2018), Nowacki et al. (2016) and Casady&Geddes (2020) argues that asset recycling is the term used for lease schemes, while asset recycling under sale schemes is referred to as "privatization". Asset recycling under a lease scheme is also known as the Limited Concession Scheme. While Fenn (2014) and Whiteside (2017) who are researchers from Canada categorize sale scheme as asset recycling, as well as Chalmers et al. (2018).

RESEARCH METHOD

This research is descriptive qualitative research using primary data and secondary data gathered. Primary data was obtained from the result of 10 structured interviews with 14 practitioners from the government and the private sector. Secondary data was obtained from various kinds of literature, publications, and regulations, data in the form of numbers from research results or journals, and other documents related to asset recycling schemes and their implementation on state-owned building.

Data analysis techniques consist of data collection, data reduction, data presentation, and conclusion. The tool used for data analysis is qualitative data analysis software, namely NVivo 12.

FINDINGS AND DISCUSSION
Considerations in Implementing the Asset Recycling Scheme

The things that must be considered by the government in implementing asset recycling are as follows:

1. In the asset recycling with lease scheme, the government must clarify the concession clause regarding the concession limits granted to third party whose role is as asset manager, whether the recycling is carried out in the context of the land or the building. Asset recycling in the context of the building means that third party is not allowed to change the structure or framework of the building. However, asset recycling in the context of land means that third party is allowed to change the structure and even demolish the building.
2. In the asset recycling with lease scheme, the government needs to consider the possibility of demolishing the recycled building even though the building in

question is not an old building. Considerations regarding the need for demolishing include inefficient building structures and designs that affect building productivity and unmarketable building facade designs. Demolishing will be increasingly necessary if there are any driving factors. For example, the concession period is quite long, and/or the building is in a strategic location that allows optimal productivity.

3. The government needs to consider that recycling historical assets or heritage assets is possible. Historical or heritage asset recycling is possible to be applied by refurbishing. For example, by maintaining the design of building front or exterior while rebuilding and changing the interior design to suit the function of the building.

4. The government needs to consider the asset recycling with lease scheme as either of the option for state-owned asset utilization arrangement offered to the private sector. That is, if an asset is included in the category or list of recycled assets, but there are no investors who are able or willing to operate it with asset recycling-lease scheme, the government consents the asset to be cultivated with utilization scheme other than asset recycling.

5. In the asset recycling with lease scheme, the government should consider granting a sufficiently long concession period to third party operating the asset. The term of the concession granted must be more than 10 years and can be extended.

6. The government needs to consider that the location of assets and the condition of the property market are highly considered by the private sector (investors) in assessing the prospects for state-owned buildings to be recycled. On the other hand, the private sector (investors) also depends on the utilization scheme offered by the government because it is related to the investment costs that must be provided. The upfront payment scheme could be quite a burdensome for investors and the comparison to be a resolve is the prospect of location of the state property being offered.

Mandatory Steps in Implementation

Mandatory steps must be taken by the government to be able to implement the asset recycling scheme. Firstly, the government needs to establish a policy for calculating upfront payment, which in the 2018 SPI is called property valuation with an income approach. Upfront payment in asset recycling schemes is calculated by discounting the cash flows generated from asset operations. In the upfront payment policy, the government needs to reconsider the terms of payment, especially in special conditions such as weak economic conditions and a weak property market. For example:

1. provide a grace period of 5 years until the asset operates,
2. credit payment system for 3-5 years,

3. 50% of the upfront payment is paid within 3 years, while the balance is paid within 10 years.

Secondly, government needs to appoint and authorize an "entity" to manage the asset recycling program. This entity will later run and coordinate the implementation of asset recycling, manage recycled state-owned assets, and manage fund proceeding from upfront payment (proceeds from asset recycling). Referring to the existing regulation, that is Presidential Regulation Number 32 of 2020, the entity meant is a Public Service Agency (BLU) which is under the Ministry of Finance. However, at the time the research was conducted, the BLU had not been appointed or formed.

Thirdly, the government needs to provide a legal basis for asset recycling schemes. The concept of asset recycling must be spelled out in a clear and complete statutory regulation with schemes and procedures, apropos the funding scheme, the Non-Tax State Revenue (PNBP) earmark in the budget system, the contract mechanism, and the period. Still, technical regulation and technical instruction are also required as a legal umbrella for implementation of asset recycling schemes.

Strategies to Support the Implementation of Asset Recycling
The implementation support strategy is a series of concepts and plans carried out with a long-term perspective aimed at the success of asset recycling program. The implementation support strategy focuses on overcoming the risk and challenge aspects that might be faced in implementation of the asset recycling scheme in accordance with results of the research conducted, along with crucial strategy related to the issue of relocating the capital city and the ensuing condition of government buildings post-relocation.

1. *Asset Securitization as an Alternative Method*
   - Model 1: Asset Securitization by Third Parties
     a) <u>Submissions and Transactions</u>
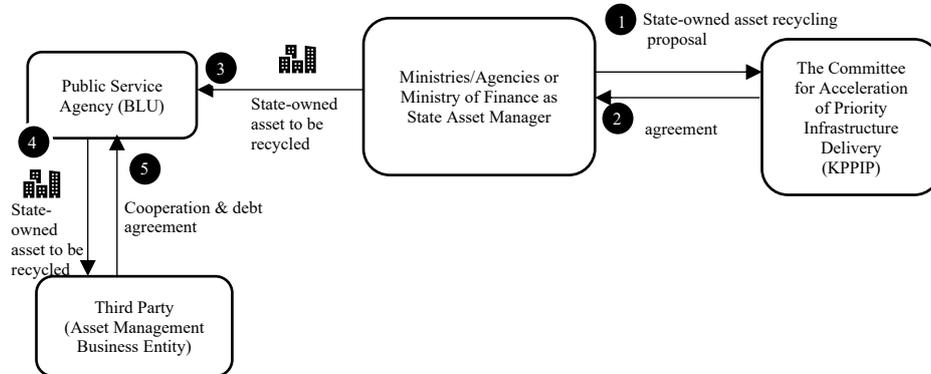
Figure 1: Submissions and transaction processes
Source: processed by researchers

b) <u>State-owned Building Management and Revenue Generating During Grace Period</u>
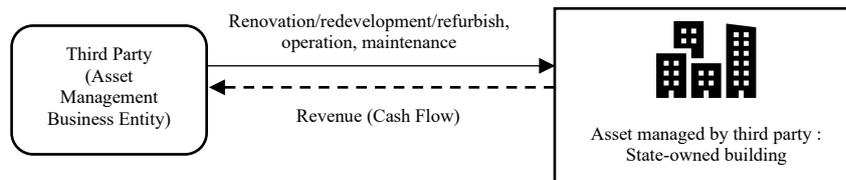
Figure 2: State-owned building management and revenue generating processes during grace period
Source: processed by researchers

c) <u>Issuance of Asset-Backed Securities and Fundraising from Investors</u>
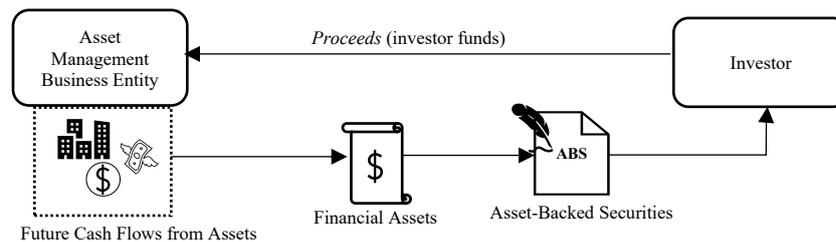
Figure 3: Process of issuance of asset-backed securities and fundraising from investors
Source: processed by researchers

d) <u>Debt Settlement of Asset Management Business Entities after the Grace Period</u>
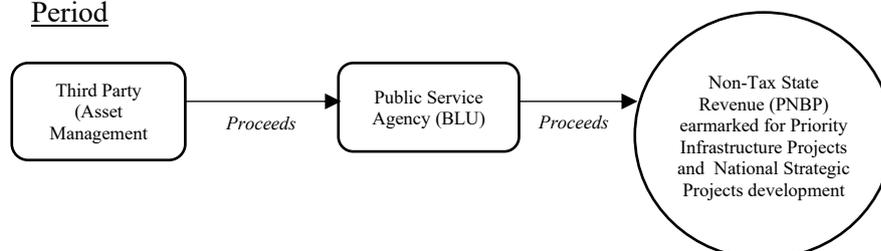
Figure 4: Debt settlement process of asset management business entities after the grace period ends
Source: processed by researchers

- Model 2: Asset Securitization by the Government
  a) <u>Submissions and Transactions</u>
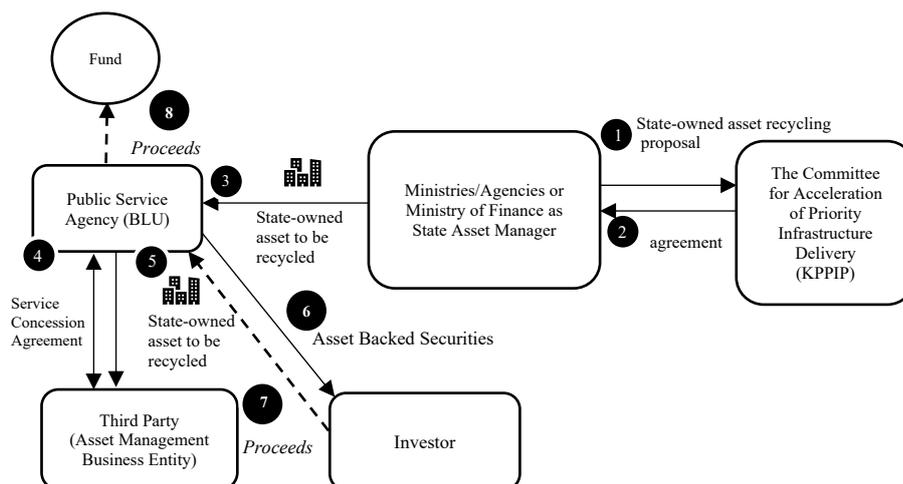
Figure 5: Submissions and transaction processes
Source: processed by researchers

b) <u>State-owned Building Management, Revenue Generating, and Return Distribution</u>
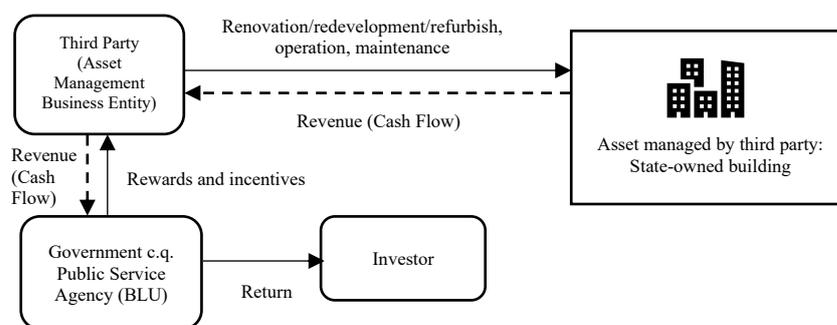
Figure 6: State-owned building management, revenue generating, and return distribution processes during grace period
Source: processed by Author

2. *Pilot Project*

   The government needs to conduct a pilot project to find the most appropriate asset recycling scheme for certain types of state-owned building and to provide reassurance to potential business partners.

3. *Management of State-Owned Asset*

   Regarding the strategy for managing state property, the key points includes: a sophisticated state-owned building database and information system; a list of state-owned buildings that have the potential to be recycled; asset mapping to identify asset which underperforms and exceeds the Goods and Requirements Standards; and reorganizing legality to ensure legal certainty over state-owned lands to prevent problems or disputes that could be detrimental in the future.

4. *A Platform to Support Asset Recycling Program*

   To support sufficient information to the public and business actors/private sector, it is necessary to have a platform to carry out state-owned assets optimization business processes digitally, especially asset recycling. For example, developing application system which front-end informs description of the asset, offer value, designation recommendation, geotagging, specific conditions of the asset, applicable methods of utilization, and restrictions prescribed.

5. *Bureaucratic Regulations and Procedures*

   In terms of laws and regulations and bureaucratic procedures, the government needs to consider synchronization of regulations, a guarantee of legal certainty, and the need for provisions in regulations regarding force majeure aimed at making asset recycling policies more investor friendly.

6. *Reporting, Accountability, and Publication*

   Public acceptance determines the success of asset recycling implementation. Therewith, transparency and accountability mechanism are needed to build public support. Therewith, publication and private sector engagement are also necessary to ensure that there will be enough private sector interest to generate competitive bids.

7. *Regulatory Dissemination and Dialogue with Business Actors*

   The need for dissemination and dialogue on regulations related to business is due to three points. Firstly, the issuance of several new laws and regulations, especially the Job Creation Law. Secondly, the government needs feedback from business actors on utilization and optimization schemes that already exist in policies or regulations. Thirdly, specifically concern asset recycling scheme of government buildings in Jakarta after capital city relocation, it is necessary to disseminate regulations regarding the new basic spatial plan that will be implemented in the Jakarta area as the old capital city in order to provide certainty that real estate entrepreneurs would be more prepared with all the prospects, then start to prepare funding.

8. *Formulation of the Paradigm of State Property Management and Systematic Dissemination*

   The Ministry of Finance, as state asset manager, should integrate its concepts and perspectives on state asset management with other institutions. Emphasized the need for a whole-of-government approach to ensure that all institution's asset managers who are asset users, from the Ministry/Agency level to the vertical unit, understand the formulated state asset management paradigm.

9. *Integration of Asset Recycling Scheme with Spatial Planning and Regional Development*

   Asset recycling schemes need to be combined with national and regional long-term spatial planning and. Firstly, regarding the relocation of the capital city, if the government plans to provide support to digital-based startup companies that are about to be based in Jakarta, then the government needs to map out which state-owned buildings would be used for the support and which ones would be optimized through utilization policies. Secondly, the availability of

adequate infrastructures and public facilities in the environment around assets that are about to be recycled is very necessary, because adequate supporting infrastructure such as road, lighting, and public access could affect the market value of the property and the tendency of investors to cultivate the property...

10. *Market Oriented Asset Optimization*
State-owned asset optimization paradigm as outlined in the legislation should allow flexibility in following market realities. The government must be able to assess the assets from the view of private sector then conduct market research to discover the condition of the real-estate market.

11. *Clarify and Synchronize Regulations on Land Rights in Relation to State Asset Optimization*
For example, if an asset is recycled and then handed over to the private sector for a period of 50 years and can be extended, what is the status of the asset? Legally, the asset belongs to the government, but the control of the asset is in the hands of the private sector who manages it.

12. *Strengthening The Position of DGSAM as State Asset Manager of Indonesia*
The Directorate General of State Assets Management (DGSAM) is expected to be more proactive, especially in formulating the culture of state asset management. To formulate that culture, DGSAM needs to coordinate with all parties, especially Ministries/Agencies as direct state-owned asset users. DGSAM plays a role in configuring perspectives, norms, rules, incentive systems, then socializing and implementing them.

13. *Granting Authority to State Asset Manager to Play an Active Role in Optimizing State-Owned Assets at Ministries/Agencies*
The crucial active role that can be given to the Ministry of Finance-DGSAM in dealing with state-owned buildings which exceeds the user's need is the authority to regulate their usage cross-ministry/agency. As a benchmark, in Australia, the Queensland state government has merged several government buildings in the City of Brisbane into one building unit. In Indonesia, Ministry of Finance is one who initiated this. The Ministry of Finance has started implementing the initiative in vertical units within it through the New Thinking of Working (NTOW) and New Ways of Working (NWOW) initiatives.

14. Incentive System for Ministries/Agencies and The Vertical Units
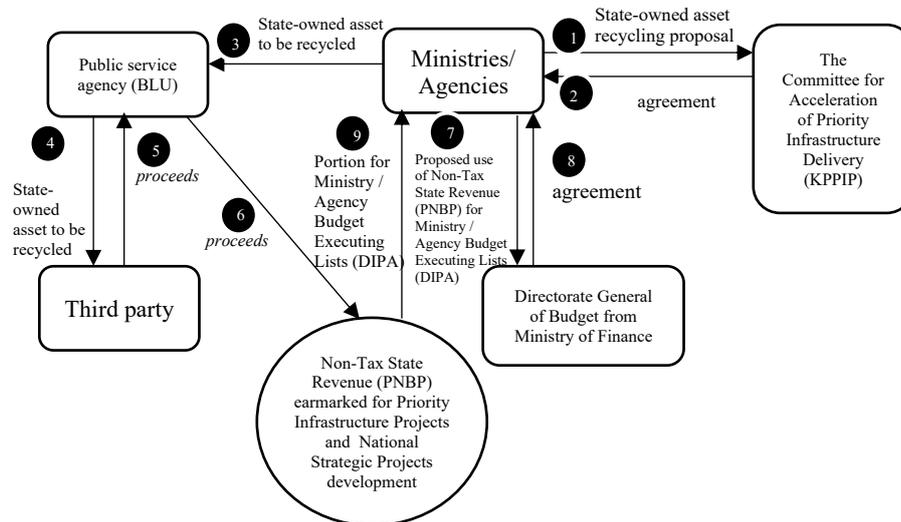
Figure 7: Monetary incentive system chart
Source: processed by researchers

CONCLUSION

For the purpose of implementing asset recycling schemes on state-owned buildings successfully, there are several considerations and steps that must be taken by the government, especially those related to the interests of the private sector and the interests of ministries/agencies as state asset users. Alongside that, there is formulated 14 supporting strategies playing a very important role and influencing the success of asset recycling for state-owned buildings implementation either directly or indirectly.

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COVID-19 STANDARD OPERATING PROCEDURE ADVANCEMENT FOR OFFICE BUILDING USING INDOOR ENVIRONMENTAL QUALITY ELEMENTS

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Abstract

COVID-19 guideline is expected to be part of the 'new norms' for workplace. However, regarding COVID-19 Standard Operating Procedure (SOP) issued by Ministry of Health Malaysia, there is inadequate concentration on Indoor Environmental Quality (IEQ) parameters even it has been proven in various research that COVID-19 transmission spread actively in indoor environment and green elements could mitigate the virus transmission. Therefore, this study aims to enhance existing COVID-19 SOP by discovering sustainable COVID-19 framework for office building. Sets of questionnaires is distributed among employees at Menara Majlis Bandaraya Johor Bahru, Malaysia and analysed using Frequency Analysis and Cross Tabulation Analysis. Overall, result shows that EQ7 Air Change Effectiveness is the most important IEQ parameters that can be selected to improve the current COVID-19 SOP. This study is significant for building manager in workplace to enhance their current SOP by adding green elements which is IEQ parameters to reduce COVID-19 spread in workplace.

Keyword: Office Building, COVID-19, Standard Operating Procedure, Indoor Environmental Quality

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INTRODUCTION

On late December 2019, the world has encountered by a new issue that caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) or namely as the Coronavirus Disease 2019 (COVID-19) which could give impact to people's health. It was discovered in Wuhan, China and has been rapidly spread to entire world (Zhou et al., 2020; Kabir et al., 2020), eventually could cause to death.

As of 18th March 2020, Malaysia reported over 700 confirmed cases which forced government to implement Movement Control Order (MCO) to reduce the COVID-19 transmission. However, the implementation of the Movement Control Order (MCO) has led to almost 50% of self-employed Malaysians have lost their jobs due MCO. According to the Labour Force Survey conducted by Department of Statistics Malaysia (DOSM) in March, it was found that 46.6% of self-employed respondents had reported losing their jobs following COVID-19 and MCO being enforced. Besides, the highest unemployment in 2020 was recorded which is achieved at 5.3%.

Due to the highest unemployment rate during MCO enforcement, government has issued a new regulation in May 2020 where include office sector started to open. However, employee is compulsory to comply with Standard Operating Procedures (SOP) issued by Ministry of Health Malaysia (MOH) where in workplace, they need to wear face mask, frequent hand washing or hand sanitiser, regular cleaning, and disinfection surface, avoid handshaking, avoid public spaces and crowds, avoid meeting in large scale size, and so forth. In spite of that, researchers from past pandemic believes that measurement control related to physical distancing, avoiding public meetings, isolating the diseased, and wearing face mask are the most successful measures to slow down the spread of pandemics (Peeri et al., 2020; Vaka et al., 2020).

Since World Health Organization (WHO) acknowledge that the coronavirus airborne transmission could be potentially indoors with crowded and poorly ventilated rooms which eventually required people to isolate themselves during lockdown, the COVID-19 SOP is expected to be part of the 'new norms' for workplace. Pertaining to the existing COVID-19 guideline, there are several researchers suggest that green measurement would also ensure the long-term environmental protection (Bashir et al., 2020; Bogoch et al., 2020) as many people spend approximate 90% of their daily life indoors.

In this crisis environment, recent researcher believes that environmental factors in buildings, including temperature, humidity, and ventilation and filtering systems by referring to indoor environmental quality criteria could leverage the gaps (Pinheiro & Luis, 2020). Dietz (2020) analysed that feature such as ventilation and indoor air quality, lighting, and the deposition on the surfaces of materials are several aspects that should be focused on in minimising the spread

of COVID-19 inside buildings. On top of that, in previous study by Chan et al., (2011) claimed that high temperature at high relative humidity have stimulating impact on coronavirus inactivation, while lower temperatures and low humidity could enable the long-term existence of the virus on contaminated surfaces. However, by reviewing to COVID-19 SOP issued by MOH, there is inadequate concentration on Indoor Environmental Quality (IEQ) parameters even it has been proven in various researches that the transmission of COVID-19 virus actively occurs indoor environment and IEQ could mitigate the virus transmission.

Mofijur et al. (2021) has mentioned that governments, policy makers, and stakeholders is required to come up with necessary steps by focusing on the future building sustainability as indoor built environment plays a critical role in our overall well-being. Hence, in order to deal with COVID-19 pandemic, matters associated with the advancement of COVID-19 SOP are taken into considerations by integrating IEQ parameters with existing COVID-19 guideline to prevent the COVID-19 spread as employee is still required to adhere to SOP and adapt a 'new norm' environment in their workplace.

Therefore, the aim of this study is to discover a sustainable COVID-19 framework for office building which not only resilient to COVID-19 threat, but also resilient towards sustainability. Three objectives are outlined in this paper to achieve this aim. The first objective is to identify IEQ parameters for office building. The second objective is to analyse the important IEQ parameters that relate to the existing COVID-19 management guideline for office building, and last but not least, the third objective is to develop a sustainable COVID-19 framework for office building.

LITERATURE REVIEW
Coronavirus Disease 2019 (COVID-19)
Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) is commonly known as COVID-19 where this virus is genetically related to SARS-CoV. Recently, COVID-19 has encountered globally and has been intensively discussed (Morawska & Cao, 2020). In accordance with that, there are various research focuses on the COVID-19 (Amoatey et al., 2020; Mehmood et al., 2020; Simon, 2020). The mode of COVID-19 transmission is also discovered where it transmitted through the air which caused by the dissemination of aerosols during sneezing or coughing (Klompas, 2022; Karia et al., 2020; Wilson et al., 2020).
In addition, WHO (2020) acknowledged that COVID-19 transmission could be transmitted in different sizes either as a droplet particle which more than 5 microns diameter, or as droplet nuclei which is less than 5 microns diameter depends on its environment and distance of infected persons. The first COVID19 case in Malaysia

was reported at the beginning of February 2020 where the person had a travel history to Singapore for an International Conference (Lodz et al., 2020).

According to Ministry of Health (MOH) Malaysia website, as of 3rd January 2021, Malaysia recorded a total of 119,077 cases from local and export cases, and 0.4% from total cases is reported to death. In addition, the worldwide cases reported for death is 2.2% from the total of 85,056,808 cases (Worldometer, 2020). It shows that the COVID-19 is a highly portable and deadly infectious disease (Gorbalenya et al., 2020), and the disease has declared as a pandemic by World Health Organization (WHO) in 2021.

This scenario eventually forced the government to enforce lockdown. Countries including Denmark, Italy, Spain Germany, China, and Europe have relied on drastic measures such as social distancing, hygiene measures, and lockdown activities to slow down the COVID-19 transmission (Petersen et al., 2020). In Malaysia, the Movement Control Order (MCO) has enforced by the government during COVID-19 outbreaks to break the transmissions. Since workplace clusters contributed 30% of Malaysia's COVID-19 cases in 2020 (The Edge Markets, 2020), this MCO enforcement has imposed lockdown orders, restricted the day-to-day activities and outdoor movement, and also closed down all non-essential business activities.

Besides, workplace clusters have emerged as a key source of COVID-19 infection in Malaysia, with hundreds of cases traced to private companies and government agencies (New Straits Times, 2021). This eventually created the highest unemployment rate in 2020 which reported at 5.3% (Department of Statistics Malaysia, 2020) and eventually triggered people's job and income.

Considering the situation of isolation resulted from the COVID-19 pandemic, employees are facing mental health problems where the anxiety and stress levels are worsening (Mercer, 2020). Furthermore, the feelings of distress, fatalism, and frustration could lead to increase blood pressure (O'Neil et al., 2020), or eventually mental worsening (Godinic et al., 2020) from isolation activities. In terms of financial matter, an additional of 2.2 million people may end up into poverty in the emerging and developing countries at the end of 2020 during COVID-19 pandemic (World Bank Group, 2020).

COVID-19 STANDARD OPERATING PROCEDURE (SOP)

In this current state, the solution of control the transmission of COVID-19 has been implemented especially within the behavioural control (Pinheiro & Luis, 2020). Most countries are currently trying to prevent the spread of COVID-19 by implementing the social distancing policies with an emphasis on the human being's health (Mofijur et al., 2021). Besides, recent researchers claimed that by closing the country boundaries could control the initial spread of COVID-19 (Chinazzi et al., 2020; Aldila et al., 2020; Beck & Hensher, 2020; Bruine de Bruin et al., 2020; de

Haas et al., 2020). In addition, researcher believes that by isolating at home could control the infection disease (de Haas et al., 2020).

In workplace, researcher from past pandemics believe that measurement control related to physical distancing, avoiding public meetings, isolating the diseased, and wearing face mask are the most successful measures to slow down the spread of pandemics (Peeri et al., 2020). According to Cirrincione et al. (2020), COVID-19 guideline is expected to be part of the 'new norms' for office, not only in the period of the pandemic, but possibly as practices that will continue to operate for long term period as precautionary measures for future disease outbreaks.

In Malaysia, COVID-19 SOP has enforced during the pandemic to minimize the transmission of COVID-19 viruses among communities such as practicing social distancing, avoiding crowded places, wearing face mask or face shield and so forth (MOH, 2020). As stated by Akyar (2012), SOP would provide a step-by-step document process which describes in detail the way that an entity should perform a given operation. Therefore, MOH Malaysia has outlined the COVID-19 SOP in workplace, as below.

Table 1: COVID-19 Standard Operating Procedure in Workplace

No.	COVID-19 Standard Operating Procedure
1.	Wear face mask or face shield
2.	Frequent hand washing/hand sanitizer
3.	Practice personal hygiene and respiratory etiquette
4.	Limit food handling and food sharing
5.	Regular cleaning and disinfection surface
6.	Avoid handshaking
7.	Using alternate communication methods such as virtual platform
8.	Practising physical distancing
9.	Avoiding public spaces, gatherings, and crowds
10.	Avoiding contact with people who could be high-risk
11.	Avoiding meeting in a large-scale size
12.	Taking temperature or thermal screening
13.	Registering contact details to ease contact tracing
14.	Consider opening windows for natural lighting and better ventilation
15.	Avoid touching eyes, nose, and mouth
16.	Relieve/Stay home if get sick/ feel unwell
17.	Avoid travelling who are in high-risk
18.	Self-isolate (14 days) who has recently visited latest COVID-19 hotspots
19.	Encourage work from home whenever possible
20.	Self-declaration on travel

Source: MOH Malaysia – Annex 25 (2020)

However, since most of the COVID-19 transmission occurs indoors environment (Nishiura et al., 2020), Morawska et al. (2020) believed that engineering controls such as increase ventilation rates, supply ventilations with portable air cleaners which is the mechanical filtration systems, and so forth in combinations with other controls such as isolation or quarantine, and social distancing could minimize the COVID-19 transmissions.

GREEN BUILDING
Green building was established in the reasons of reducing greenhouse gas emission and energy consumption significantly. It tends to practice of increasing building efficiency, reduce building impact on human health and environment, better sitting, design, construction, operation, maintenance and removal of building, and resource efficient and environmentally responsible (Urban land Institute, 2005). Besides, green building focuses on increasing the efficiency of resource use energy, water and materials while reducing building impact on human health and environment during the life cycle of the building (US Green Building Council, 2010).

Ohueri et al. (2018) claimed that several offices are adopting green building concept due to the need for resource efficiency and improved employees' output. By adopting green office building, it indirectly provides the triple-bottom line benefits of sustainable development which is environmental, economic, and social aspects (Nilashi et al., 2015). The air and water quality advancement, waste reduction, and natural resource conservation are some of the benefits of environmental aspects (CIDB, 2016). In terms of possible economic benefits, researchers believe that it includes the benefit of reduction of energy cost (Vanek & Vogel, 2007), and life cycle economic performance optimisation (Ahn, 2010). Moreover, Kaushik et al. (2020) perceived social benefits in terms of the productivity of occupants in office buildings.

INDOOR ENVIRONMENTAL QUALITY (IEQ)
Indoor Environmental Quality (IEQ) is one of key criteria in Green Building Index (GBI) assessment rating tool to meet the concept of green building towards sustainable development. As described by Omer (2008), IEQ is the perceived condition of comfort that occupants experienced physically and psychologically from their surroundings. It acts as evaluation as one of the aspects of green building rating criteria which not only focused on achieving a healthy environment for occupants, but also to environment that promotes health and productivity of the occupants. This could be supported from previous study which IEQ could has significant impact to occupants' comfort, productivity, and health in office buildings (Fisk, 2002; Collinge et al., 2014; Esfandiari et al., 2017; Kaushik et al., 2020).

Clements-Croome & Kaluarachchi (1998) emphasised that IEQ encompasses a range of environmental conditions including temperature, humidity, indoor air quality (IAQ), lighting, ventilation, noise, and crowdedness of workspace. Besides, Ravindu et al. (2015) claimed that thermal condition quality, indoor air quality, lighting quality, and acoustic quality is the parameter of IEQ. Therefore, by referring to GBI assessment criteria (2011) for nonresidential building, IEQ consists of four main assessment area and fifteen parameters involved that should be considered in assessing IEQ of a building to be recognised as a green, as below.

Table 2: Indoor Environmental Quality Elements for Non-Residential Building

Criteria	Assessment Area	Parameter
Indoor Environmental Quality	Air Quality	EQ1 Minimum IAQ Performance
		EQ2 Environmental Tobacco Smoke (ETS) Control
		EQ3 Carbon Dioxide Monitoring and Control
		EQ4 Indoor Air Pollutants
		EQ5 Mould Prevention
	Thermal Comfort	EQ6 Thermal Comfort: Controllability of Systems
		EQ7 Air Change Effectiveness
	Lighting, Visual & Acoustic Comfort	EQ8 Daylighting
		EQ9 Daylight Glare Control
		EQ10 Electric Lighting Levels
		EQ11 High Frequency Ballasts
		EQ12 External Views
		EQ13 Internal Noise Levels
		EQ14 IAQ Before/During Occupancy
	Verification	EQ15 Occupancy Comfort Survey: Verification

Source: GBI (2011)

METHODOLOGY STUDY AREA

This study mainly focuses on the green office building within the centre of Johor Bahru district which is Menara Majlis Bandaraya Johor Bahru (MBJB). A 15storey office building of Menara Majlis Bandaraya Johor Bahru that located at Bukit Senyum, Johor Bahru was completed in the year of 2019 and was certified by Green Building Index (GBI), Malaysia. Menara MBJB is chosen because of the location is located in the high population density where many office buildings is available in the centre of the city. In this study, questionnaire regarding the advancement of COVID-19 SOP for office building is focused.

DATA COLLECTION

Data are collected through two parts which is primary data and secondary data. Primary data comprises set of questionnaires which involved of the COVID-19 SOP and IEQ parameters that have been prepared to be distributed to employees who is working in the study area. Likert-scale is used in the questionnaire in order to determine the degree of importance level to express the perception of respondents. Five-degree level of importance is used which are 'Not Very Important', 'Not Important', 'Neutral', Important', 'Very Important'.

Meanwhile, the secondary data is gathered from literature review in various form such as journals, articles, thesis, conference papers, and related references book. Literature review is assessed regarding COVID-19 disease, SOP, green building, and IEQ. However, to identify the IEQ parameters and existing COVID-19 guidelines, the GBI assessment criteria for non-residential building and COVID-19 SOP for workplace enforced by MOH is obtained, respectively.

RESPONDENT SAMPLING

There are two types of sampling which are the probability sampling and nonprobability sampling. The probability sampling method for this study is used. As mentioned by Creswell (2012), individual is being selected to present the population of the groups. Therefore, to determine the advancement of COVID19 SOP in workplace, this study adopted probability sampling which is random sampling.

The targeted respondent for this study is employee who works in Menara MBJB. Therefore, the respondent of this study is assumed to have 1391 in population size which indicate the total number of employees in Menara MBJB. Therefore, the sample of this study is calculated by using Taro Yamane (Yamane, 1973) formula with 95% confidence level. The calculation formula of Taro Yamane is presented as follows:

$$n = \frac{N}{1 + N (e)_2}$$

where,

n = Sample size required
N = Number of people in the population
e = Sampling error (%)

By substituting numbers into this formula,

$$n = \frac{1391}{1 + 1391 \, (0.1)_2}$$
$$= \textbf{93}$$

After calculated the sample size by using the formula from Taro Yamane, the numbers of sample are 93 respondents. Therefore, sample size of this study confidence levels at 95% and error is ±10% due to the difficulties in collect data during pandemic era. From this research, there are 93 data of respondents is collected.

DATA ANALYSIS
There are some methods adopted to present and analysis of the data to achieve the research objectives. In this study, content analysis is used to achieve the first objective which is to identify IEQ parameters for office building. As for the expected finding for first objective, the list of IEQ parameters for office building is obtained. Besides, COVID-19 SOP issued by MOH is also obtained using content analysis method. Subsequently, literature review that has been analysed using content analysis is used to achieve the second objectives which is to analyse the important IEQ parameters that relate to the existing COVID-19 management guideline for office building. Questionnaire is then evaluated using frequency analysis to discover the important COVID-19 SOP and IEQ parameters based on employee perspectives.

In this study, frequency analysis is adopted in order to analysis the questionnaires collected from the survey. The results of frequency analysis have a percentage the highest indicates that the majority of respondents chose the preference as their priority in this study (Ahmad, 2010). Apart from that, an index is required to determine the position or degree of importance of each the importance level that has been analysed. On the other hand, the index range is obtained, and the position or degree of each importance level is determined. Therefore, this analysis is expected to gather the important existing COVID-19 guideline and IEQ parameters based on employee perspectives.

As for third objective which is to develop a sustainable COVID-19 framework for office building, the data is analysed using Cross Tabulation analysis. The highest degree of importance level will be adopted in developing sustainable COVID-19 framework for office building.

RESULT AND DISCUSSIONS IMPORTANT EXISTING COVID-19 GUIDELINE AND IEQ PARAMETER

To analyse important IEQ parameter that relate to the existing COVID-19 management guideline for office building, frequency analysis is conducted to analyse the findings.

Table 3: Mean Value and Ranking of COVID-19 SOP

COVID-19 Standard Operating Procedure	SD	Mean	Rank
Avoid contact with people who could be high-risk	**0398**		**1**
Wear face mask/face shield	**0.673**	**4.78**	**2**
Frequent hand washing/hand sanitizer	**0.439**		**3**
Relieve/Stay home if get sick/ feel unwell	**0.463**	**4.78**	**4**
Avoid public spaces, gatherings, and crowds	0.469		**5**
Avoid meeting in a large-scale size	0.469		**6**
Practice personal hygiene and respiratory etiquette	0.497		7
Avoid travelling who are in high-risk	0.523		**8**
Self-isolate (14days) who has recently visited latest	0.502	4.71	9

COVID-19 hotspots			
Practice physical distancing	0.527		10
Avoid handshaking	0.619		11
Register contact details to ease contact tracing	0.530		12
Encourage work from home whenever possible	0.641		13
Self-declaration on travel	0.569	4.62	14
Perform alternate communication methods such as virtual	0.592		15
Regular cleaning and disinfection surface	0.612		16
Limit food handling and food sharing	0.712		17
Temperature or thermal screening	0.716		18
Avoid touching eyes, nose, and mouth	0.699		19
Consider opening windows for natural lighting and better ventilation	0.766	4.31	20

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As a result, by looking into their mean value, it presents that the highest ranked for COVID-19 SOP is avoiding contact with people who could be high-risk which the mean value is 4.84. It is followed by the SOP of wearing face mask or face shield, frequent hand washing or use hand sanitiser, as well as relieve or stay home if get sick or feel unwell where their mean value is the same which are

4.78. Considering opening windows for natural lighting and better ventilation also ranked the least important to prevent the spread of COVID-19 where their mean value is 4.31. However, in order to identify the importance level based on their ranking, rescale is conducted using the index range formula as in Table 5 and Table 6 below.

Table 4: Mean Value and Ranking for IEQ Parameter

Indoor Environmental Quality Parameter	SD	Mean	Rank
EQ2 Environmental Tobacco Smoke (ETS) Control	0.469	4.77	1
EQ7 Air Change Effectiveness	0.440	4.74	2
EQ1 Minimum IAQ Performance	0.588	4.62	3
EQ5 Mould Prevention	0.599	4.55	4
EQ3 Carbon Dioxide Monitoring and Control	0.653	4.53	5
EQ8 Daylighting	0.619	4.51	6
EQ6 Thermal Comfort: Controllability of Systems	0.619	4.49	7
EQ14 IAQ Before/During Occupancy	0.648	4.42	8
EQ15 Occupancy Comfort Survey: Verification	0.679	4.41	9
EQ10 Electric Lighting Levels	0.678	4.40	10
EQ4 Indoor Air Pollutants	0.765	4.38	11
EQ12 External Views	0.659	4.31	12
EQ9 Daylight Glare Control	0.786	4.24	13
EQ13 Internal Noise Levels	0.832	4.22	14
EQ11 High Frequency Ballasts	0.822	4.10	15

As result for the IEQ parameter, it presents that the highest ranked for IEQ parameters is the EQ2 Environmental Tobacco Smoke (ETS) Control which the mean value is 4.77. It is followed by the IEQ parameters of EQ7 Air Change Effectiveness and EQ1 Minimum IAQ Performance where their mean value is 4.74 and 4.62, respectively. As mentioned before, EQ11 High Frequency Ballasts shows the least important parameter for office buildings. From this ranking, EQ11 High Frequency Ballasts also shows the least important parameter where their mean value is 4.10. However, in order to identify the importance level based on their ranking, rescale is conducted using index range formula as below.

Table 5: Index Range for COVID-19 SOP

Category of Scale	Range of Mean Value
Very Important	4.74 – 4.84
Important	4.63 – 4.73
Neutral	4.53 – 4.62
Not Important	4.42 – 4.52
Very Not Important	4.31 – 4.41

The maximum and minimum mean values for the COVID-19 SOP are 4.84 and 4.31, respectively. Therefore, the index range for COVID-19 SOP is 0.106. This indicates that there are 20 COVID-19 SOP in this study, with mean value between 4.31 to 4.84. From this, this shows that the important COVID-19 SOP in workplace is between the mean value of 4.63 to 4.84 and will be selected to develop a sustainable COVID-19 framework as an advancement for existing COVID-19 SOP. However, the mean value between 4.31 to 4.62 indicates that this range of COVID-19 SOP is not important to improve the current COVID-19 SOP in workplace.

Table 6: Index Range for IEQ Parameter

Category of Scale	Range of Mean Value
Very Important	4.65 – 4.77
Important	4.52 – 4.64
Neutral	4.38 – 4.51
Not Important	4.23 – 4.37
Very Not Important	4.10 – 4.22

As for the index range for IEQ parameter, the maximum and minimum mean values for the IEQ parameter are 4.77 and 4.10, respectively. Therefore, the index range for IEQ parameter is 0.134. This indicates that there are 15 IEQ parameters in this study, with mean value between 4.10 to 4.77. From this, this shows that the important IEQ parameter is between the mean value of 4.52 to 4.77 and will be selected to develop a sustainable COVID-19 framework as an advancement for existing COVID-19 SOP. However, the mean value between 4.10 to 4.51 indicates that this range of IEQ parameter is not important to integrate with COVID-19 SOP in order to improve the current COVID-19 SOP in workplace.

From the result above, Table 7 and Table 8 below presents the overall rescale for COVID-19 SOP and IEQ parameter according to their mean value, respectively.

Table 7: Rescale for COVID-19 SOP According to Mean Value

COVID-19 Standard Operating Procedure	Mean	Scale
Avoid contact with people who could be high-risk	4.84	Very Important
Wear face mask/face shield	4.78	Very Important
Frequent hand washing/hand sanitizer	4.78	Very Important
Relieve/Stay home if get sick/ feel unwell	4.78	Very Important
Avoid public spaces, gatherings, and crowds	4.73	Important
Avoid meeting in a large-scale size	4.73	Important
Practice personal hygiene and respiratory etiquette	4.72	Important
Avoid travelling who are in high-risk	4.71	Important
Self-isolate (14days) who has recently visited latest COVID-19 hotspots	4.71	Important
Practice physical distancing	4.70	Important
Avoid handshaking	4.65	Important
Register contact details to ease contact tracing	4.62	Neutral
Encourage work from home whenever possible	4.62	Neutral
Self-declaration on travel	4.62	Neutral
Perform alternate communication methods such as virtual platform	4.60	Neutral
Regular cleaning and disinfection surface	4.59	Neutral
Limit food handling and food sharing	4.58	Neutral
Temperature or thermal screening	4.47	Not Important
Avoid touching eyes, nose, and mouth	4.44	Not Important
Consider opening windows for natural lighting and better ventilation	4.31	Very Not Important

Table 7 presents the rescale for the COVID-19 SOP according to their range of mean value. By referring to COVID-19 SOP range of mean value for 'Very Important' which is 4.74 to 4.84, avoiding contact with people who could be high-risk, wear face mask/face shield, frequent hand washing/hand sanitizer, and relieve/Stay home if get sick/ feel unwell are located under 'Very Important' level since their mean value is in between the range of 4.74 to 4.84. Apart from that, avoid public spaces, gatherings, and crowds, avoid meeting in a large-scale size, practice personal hygiene and respiratory etiquette, avoid travelling who are in high-risk, self-isolate (14 days) who has recently visited latest COVID-19 hotspots, practice physical distancing, and avoid handshaking is recorded under 'Important' level according to their range of mean value which is in between 4.63 to 4.73. From this, the 'Very Important' and 'Important COVID-19 SOP will be selected to develop sustainable COVID-19 framework.

The COVID-19 SOP of registering contact details to ease contact tracing, encourage work from home whenever possible, self-declaration on travel, perform alternate communication methods such as virtual platform, regular cleaning and disinfection surface, and limit food handling and food sharing are recorded in between the range of 4.53 to 4.62 where it indicates their importance level of 'Neutral'. Followed by the 'Not Important' level which are temperature or thermal screening and avoid touching eyes, nose, and mouth, their range mean value is recorded in between 4.42 to 4.52. Last but not least, as for "Very Not Important' level which is considering opening windows for natural lighting and better ventilation, it is recorded in between the range of 4.31 to 4.41. From this, the "Neutral', 'Not Important', and 'Very Not Important' level are not important COVID-19 SOP as they are ranked below than mean value of 4.63.

Table 8: Rescale for IEQ Parameter According to Mean Value

Indoor Environmental Quality Parameter	Mean	Scale
EQ2 Environmental Tobacco Smoke (ETS) Control	4.77	Very Important
EQ7 Air Change Effectiveness	4.74	Very Important
EQ1 Minimum IAQ Performance	4.62	Important
EQ5 Mould Prevention	4.55	Important
EQ3 Carbon Dioxide Monitoring and Control	4.53	Important
EQ8 Daylighting	4.51	Neutral
EQ6 Thermal Comfort: Controllability of Systems	4.49	Neutral
EQ14 IAQ Before/During Occupancy	4.42	Neutral
EQ15 Occupancy Comfort Survey: Verification	4.41	Neutral
EQ10 Electric Lighting Levels	4.40	Neutral
EQ4 Indoor Air Pollutants	4.38	Neutral
EQ12 External Views	4.31	Not Important
EQ9 Daylight Glare Control	4.24	Not Important
EQ13 Internal Noise Levels	4.22	Very Not Important
EQ11 High Frequency Ballasts	4.10	Very Not Important

Table 8 presents the rescale for the IEQ parameters according to their range of mean value. By referring to IEQ parameters range of mean value for 'Very Important' which is 4.65 to 4.77, EQ2 Environmental Tobacco Smoke (ETS) Control and EQ7 Air Change Effectiveness are located under 'Very Important' level since their mean value is in between the range of 4.65 to 4.77. Apart from that, EQ1 Minimum IAQ Performance, EQ5 Mould Prevention, and EQ3 Carbon Dioxide Monitoring and Control is recorded under 'Important' level

according to their range of mean value which is in between 4.52 to 4.64. From this, the 'Very Important' and 'Important IEQ parameters will be selected to integrate with COVID-19 SOP in order to improve the current COVID-19 SOP for workplace.

The IEQ parameters of EQ8 Daylighting, EQ6 Thermal Comfort: Controllability of Systems, EQ14 IAQ Before/During Occupancy, EQ15 Occupancy Comfort Survey: Verification, EQ10 Electric Lighting Levels, EQ4 Indoor Air Pollutants are in between the range of 4.38 to 4.51 where it indicates their importance level of 'Neutral'. Followed by the 'Not Important' level which are EQ12 External Views and EQ9 Daylight Glare Control, their range mean value is in between 4.23 to 4.37. Last but not least, as for "Very Not Important' level which are EQ13 Internal Noise Levels and EQ11 High Frequency Ballasts, they are recorded in between the range of 4.10 to 4.22. From this, the "Neutral', 'Not Important', and 'Very Not Important' level are not important IEQ parameters as they are ranked below than mean value of 4.52.

SUSTAINABLE COVID-19 FRAMEWORK FOR OFFICE BUILDING

As for the third objective which is to develop sustainable COVID-19 framework for office building, the Cross Tabulation analysis is conducted regarding the important COVID-19 SOP and IEQ parameters based on the findings from second objective which is to analyse the important IEQ parameters that relate to the existing COVID-19 management guideline for office building.

As for the main purpose, important COVID-19 SOP and important IEQ parameters is selected to construct the cross-tabulation analysis in order to observe the main IEQ parameters that relate to the context of COVID-19 SOP in workplace. Thus, this analysis is conducted to examine the relationship between these two variables based on employee perspectives.

The data from respondents has been verified through the index range scale. Table 9 below presents the COVID-19 SOP and IEQ parameters are chosen based on the level of 'Important' and 'Very Important' which the range of mean value are in between 4.63 to 4.84 for COVID-19 Standard SOP and 4.52 to 4.77 for IEQ parameters. From this analysis, the data presents the total number of respondents that have chosen the 'Very Important' and 'Important' level between these two variables to access the IEQ parameters that can assist in improving the COVID-19 SOP. Most of the COVID-19 SOP and IEQ parameters that being clustered in the index range scale has higher respond from the employees.

Table 9: Cross Tabulation Between Important COVID-19 SOP and Important IEQ

IEQ PARAMETER / COVID19 SOP	EQ1 Minimum IAQ Performance	EQ2 Environmental Tobacco Smoke (ETS)	EQ3 Carbon Dioxide Monitoring	EQ5 Mould Prevention	EQ7 Air Change Effectiveness
Wear face mask or face shield	87	88	85	85	90
Frequent hand washing/hand sanitizer	89	90	86	87	92
Practice personal hygiene and respiratory etiquette	88	89	85	86	91
Avoid handshaking	84	85	81	82	86
Practice social or physical distancing	88	88	85	85	90
Avoid public spaces, gatherings, and crowds	89	90	86	87	92
Avoid contact with people who could be high-risk	89	90	86	87	92
Avoid meeting in a large-scale size	89	90	86	87	92
Relieve/Stay home if get sick/ feel unwell	88	89	85	87	91
Avoid travelling who are in highrisk	87	88	85	85	90
Self-isolate (14 days) who has recently visited latest COVID-19 hotspots	88	89	85	87	91

Based on the results, most of employee has the same option in rating the importance level of COVID-19 SOP and IEQ parameters. In other words, most of employees believe that IEQ parameters of EQ7 Air Change Effectiveness can be integrated with COVID-19 SOP to develop sustainable COVID-19 framework for office building in order to improve the existing COVID-19 management guideline in workplace. Therefore, a sustainable COVID-19

framework for office building is developed referring to the existing COVID-19 guidelines with green element which is EQ7 Air Change Effectiveness.
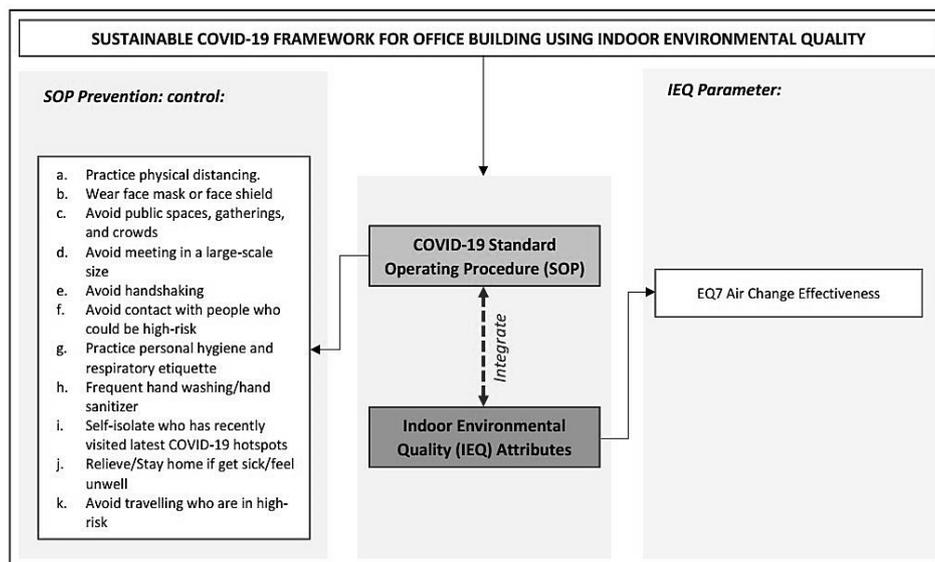
Figure 1: Sustainable COVID-19 Framework for Office Building

Since WHO acknowledge the transmission of COVID-19 virus is through airborne, thus, this result is relatable in providing the suitable COVID19 framework for office building to prevent the spread of COVID-19 whereby providing an effective clean air delivery could limit the spread of viruses since people are spend their time mostly indoors. This finding aligned with Rendana (2020). Therefore, in the context of COVID-19, EQ7 Air Change Effectiveness is the most important parameters that can be integrated with COVID-19 SOP in workplace. From this, the building manager or COVID-19 management team could use this finding as a reference or guidance in order to prevent or reduce the spread of COVID-19 in workplace from getting worst.

Nevertheless, the result from cross tabulation analysis is contributed to the outcome of this study in order to develop a sustainable COVID-19 framework for office building which not only resilient to COVID-19, but also resilient to sustainability. The data is chosen based on higher results from cross tabulation analysis between COVID-19 SOP and IEQ parameters. Therefore, the developed framework of the most highly important of IEQ parameters that can be contributed in COVID-19 SOP advancement.

CONCLUSIONS

There are eleven important COVID-19 SOP to prevent the spread of COVID-19 based on employee perspectives which are avoiding contact with people who could be high-risk, wear face mask/face shield, frequent hand washing/hand sanitizer, relieve/stay home if get sick/feel unwell, avoid public spaces, gatherings, and crowds, avoid meeting in a large-scale size, practice personal hygiene and respiratory etiquette, avoid travelling who are in high-risk, selfisolate (14days) who has recently visited latest COVID-19 hotspots, practice physical distancing, and avoid handshaking.

Meanwhile, there are five important IEQ parameters based on employee perspectives which are EQ2 Environmental Tobacco Smoke (ETS) Control, EQ7 Air Change Effectiveness, EQ1 Minimum IAQ Performance, EQ5 Mould Prevention, and EQ3 Carbon Dioxide Monitoring and Control. However, EQ7 Air Change Effectiveness presents the most important IEQ parameters that relate to the context of COVID-19 SOP to prevent COVID-19 spread.

Those results obtained could be beneficial as it could be used as guidance for COVID-19 management team in workplace in order to improve the COVID19 SOP in workplace to prevent the spread of COVID-19. By identifying and producing a framework of sustainable COVID-19 framework for office building, the building manager or COVID-19 management team in workplace is encouraged to set up a sustainable COVID-19 framework as an advancement for existing COVID-19 guideline by integrating with IEQ. However, this framework is not only resilient to COVID-19, but also resilient to sustainability and can be used as future reference in context of sustainability.

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PRIVATE LEASE APARTMENT - A BETTER POTENTIAL THROUGH BUILD-THEN-SELL APPROACH

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Abstract

Private lease apartment is considerably a new option for residential properties in Malaysia's housing market. However, its emergence is not without issue as it was claimed to bring more benefits to the land owners than to the buyers who became the properties' lessees. Therefore, the aim of this paper is twofold: to examine the disadvantages of buying an apartment through private lease, and to study the potential of the build-then-sell approach as possible solution to secure buyer's interest. Based on a case study approach, the collected primary and secondary data were descriptively analysed and discussed how the build then sell approach may potentially improve the private lease apartment delivery.

Keyword: Apartment, strata scheme, lease, build then sell

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INTRODUCTION

The development of apartments has been booming in Malaysia since 1980s, introduced in order to overcome land shortage especially in the main cities of the country such as in Kuala Lumpur and Penang (Zainudin, 2016). In the country, apartments are typically housing accommodation with strata ownership since the Strata Titles Act 1985 (Act 318) came into force on 1st June 1985 that enables a separate title to be granted for each individually owned unit in high-rise residential building like apartments. Accordingly, Act 318 has become the main legislation that regulating the buildings' subdivision process. Later, in 2007, Act 318 has been amended to also enable subdivision of land for similar strata ownership concept.

The development of high-rise residential buildings is also guided by the National Land Code (Act 828) together with other laws including the Housing Development (Control and Licensing) Act 1966 (Act 118), Town and Country Planning Act 1976 (Act 172), Street, Drainage and Building Act 1974 (Act 133), Local Government Act 1976 (Act 171) and Road Transport Act 1987; providing the rules and regulations relating with the planning, development process, properties' dealings and registration matters. Zainal et al. (2022) stated that the development process of private lease apartment has no difference with the process of developing non-private lease apartment. This is due to the fact that the private lease only exists when a lease is registered onto a strata title. Under the Torren's System that is adopted in Malaysia, one's interest in land vests and divest only upon registration and registration constitutes the final stages of any dealings (Hussin and Pardi, 2003). No interest in land will be transferred or created until the instruments affecting these dealings have been duly registered.

Even though the concept of private lease apartment or strata title leasing was first introduced in Penang in the late 1980s, the concept becomes popular in Malaysia only recently when the 'Medini private lease schemes' are built in Johor (Zainal et. al., 2002). However, Zainudin et al., (2022) in their study found that the management of private lease apartments in Medini are still under the Joint Management Body's (JMB) management period. As under Act 757, JMB is the management body established under Section 17 in the absence of the strata title. This situation put the interest of the lessees in the private lease apartments in question. Due to the fact that under the law, the interest of a lessee will only be created until the instrument affecting the lease is registered, thus this study sees that the build-then-sell (BTS) approach may become a potential solution to benefit the lessees better. Basically, BTS is a housing delivery approach that sells completed residential properties, with clear property title. Based on this concept, thus this paper aims to examine the disadvantages of buying an apartment unit through private lease and to study the potential of the BTS approach as possible solution to secure buyer's interest.

Accordingly, the primary and secondary data were collected using the case study approach. The private lease apartment that are built in Medini, Johor has been selected as the case study. Interviews were conducted with the respective officers representing both the state and federal authorities related with strata scheme development and strata title registration, officer from the Commissioner of Building (COB) office, the land owner as well as property management agent. The collected primary data were then analysed using the descriptive analysis approach. Meanwhile, secondary data were collected from various sources including from previous research reports, related acts, and the Sale & Purchase Agreement (SPA); which were then analyzed using the content analysis approach.

The presentation of this paper is organized to have three sections further. It will first discuss the advantages and disadvantages of housing delivery approaches that are practised in Malaysia. The discussion is mainly based on the analysis made to various secondary sources. Its main objective is to give the understanding as well as to elicit the advantages that the BTS may offer to safeguard house buyers' rights, focusing mainly to the importance of the strata title. This is followed by the elaboration and discussion about the private lease apartment in the chosen case study. This section resulted from data collected from secondary and primary sources. The main purpose of this section is to elaborate the mechanism used in building up the private lease apartment in the case study area and to highlight the issues brought by this kind of housing development. Finally, this paper concludes the way how the BTS may lead to the betterment of the private lease apartment delivery in Malaysia.

HOUSING DELIVERY IN MALAYSIA: THE ADVANTAGES OF THE BUILD THEN SELL APPROACH

In Malaysia, the 'build-then-sell' (BTS) housing delivery approach refers to the selling of the completed residential properties (Mohd Fauzi et.al, 2012). This delivery approach was first proposed in the country in 1981 by the The Federation of Malaysian Consumer Associations (FOMCA) as a solution to many housing delivery problems, particularly to protect the house buyers from the unscrupulous developers of the sell-then-build (STB) housing project.

The STB is a housing delivery approach that allows developers to sell houses before completion or before they are even built (Yusof, 2013), which has become a norm in Malaysia since private developers became actively involved in providing mass housing in major cities in the country (Yusof et.al., 2007).

For decades, this approach is more popular among housing developers as it allows developers to obtain money both from the house buyers and the bank before the housing project begins on site. Under this approach, buyers would refer to developer's brochure for information on house specifications and floor plans

(Yusof, 2013). Those who eventually decide to buy will initially pay 10% of the price of the house when the Sale & Purchase Agreement (SPA) is signed. The SPA is a contract to construct and deliver a house to a buyer, according to predetermined terms and conditions (Yok, 1997). The remaining 90% of the house price is payable in stages, in accordance with the progress of the construction works. Usually, the remaining 90% of the house price is funded by financial institution that providing housing loan or end-financing to house buyers. If the loan application is successful, the house buyer will start servicing the loan interest and paying the loan instalment when the financial institution starts releasing the money to the developer's development account. Yusof (2013) claims that in this sense, a developer would relatively need little capital to start a housing project. And, the success of the housing project through the STB approach would be highly depending on the credibility of developers and the certifying professionals that involved throughout the housing development process.

Unfortunately, the country's bad experience of having many abandoned housing projects during the economic recession in the 1980s and early 1990s proved that the developers have taken advantage of the STB delivery approach, which had caused the house buyers to still pay the instalment of their end-financing loan to the bank for their unfinished houses. It was reported that between 1990 and 2002, there are 80,070 house buyers became victims of abandoned housing projects which involved 544 private housing projects in the country (Ibrahim et. al, 2014).

Therefore, the BTS has been proposed by the government as an alternative of housing delivery approach alongside the STB in a way to protect the house buyers' rights. Ibrahim et.al. (2014) explains that the fundamental concept of the BTS approach is that the construction costs are borne by the housing developers which require sufficient capital to start the projects as well as depending on their own creditworthiness to apply loans from the financial institutions; and, the housing projects must be completed before the housing developers begin the selling activity. Two models of BTS were proposed by the government, as shown in the following Table 1.

Table 1: Two models of BTS Approach

100% BTS	10:90 BTS
• The selling of houses begins after the housing units have been completed and the certificate of completion and compliance (CCC) have been issued. • Buyers pay 10% of the purchase price upon signing the SPA and then pay the balance within three months. • Interested buyers could inspect houses before committing to a purchase. • Buyers can move in once payment has been settled.	• House buyers sign the SPA before houses are completed with 10% down payment. • The down payment is placed in a fidelity fund pursuant to the Legal Profession Act 1976 – the developer has no access to that fund until proper proof has been provided that a clear title for the property can be given. • The remaining 90% of the house price is payable upon completion of the house and the issuance of the CCC within 90 days.

Source: Yusof (2013)

Based on the above two models, it can be concluded that BTS approach may greatly reduce house buyers' financial burden. They do not have to worry about paying the bank loan during the construction stage or even if the project might not be completed on time. Besides, the BTS approach may enhance the developers' integrity to provide housing that is high in quality to deal with buyers' preferences in purchasing houses with the lowest defect issue.

Most importantly, the BTS approach provides greater assurance to house buyers particularly through the 10:90 BTS model. As shown in Table 1, the developer would have no access to the fidelity fund where the down payment made by buyers is placed, until a clear title is issued for the property. Property title is crucially important in a property purchase as a legal proof of property ownership. Hussin and Pardi (2003) explained that in the absence of the relevant title being issued, the SPA as provided under Schedule H of Housing Developers Act (Regulation 11(1)) together with the Deed of Mutual Covenant (DMC) is executed in lieu of Memorandum of Transfer (the Form 14A as provided under the National Land Code 1965 (Act 828)). Meanwhile, for the purpose of finance, banking legal system requires the Loan Agreement cum Assignment (LACA) to be executed in lieu of Charge Documents (the Form 16A as provided under the Act 828). Even so, Hussin and Pardi further emphasized that this process of execution of the LACA is not provided in any Statute. Therefore, the documentation depends highly on the discretion of each financial institution concerned which may cause even lengthy procedures for property ownership transfer either from the developer to the house buyer or in the sub-sale

transaction. They added that it would be more complicated when it involves strata properties that are sold without the strata title. The issues, among others are:

i) No security of ownership - A purchaser of a unit or parcel in subdivided building without the strata title would not have the rights to indefeasibility of title provided under the Act 828. Prior to the issuance of strata title, the unit owner's sole proof of ownership is only in the SPA. Therefore, the owner has only a contractual right to the property, solely based on the SPA.

ii) The welfare of the strata properties buyers depends heavily on the developer because in the absence of strata title, the developers are still the legal owners of the land on which the buildings stand. Again, the buyers' rights are not protected under the strata laws.

iii) The property ownership transfer would be lengthier because in the absence of strata titles, consent for sub-sales is always required from the developer.

iv) The property ownership transfer would be lengthier when the developer goes bankrupt because the properties would go to the Official Assignee or the Receiver. All administration matters including the application for strata titles will be under the responsibility of the Official Assignee. The consent for sub-sales of property will have to be obtained from the Official Assignee too.

v) Developers would need to hold longer responsibility to manage the strata scheme until the Management Corporation can officially be established.

The Act 318 has been amended several times since it was first enacted. The various amendments among others were aimed at further improving the procedures and the processing of applications for the subdivision of buildings and lands. Since the delay of strata titles registration and issuance has been the common issue in Malaysia, thus under the Strata Title Act (Amendment) 2013 (Act A1450), the land owner who build a strata scheme is required to deliver vacant possession to strata properties buyers together with the strata title. This amendment which came into force in the country since 1st June 2015 was made purposely to further safeguard the buyers' rights.

In Malaysia, vacant possession of a purchased residential property will be delivered to purchaser upon the completion of the property's development. The development is declared as completed when the CCC is issued by the respective authority to the developer. Under the Act A1450, the issuance of strata titles together with the delivery of vacant possession is believed to be possible especially through the provision of Section 8(1)(a) Act A1450, which stipulates

that the period within which the requirements of application for certificate of proposed strata plan (as provisioned under Section 8A(1) Act A1450) shall be complied with is:

"in the case where the sale of, or agreement to sell, any parcel of the building of the first of such sales or agreements takes place and the document that certifies the super structure stage is issued after the commencement of this Act, the period is three months from the date of issuance of the document that certifies the super structure stage".

Super structure stage refers to the stage upon the completion of building works as duly certified in accordance with the relevant by-laws make under the Street, Drainage and Building Act 1974 (Act 133). It covers the stage that when all walls that are necessary for the measurement of all parcels are completed, besides the accessory parcels and common property that are needed to be shown on the strata plan.

According to Zana et al. (2018), the latest provision on the application of strata title procedure would solve the late issuance of strata title and to prevent project abandonment by developer. The new process and procedure may possibly guarantee the title to be delivered to purchaser at the stage of vacant possession delivery; means, upon the completion of the building development. As such, it is expected that the future buyers' and owners' interest can be better protected. In fact, formation of MC can be done earlier upon the opening of strata register at the land office, which may lessen the developer's burden on the strata scheme's managerial matters.

PRIVATE LEASE APARTMENT IN THE CASE STUDY

Private lease apartment refers to a scheme of strata buildings transacted by real estate industry players in Malaysia using the private lease mechanism (Zainudin et.al., 2022). Section 221(1) Act 828 provisions the proprietor of any alienated land may grant leases of the whole or any part of it to other party. Provided that any lease that granted shall be for a term exceeding three years (Section 221(2) Act 828), the maximum terms for which any lease may be granted are as follows (Section 221(3) Act 828):

(a) 99 years if it relates to the whole of any alienated land
(b) 30 years if it relates to a part only thereof.

Nevertheless, Zainal et al. (2022) states that there was no provision under the Act 828 that precisely defining the process of strata title leasing. But, since the Act 318 is to be read and construed with Act 828; thus, registering a lease on the land title shall too be applied to the strata title. As provided under Act 828, a private lease should be registered using Form 15A (for the first private lease), and 15B for registering a sub-private lease.

And, it is also important for us to understand that, the law in Malaysia provides that the private lease is a holding of interest only, not the ownership of property as enjoyed by the state leaseholder, even though both are subject to a holding period. However, once the private lease is registered at the land office, the lessee will thereby enjoy an indefeasible interest under the law too. Section 232 of Act 828 provides that the lessee is allowed to occupy and enjoy the leased property without interference from the lessor. In addition, the lessee may also transfer the lease interest, charge, sub-lease the property with written permission from the lessor. The transfer of lease interest must be done using Form 14A of Act 828. With the transfer, the interest of any lease holder must be vested in the transferee upon the registration of the transfer of the private lease (Section 219 of Act 828).

In this sense, it seems that subdivision of building may not be needed because the ownership of land and building erected on it remain held by the land owner. But, without the building subdivision, the private lease on the apartment units will only be as a lease of part of land, so the holding period must be between three to 30 years only. In the case of apartments in Medini, the private leases of the apartment units are sold for a maximum period of up to 99 years. Accordingly, the building subdivision exercise has to be conducted so that strata title for each of the apartment unit can be issued and to enable the lease term to be given up to 99 years.

The land owner of where the private lease apartments are built in the case study area explained that the development of Medini is based on land development model using private lease mechanism. This model is selected purposely to encourage more foreign investment in that area without giving up land ownership to foreigners. Therefore, the development in Medini would only involve enjoyment of interest that not amounting to transfer of ownership. This lease interest remains until the lease term ends. Overall, there are 27 private lease apartments built in Medini. The development of these apartments started with the land owner granted private lease to property developer for 99 years. The registration of the private lease on the respective land (registration of Form 15A) has clearly given (as stipulated in the lease agreement between the land owner and the developer) the developer the right to develop the apartment and to sell the apartment units through private lease mechanism too (the lease period that will be given to the buyer is based on the remaining period of the 99 years that first

obtained by developer from the land owner). The apartments are built and delivered using the STB delivery approach. In addition, as stated in the lease agreement between the land owner and developer, the developer is required to apply for building subdivision for the strata properties to be issued with strata title each.

In the lease dealing, SPA between the developer and house buyer is signed by both parties, with consent from the land owner. At this stage, no Form 15A was registered in regards with the purchased property. All the house buyer's rights and responsibilities are listed down in the SPA. In the absence of strata title, Deed of Mutual Covenant (DMC) is also executed and signed between both parties to bind the buyer referring to matters related to the management of the strata scheme.

In the meantime, the law does not prevent the house buyer to obtain housing loan from the bank for the purchase of the property on a private lease basis. At this stage, the vacant possession of the property is handed over to the house buyer without the strata title, thus the Loan Agreement Cum Assignment is executed to replace Form 16A of Act 828.

The state authority explained that during the process of building subdivision, private lease granted to developer remains on the master title (land title). When the strata titles are registered, the lease on land will be moved to every strata title, makes the developer as lessee of each apartment unit. At the same time, land owner remains as the owner of land and all apartment units. The lease interest held by the developer will then be transferred to each house buyer through the execution of Form 14A of Act 828. So, with the transfer, the house buyer has then become the registered lessee to the said property. From the interview with the COB, we were told that none of the management of the apartments have been handed over by JMB to MC. The managerial matters are still under the responsibilities of JMB, without active involvement of land owner.

CONCLUSION
In the absence of strata title for each unit in the private lease apartment, the house buyers' interest depends solely on the SPA and DMC. The consequences are clear. The house buyer will not get the indefeasible interest under the law as the developer remains as the registered lessee to the land. It is even worse if both the SPA and DMC have gone missing. Therefore, house buyers are exposed to various risks. In fact, they have to undergo a lengthier process in sub-sale transaction.

Accordingly, these risks can potentially be avoided if the private lease apartments are delivered through the BTS approach. As mentioned, the house ownership is guaranteed under the BTS because the vacant possession of the property is delivered together with the strata title. This is due to the fact that the

property is purchased after the building is completed. The same benefit is applied in buying a private lease of completed strata property. It assures the registration of Form 15A for the respective unit. Besides, the lease interest will right away be endorsed in the strata title. By this way, the house buyers' lease interest will be better protected by the law.

ACKNOWLEDGEMENT

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SUSTAINABLE AFFORDABLE STRUCTURAL MODEL IN HOME OWNERSHIP

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Abstract

Home is a basic human need. Every year, the government is responsible for enacting a more sustainable and inclusive housing policy to ensure the adequate provision, quality and affordable housing to meet the needs of the growing sustainable communities. The aim of the current research is to analyse affordability as a mediator in the relationship between economic, social and environmental factors towards the need for home ownership among civil servants in Klang Valley. Path Analysis and Boostrapping through Structural Equation Modelling (SEM) are used to see the relationship and influence between sustainability and affordability variables. There is a significant relationship between all elements of affordability with economic, social and environmental factors. Mediation effect (mediator) for the element of affordability that is tested in the construct relationship between economic, social and environmental factors on the need for home ownership. Finally, this study succeeded in forming a sustainable affordable structural model in home ownership.

Keyword: Affordable, home ownership, sustainable

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INTRODUCTION

The human need for housing is a basic need regardless of the economic situation. Therefore, providing adequate and affordable houses for the people including those in the lower income group, which has been a priority of the Malaysian government.

The government launched the National Housing Policy (NHP) 2.0 (2018-2025) in 2019 to serve as a comprehensive guide to Malaysia's housing development involving the collaboration of both the public and private sectors, through the Ministry of Housing and Local Government (KPKT).

Although, the government faced various issues to provide affordable housing and achieve sustainable development for the housing market, the government stipulated various measures under the NHP to improve housing affordability for the low-income group, which subsequently increases the home ownership rate in Malaysia. Some of the main issues include the high prices of houses and the shortage of supply for affordable homes. Owning the desired properties in prime locations is beyond the reach of many. This is a fact, especially for first time homebuyers who face the issue of high prices of houses that are beyond their means (Rosli and Rohayu, 2022).

In relation of the issues stated above, the government took action to curb the issue of rising price of houses and helped to stabilise the property market by introducing various schemes, such as My First Home Scheme (MFHS), PR1MA and Transit Homes. These initiatives help the low-income group to own houses. Currently, there are no specific policies for the middle-income earners, who continue to face difficulty in buying houses. The high prices for houses are beyond their affordability level.

Housing affordability remains as a serious issue, with a wide range of considerations in measuring affordability. Sustainability of housing development is another major concern in the housing issues. Therefore, this study is to analyze affordability as a mediator in the relationship between economic, social and environmental factors towards the need for home ownership.

RESEARCH BACKGROUND

In recent years, Malaysia also faced with the issues of affordable housing and sustainable development like many other countries. The National Housing Policy (NHP) stipulates that everyone should own a house, either from high-income, medium-income and low-income groups regardless of social status and ethnicity. However, Malaysian finds it increasingly difficult to own a house. This is a fact especially for first time homebuyers who have been facing with high house prices that are beyond their affordable level.

People in this country are keeping a watchful eye with growing tension and anticipation on the next step that will be taken by the government and

corporation to minimise the impact of rising property price towards economic and social welfare in this country (Rosli and Rohayu, 2022).

However, current housing affordability problems are more inherent to the middle-income group of the household rather than low-income group of households because there are specific programmes directed to this low-income group by alleviating their buying power as one of the means of government initiatives, policies and measures. Housing affordability problems are alarmingly more serious and make it difficult to get home ownership specifically for the young people. A household will feel that they can afford to own a house with a level of income and spend a portion to housing expenditure, meanwhile, another household that has the same level of income may have a lower affordability level due to bigger size of household members and contribute to a high commitment for non-housing expenditure, thus, it may lead them to a shortage of income.

Housing affordability is mostly encountered within the ability of an individual or households to own and consequently implying, to pay for it. Affordability is frequently measured in terms of the ratio of housing costs to income. However, sustainability of housing development is another major concern in the housing issues. The criteria that have wide-ranging elements need to be tested in order to determine the preferred sustainable housing affordability elements. A wider measurement of housing affordability is needed by the people, instead of focusing only on the ratio between house prices and household incomes.

LITERATURE REVIEW
Housing Affordability
Housing affordability has become a main concern in major cities especially those in developing countries. While the yardstick of affordability varies by country, housing affordability is defined as the ability to own a residential property or house that fulfils basic living needs in terms of cost, quality, and location. Therefore, housing affordability is a complex issue that shall be entangled and assessed not only based on economic viability but shall include the people's wellbeing especially those in the middle and lower-income group. Regardless of any social status, citizens of any country shall be able to occupy a housing unit that meets the norm of social requirements.

Housing affordability deals with citizen's ability to pay a mortgage and use the balance of their income to purchase necessity goods or fulfil other commitments. The household members shall strike a balance between paying for housing and non-housing expenditure. According to the Central Bank of Malaysia, a house is considered affordable if its cost does not exceed 30% of an individual's gross income. The price-to-income ratio should not exceed 3.0, but from 2014 onwards, the range of the ratio is 4.0–4.4. Unsurprisingly, a 2019 report by Khazanah Research Institute asserted that houses in the country are

"seriously unaffordable". Furthermore, many households reportedly have debt levels of over 85%. Tied to their various financial commitments, most Malaysians are unable to own a home. Data from the Ministry of Finance, Malaysia showed that from 1981 to 2019, the growth of house price index is proportional to the growth of personal disposable income of the average Malaysian. However, personal disposable income grew slower than anticipated compared to house price index.

The continual increase of housing prices has dampened the housing sector and have an adverse impact on middle- and low-income earners. The Department of Statistics, Malaysia highlighted that the median monthly income of middle- and low-income earners, based on an average household size of four persons, are RM 6,275 and RM 3,000, respectively. The mean monthly income are RM 6,502 and RM 2,848, respectively. The Malaysian government consistently assures the public that it is trying to fulfil the growing demand for affordable homes that cost below RM 300,000. However, findings have shown this demand to be 48% whereas the supply only 28%. The disparity is a result of many affordable housing projects being abandoned by private developers. In analysing the main drivers of housing affordability in Malaysia, many studies are skewed towards the economic factors rather than the social and environmental factors.

Sustainability in Housing

As World Commission on Environment and Development (WCED) suggested, sustainable development concerns with 'satisfying the needs of the present without jeopardising the future generation ability to fill their needs. Recent research evidence points to the low level of awareness of the sustainable development concept (Olanrewaju, 2018). In affordable housing programs, sustainable development implies achieving a better quality of life via efficient use of resources, which ensures continued social progress while maintaining stable economic growth and environmental care (Vehbi, 2010).

Sustainable development in affordable housing sets to accomplish the following three major goals: social, environmental and economic goals. Integrating sustainability and affordability into housing often referred to as sustainable affordable housing, is housing that satisfies the demand and needs of the present generation without compromising future generations' ability to meet their housing demands and needs (Adabre, Ghazali & Chan, 2019). In general, sustainable affordable housing is housing that is designed and constructed in compliance with sustainability requirements (Ezennia, Adabre 2019) (Mulliner, 2015). Like any consumer, affordable housing buyers/renters suffer many challenges in making decisions on their choice. Affordable housing gap is widened as a result of income distribution/imbalance.

Table 1: Key Definitions of Housing Affordability

References	Focus	Definition
Howenstine E. J. (1983)	Economic	Households' ability to acquire decent accommodation by the payment of a reasonable amount of its income on shelter
Maclennan D, Williams R. (1990)	Economic	Affordability is about securing some prescribed housing standard (or different standards) at a cost (rent or price) which exerts no unreasonable burden on household incomes, according to any third party (mostly the government).
Bramley G. (1994)	Economic	The ability households to occupy housing that meets socially acceptable standards of adequacy, considering household composition (size and type) at a net cost which allows them sufficient income for survival without plunging them below some poverty standard.
Whitehead CM. (1991)	Economic	Focuses on the housing expenditure-household income relationship, and thus seek to design, a measure that can establish what amount of rent spent on the housing that is considered affordable.
Hancock KE. (1993)	Economic	Affordability is about the concept of opportunity cost of housing, what is forgone in order to secure housing and if that which is forgone is unreasonable or moderate in some sense.
Thalmann P. (2003)	Economic	Households are experiencing affordability burden, if the cost of housing displaces excessively other expenses.
Burke T., Ralston L. (2004)	Socio-economic	Affordability describes the ability of households to meet the costs of housing, while there is the possibility of maintaining other basic expenses.
Stone ME. (2006)	Socio-economic	Housing affordability is the articulation of the challenges that confront households in balancing the actual or potential housing cost, as well as the non-housing expenses, within the limits of their income.
Leishman C, Rowley S. (2012)	Socio-economic	Affordability is a broad concept that is concerned with housing appropriateness and standards, as well as social and neighbourhood issues, in addition to economic participation.
Mulliner E, Smallbone K, Maliene V. (2013) Mulliner E, Malys N, (2016)	Social, Economic & Environmental	Affordability is comprised of some broader and more sustainable perceptions of wide-ranging criteria such as economic, environmental and social aspects that affect households.
Minchenko MM, Nozdrina NN. (2017)	Social, Economic & Environmental	The housing affordability concept should receive both social and economic content, in addition to the ecological content.

Source: Ezennia, 2019

The Factors of Sustainable Affordable Housing

In this study, to identify key factors contributing to sustainable affordable housing choice, an extensive review of peer-reviewed articles in highly ranked journals was undertaken. As a result, a holistic set of factors relevant to sustainable affordable housing was identified (Table 2).

Table 2: Sustainable Housing Affordability Criteria

Sustainable Housing Affordability Criteria	Literature Review
House prices in relation to incomes	Local authority interviews; CLG (2007); Whitehead et al. (2009).
Rental costs in relation to incomes	Local authority interviews; CLG (2007); Whitehead et al. (2009).
Interest rates and mortgage availability	Local authority interviews; NHPAU (2010); Shelter (2006).
Availability of rented accommodation	Maliene and Malys (2009); ODPM (2005b); Winston (2010).
Availability of affordable home ownership products	Maliene and Malys (2009); ODPM (2005b); Winston (2010).
Quality of housing	Local authority interviews; CLG (2006a); Maliene and Malys (2009); Winston (2010).
Safety (low crime levels)	Fisher et al. (2009); ODPM (2005a; 2005b); Winston (2010).
Access to employment opportunities	Fisher et al. (2009); ODPM (2005a; 2005b); Winston (2010).
Access to and quality of transport services	CLG (2007); CTOD and CNT (2006); ODPM (2005a; 2005b); Winston (2010).
Access to and quality of schools	CLG (2007); Fisher et al. (2009); ODPM (2005a; 2005b); Samuels (2005); Zhu et al. (2005).
Access to shops (local shops, fresh produce, supermarket)	ODPM (2005a; 2005b); Samuels (2005); Zhu et al. (2005).
Access to health services (hospitals and GP's)	CLG (2007); ODPM (2005a; 2005b); Zhu et al. (2005).
Access to child care	ODPM (2005a; 2005b).
Access to leisure facilities	ODPM (2005a; 2005b).
Access to open green public space	CLG (2007); Maliene and Malys (2009); ODPM (2005a; 2005b); Winston (2010); Zhu et al. (2005).
Energy efficiency of housing	Local authority interviews; ACF and VCOSS (2008); Maliene and Malys (2009); Pullen et al. (2010); Winston (2010).
Availability of waste management facilities	Maliene and Malys (2009); ODPM (2005b); Winston (2010).

Source: Emma Mulliner et al. (2011), DRMM (2019)

Figure 1: Research framework
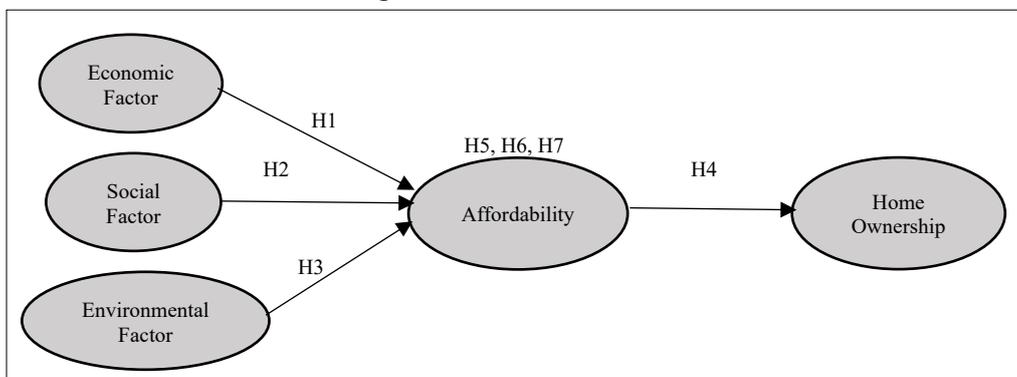
Figure 1 presents some hypothesis testing for this study involving the hypothesis of direct effects as well as the hypothesis of indirect effects or mediator effects between the constructs that will be carried out in this study. Statements for each hypothesis in Figure 1 have been made in Table 3. Each hypothesis statement in Table 3 is followed by statistical testing methods to test the hypothesis of direct effects and also indirect effects or mediators as well as the statistical methods that will be used to test each mediation hypothesis.

Table 3: Hypothesis Statement and Testing Method

	Hypothesis Statement	Statistical Test
H_1	**Economic Factors (E)** have a positive and significant influence on **Housing Affordability (A)** among civil servants	Path Analysis in SEM
H_2	**Social Factors (S)** have a positive and significant influence on **Housing Affordability (A)** among civil servants	Path Analysis in SEM
H_3	**Environmental Factors (ENV)** have a positive and significant influence on **Housing Affordability (A)** among civil servants	Path Analysis in SEM
H_4	**Housing Affordability (A)** has a positive and significant influence on **Home Ownership (HO)** among civil servants	Path Analysis in SEM
H_5	**Housing Affordability (A)** mediates the relationship between **Economic Factors (E)** and **Home Ownership (HO)** among civil servants	Path Analysis in SEM & Boostrapping
H_6	**Housing Affordability (A)** mediates the relationship between **Social Factors (S)** and **Home Ownership (HO)** among civil servants	Path Analysis in SEM & Boostrapping

	Hypothesis Statement	Statistical Test
H$_7$	**Housing Affordability (A)** mediates the relationship between **Environmental Factors (ENV)** and **Home Ownership (HO)** among civil servants	Path Analysis in SEM & Boostrapping

RESEARCH METHODOLOGY

This study is based on the quantitative method and the non-probability samples (purposive stratified sampling) approach is used for sampling. The respondents were selected based on a set of criteria: they should be civil servants, staying in the study area and working (having an income). Klang Valley was selected as the study area because it has many new housing schemes. This area is an urban conglomeration in Malaysia that is centered in the federal territories of Kuala Lumpur and Putrajaya, and includes its adjoining cities and towns in the state of Selangor. It is conterminous with Greater Kuala Lumpur, although there are variations between the two. As of year 2020, the Klang Valley is home to roughly 8 million people. The distribution of questionnaires was conducted online (using Google forms) between 1 March 2022 and 30 May 2022. Before the official distribution of the questionnaires, a pilot test was conducted with ten respondents.

Purposive sampling has been used in determining respondents who are suitable for the purpose of the study. According to Collis and Hussey (2009), if the total population is more than 75,000 and less than 1,000000, the researcher needs 382 subjects for analysis; this would be sufficient to describe the characteristics of the wider population. At the time of this study, the population of government servants in Klang Valley is unknown. Sample size for unknown population use the requirement of analysis tools. e.g., SEM need minimum 100 samples. Therefore, to avoid a very large error for small sample size estimation, the study required at least 382 respondents. the total number of responses was 380, equivalent to 99.48% of the population sample (N=382). This response rate was still acceptable since 30% was a reasonable response rate to a questionnaire survey conducted as part of a social science survey using email and mail (Sekaran, 2003). Statistical Package for Social Sciences (SPSS) and Analysis Moment of Structure (AMOS) software were used to analyze the data to model the causal relationship between several latent constructs simultaneously in a structured model. Path Analysis (Path Analysis) and Boostrapping through Structural Equation Modelling (SEM) are used to see the relationship and influence between variables.

DATA ANALYSIS AND FINDINGS

This section addresses the analysis of the survey outcomes and summarises the key findings based on the respondent profiles, Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA).

Table 4: Background of Respondents

Variables	Percentage (%)
Gender	
Male	53.6%
Female	46.4%
Age	
21-30 years old	30.4%
31-40 years old	48.2%
41-50 years old	17.9%
> 50 years old	3.5%
Race	
Malay	92.9%
Chinese	1.7%
Indian	4.1%
Others	1.3%
Marital Status	
Single	16.1%
Married	82.1%
Divorce/Widow	1.8%
Number of Children	
No Children	16.1%
One Children	8.9%
Two Children	23.2%
Three Children	19.6%
Four Children	14.3%
Five Children and above	17.9%
Household Income	
RM1,500 and below	14.3%
RM1,501-RM3,500	35.7%
RM3,501-RM5,500	37.5%
RM5,501-RM7,500	5.4%
RM7,501 and above	7.1%
Current Homeownership	
Owner	19.6%
Rent	50%
Family home/shared	30.4%
Length of Stay	
< 1 year	4.9%
1-3 years	20%
4-6 years	36.7%
7-10 years	11.7%
>10 years	26.7%
Status of Employment	
Permanent	82.1%
Contract	16.1%

Variables	Percentage (%)
Others	1.8%
Education background	
SPM/STPM/ Certificate	
Diploma	14.3%
Degree	36.9%
Master	2.4%

Before field data collection, researchers need to conduct a pilot study to re-explore instruments that have been adapted and modified to measure the constructs in this study (Bahkia et al., 2019: Rahlin et al., 2019; Muda et al., 2020; Raza & Awang, 2020, 2020a; Fitriana et al., 2022). By using data from the pilot study, the researcher has conducted an EFA (Exploratory Factor Analysis) procedure on each construct in the model. The construct and the name for each item as shown in Table 5. The findings of the EFA procedure, show that some constructs in this research model have components as presented in Figure 2. Constructs that are measured using components are called second order constructs.

Table 5: Construct and Item

Construct	Item	Name of Item
Economic Factor	E1	Household income
	E2	Household expenditure
	E3	Housing price
Social Factor	S1	Neighbourhood & social network
	S2	Lifestyle
	S3	Social Status
Environmental Factor	ENV1	Location
	ENV2	Safety (low crime levels)
	ENV3	Accessibility and transportation
	ENV4	Public facilities
	ENV5	Air and water quality
Affordability	A1	Access to employment opportunities
	A2	Access to transport services
	A3	Access to schools
	A4	Access to shops (local shops, supermarket)
	A5	Access to health services (hospital)
	A6	Access to child care
	A7	Access to leisure facilities
	A8	Access to open green public space
	A9	Energy efficiency of housing
	A10	Availability of waste management facilities

	A11	Quality of housing
Home Ownership	HO1	Physiological needs
	HO 2	Safety needs
	HO 3	Belongingness & love needs
	HO 4	Esteem needs
	HO 5	Self-actualisation needs

Figure 2: Research Framework shows the components of each construct
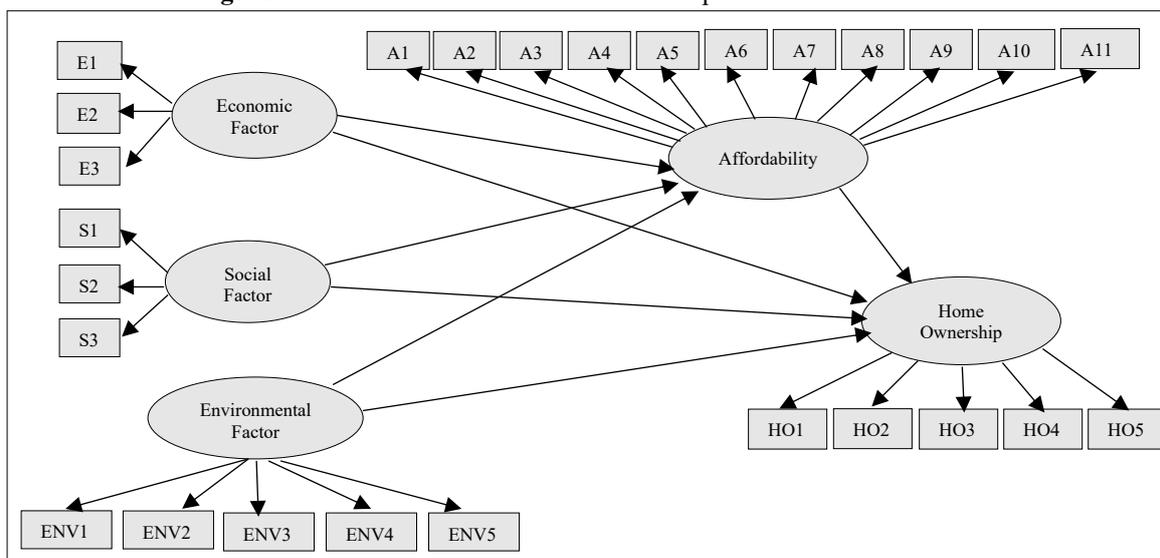
Findings from the EFA procedure show that there are several constructs in the model consisting of second order construct. According to Awang (2015), Awang et al. (2018) and Muda et al. (2018), if the research model consists of several second order constructs and the CFA procedure cannot be carried out simultaneously, then the researcher needs to conduct the CFA procedure for second order construct (Mohamad et al., 2016, 2017; Awang et al., 2018; Mahfouz et al., 2019, 2020; Sarwar et al., 2020; Bahkia et al., 2022).

Pooled-CFA Procedure for All Constructs
The main purpose is to measure the correlation value between the constructs in order to be able to assess whether the problem of multi-collinearity exists or not in the model that will be developed and estimated later. Correlation values between constructs will also be used to build a summary table of discriminant validity. CFA for pooled model is presented in Figure 3. Findings from the CFA procedure will be used to determine three types of validity and one type of reliability. The three validities are construct validity, convergent validity and

discriminant validity. The next process is to determine the composite reliability and determine the normality distribution of data set.

Figure 3: Findings from the CFA for pooled model
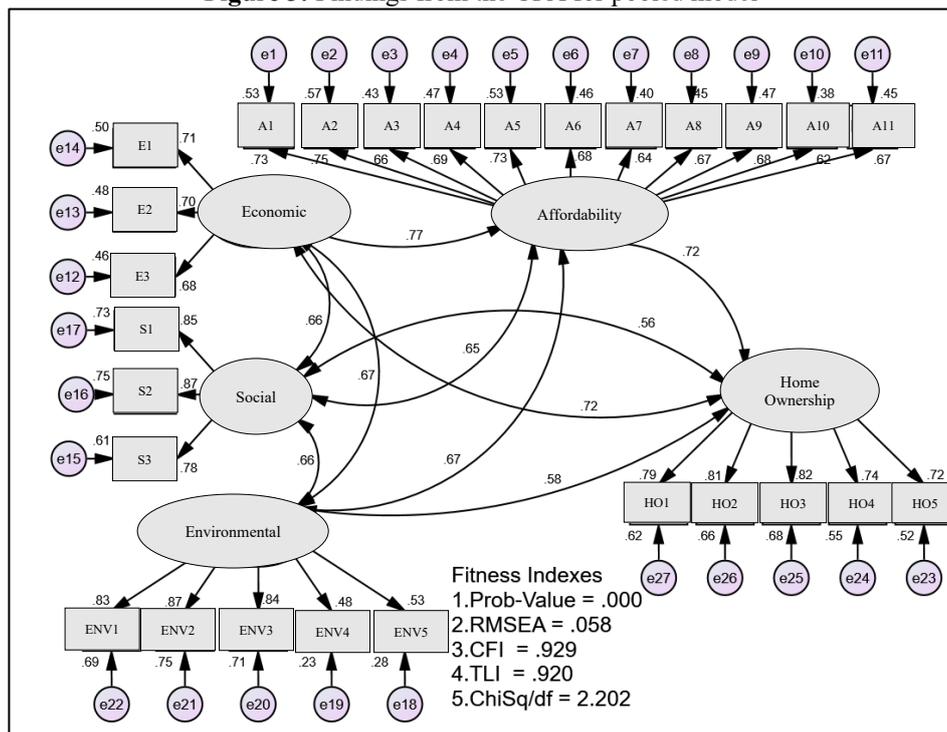
Determining Construct Validity

Construct validity can be made through examining the output value of fitness indexes for each category. There are three categories of compatibility index as presented in Table 6.

Table 6: Evaluation of Construct Validity through Compatibility Index

Name of Category	Name of Index	Index Value	Conclusion
Absolute Fit	RMSEA	0.058	The required level is reached
Incremental Fit	CFI	0.929	The required level is reached
Parsimonious Fit	Chisq/ DF	2.202	The required level is reached

Convergent Validity and Composite Reliability

Convergent Validity and Composite Reliability can be evaluated through the value of Average Variance Extracted (AVE) and the value of Composite Reliability (CR) which is calculated through the value of the weighting factor

(factor loading) as a result of the CFA procedure carried out. The values of AVE and CR values for the above construct measurement model are presented in Table 7.

Table 7: Assessment of Convergent Validity and Composite Reliability

Construct	Item	Factor Loading	CR (Above 0.6)	AVE (Above 0.45)
Economic Factor	E1	0.71	**0.739**	**0.538**
	E2	0.70		
	E3	0.68		
Social Factor	S1	0.85	**0.873**	**0.696**
	S2	0.87		
	S3	0.78		
Environmental Factor	ENV1	0.83	**0.850**	**0.544**
	ENV2	0.87		
	ENV3	0.84		
	ENV4	0.48		
	ENV5	0.58		
Affordability	A1	0.73	**0.930**	**0.552**
	A2	0.75		
	A3	0.66		
	A4	0.69		
	A5	0.73		
	A6	0.88		
	A7	0.64		
	A8	0.67		
	A9	0.88		
	A10	0.82		
	A11	0.67		
Home Ownership	HO1	0.79	**0.884**	**0.604**
	HO2	0.81		
	HO3	0.82		
	HO4	0.74		
	HO5	0.72		

Findings from Table 7 show that all AVE values (average value of extracted variance) exceed 0.45. This shows that all constructs in this research model have achieved Convergent Validity (Awang, 2014, 2015; Awang et al., 2018; Muda et al., 2018 Rahlin et al., 2019a, 2020, 2020a; Raza & Awang, 2019, 2020, 2020a; Sarwar et al., 2020; Fitriana et al., 2022).

Findings of regression coefficients between exogenous constructs against endogenous constructs as shown in Figure 4 and the findings of regression coefficients and significance values are shown in Table 8.

Figure 4: Findings from SEM analysis – Regression Model between Constructs
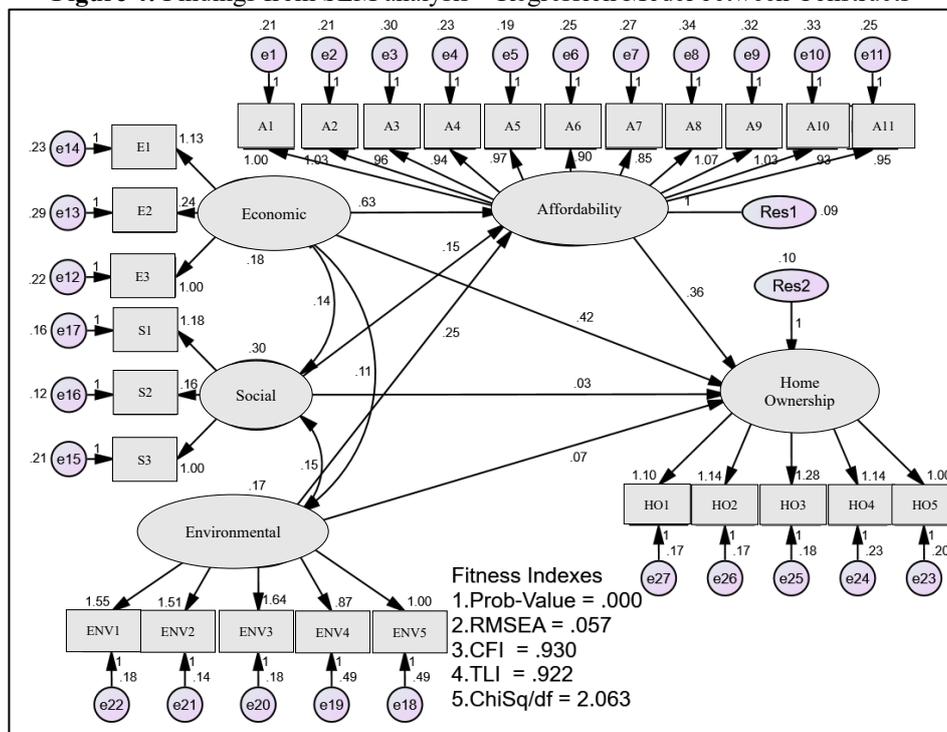
Table 8: Findings of Regression Coefficients and significance values

			Estimate	S.E.	C.R.	P	Result
Affordability	<---	Economic_Factor	.628	.111	5.662	.001	Sig
Affordability	<---	Social_Factor	.150	.065	2.306	.021	Sig
Affordability	<---	Environmental_Factor	.245	.091	2.700	.007	Sig
Home_Ownership	<---	Affordability	.355	.091	3.901	.001	Sig
Home_Ownership	<---	Economic_Factor	.419	.127	3.300	.001	Sig
Home_Ownership	<---	Social_Factor	.027	.064	.429	.668	Not Sig
Home_Ownership	<---	Environmental_Factor	.071	.087	.814	.416	Not Sig

Testing The Mediation Effect (Mediator)

The mediator hypothesis namely H5, H6 and H7 as shown in figure below. The first step is to test the hypothesis of indirect effects, which is the effect of the exogenous construct on the mediator construct, and test the hypothesis of the effect of the mediator construct on the endogenous construct. If these two hypotheses are significant, then the mediator effect from Independent Variable (IV) to Dependent Variable (DV) through the mediator exists. In other words, the

mediator function is significant. The second step is to determine the type of mediation that exists.

The next step is to verify the type of mediation that exists, whether it is a partial mediator or a full moderator. This answer can be known by testing the indirect effect from IV to DV that does not go through a mediator.

Figure 5: Mediation Effect for H5

	Mediator Hypothesis Statement
H$_5$	**Housing Affordability (A)** mediates the relationship between **Economic Factors (E)** and **Home Ownership (HO)** among civil servants

1. Direct effect a = 0.63 (Statistically significant)
2. Direct effect b = 0.36 (Statistically significant)
3. Direct effect c = 0.42 (Statistically significant)
4.   Therefore, the mediation effect occurs because both coefficients a and b are significant
5.   The type of mediation is partial mediation because the direct effect c is significant.
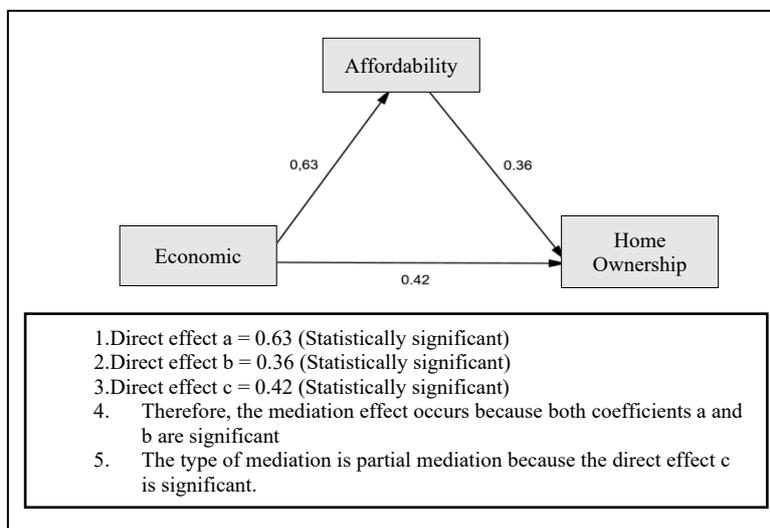
Figure 6: Mediation Effect for H6

	Mediator Hypothesis Statement
H6	**Housing Affordability (A)** mediates the relationship between **Social Factors (S)** and **Home Ownership (HO)** among civil servants
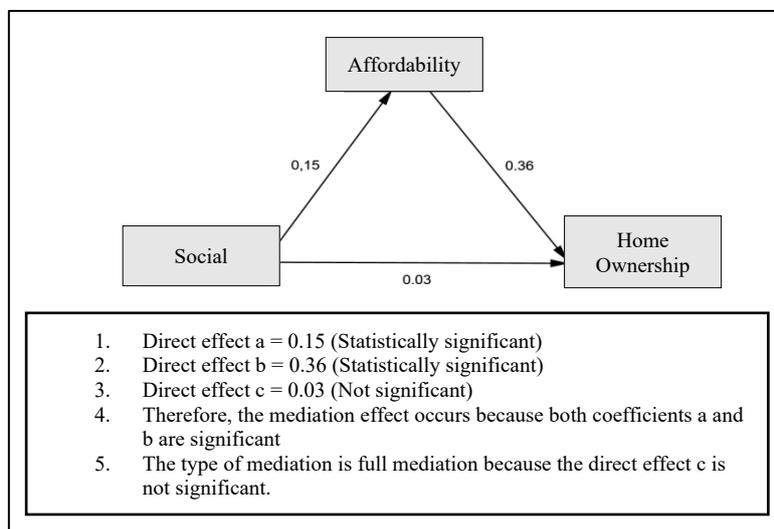
Figure 7: Mediation Effect for H7

	Mediator Hypothesis Statement
H7	**Housing Affordability (A)** mediates the relationship between **Environmental Factors (S)** and **Home Ownership (HO)** among civil servants
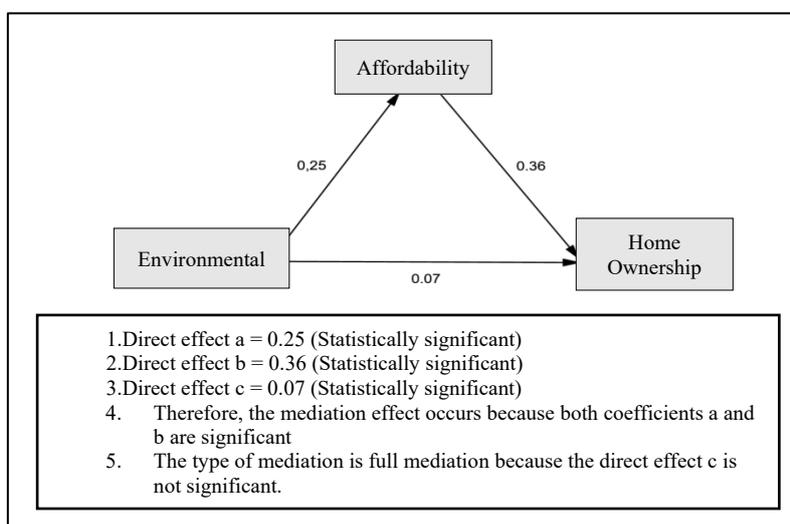
Based on the findings of the following study, the researcher can conclude that the results of the mediator test are consistent and this study shows the existence of a mediator effect which is affordability.

CONCLUSION

From all theories, this paper is proposing framework as in Figure 1 in order as guide to researchers who adopt housing affordability and housing sustainability in their research. By using the framework, all the essential criteria in sustainable and affordability are taken into consideration to proposed any home ownership model or fundamental theories in the academician studies and practical industries of research and development (R&D). This framework shall be taken further research to be exposed among the young generation in order to become one of the best approaches to be adopt by the worldwide ideas. Hopefully, the finding of this paper is managed to contribute in the housing development planning of regulation which involved Malaysian society and multi-racial community in various country.

ACKNOWLEDGEMENTS

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THE IMPACT OF HOME FINANCING COSTS AND THE BUILT ENVIRONMENT ON THE DEPRESSION LEVELS OF LOWER-INCOME EMPLOYEES WORKING FROM HOME DURING THE COVID-19 PANDEMIC (MARCH 2020 - MARCH 2021)

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Abstract

As a result of COVID-19 which was at its height between March 2020 and March 2021, the Malaysian government was forced to impose a Movement Control Order in phases to limit mobility. Consequently, many employees, including those from lower-income (B40) groups, were compelled to work from home (WFH). The movement limitations caused severe losses in income, and many had to alter the nature of their work to adapt to the WFH requirements. Concern with the mental health issues which have become a serious issue worldwide due to the increasing psychological damage caused by COVID19, this study, through questionnaire of lower income employees working from home in Penang Island, Malaysia, aims to contribute to the study of the quality of live and impact of their habit towards built environment when working from home. Data analysis is performed using SEM-PLS to examine the impact of housing cost and built environment on WFH productivity levels. This was subsequently extended to observe the influence of productivity levels on levels of depression. The results show that home financing costs and the built environment positively influenced WFH productivity levels but at the expense of higher levels of depression. The results of this study may be of interest to policy makers who need to plan mental health awareness programs due to financial worries and confined space environment for lower income group, as health culture could foster healthy equitable communities and well-being physically and mentally.

Keyword: Home financing costs, built environment, WFH, depression levels, COVID-19

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Ema Izati Zull Kepili, , Nik Hadiyan Nik Azman, Asrenee Ab Razak, Suraiyati Rahman
The Impact of Home Financing Costs and The Built Environment on The Depression Levels of Lower-Income
Employees Working from Home During the Covid-19 Pandemic (March 2020 - March 2021)

INTRODUCTION

This study refers to the time when COVID-19 cases were at their highest levels, between March 2020 and March 2021. During this period, the pandemic showed no signs of abating, with many countries facing its first, second, or third wave. Malaysia was one of the countries affected by the pandemic's third wave, with daily cases exceeding 7,000 (as of 28 May 2021). Numerous financial and social initiatives have been undertaken to combat the pandemic since its outbreak in March 2020; however, the continuous and prolonged measures have had detrimental effects on the finances and health of Malaysians.

In 2021, the number of COVID-19 cases was increasing, rising from 2,068 cases on 1 January 2021 to 8,290 on 28 May 2021. According to the Health Ministry, this happened because an excessive number of clusters were occurring in every state in Malaysia. Some of those clusters were linked to the workplace and individuals affected by the 13 new COVID-19 Variants of Concern (VOC): 12 South African variants and one Indian. Minister of Health Dr. Noor Hisham said that at least 22 cases of COVID-19 had been identified as "variants of concern."

Meanwhile, the pandemic has also had a major financial impact on B40 groups. The implementation of the Movement Control Order (MCO) by the Malaysian Government forced B40 households to cut their daily consumption levels, as well as use money and other resources carefully rather than wastefully. Families with low incomes coupled with poor financial planning have suffered considerably during the pandemic.

Financial impact of COVID-19
COVID-19 has been shown to have implications for the global economy to a catastrophic degree, and that influence has been demonstrated in financial markets worldwide. The unprecedented COVID-19 pandemic is believed to have impacted the economy and finances of many countries more widely and significantly than other temporary epidemics such as the Zika and Ebola viruses (Estrada et al., 2020). The rapid spread of COVID-19 necessitated immediate lockdowns in a number of nations, actions that halted approximately 90% of economic activity. Using the term 'stagpression', Estrada and Lee (2020 suggested a five-month lockdown period could be catastrophic for any economies that exceeded their sustainability threshold. COVID-19, it has also been suggested, has damaged the stock market and the recovery could take around a year. Wang et al., (2021) suggested that the propagation of COVID-19 has exerted a significant short-term effect on the global financial markets' stock movements. Employing two types of panel causality approaches, the empirical evidence suggested a causal relationship between COVID-19 and stock market returns in Canada, France, Germany, Italy, and the United States.

Health-related impact of COVID-19

The impact of quarantine-related stress on levels of depression and mental health is expected to be exacerbated among people with pre-existing mental illness and those with a predisposition for developing mental illness due to the possibility of recurring stressors. Unfortunately, the COVID-19 pandemic is also expected to affect people who display symptoms of, but do not meet the diagnostic criteria for, psychiatric disorders (Esterwood and Saeed, 2020). As research on previous pandemics revealed, the most frequently encountered negative psychological impacts of quarantine are post-traumatic stress symptoms, disorientation, and rage (Brooks et al., 2020). Stressors occurring during confinement were found to include fear of infection, frustration, boredom, insufficient supplies, incomplete knowledge, a loss of income, prejudice, and an escalation in confinement time. Significant impacts on depression and mental health were identified, as was the tendency to develop an unhealthy lifestyle during, as opposed to before, the confinement imposed by the COVID-19 epidemic. In particular, social and physical inactivity, an unhealthy diet, and poor sleep quality were all related to the decreased mental and emotional well-being that resulted from enforced confinement at home (i.e., depressive and dissatisfied feelings) (Ammar et al., 2021).

Financial initiatives by the Malaysian government

Malaysia issued various movement control orders (MCOs) to curb the spread of COVID-19. The country introduced MCOs of different strictness levels intended to either immediately break the COVID-19 infection chain (MCO), re-open and 'recover' the national economy in a controlled and conditional manner (Conditional MCO), gradually reopen and 'recover' the country's economic and social sectors (Recovery Conditional MCO), cease all activities in certain localities (Enhanced MCO), lock down individual residential complexes or office buildings with tighter restrictions (Targeted Enhanced MCO), or apply the MCO to specific high-risk areas but with fewer restrictions (Administrative Enhanced MCO) (Malay Mail, 2020). While the MCOs were being implemented, the Malaysian government provided many initiatives to help unfortunate citizens who had been financially affected by the pandemic. Focusing on MCO 1.0, which was implemented in March 2020, 14 initiatives were taken to assist families. Apart from giving a loan moratorium to all Malaysians for three months, there were cash stimulus packages such as 'Prihatin Nasional' aid, living cost aid, civil servant aid, pensioner's aid, e-hailing aid, low-cost rental waivers, loan deferments for six months, electricity bill savings for six months, free internet starting 1 April until the first MCO ended, a private retirement fund withdrawal scheme, and a six-month deferment of education loans.

Work From Home policy in Malaysia

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Like other countries, Malaysia also implemented a work from home policy (WFH). Based on the COVID-19 Malaysian Employees' Sentiment on Working from Home Survey, undertaken between 31 March and 6 April 2021, 84% felt that their companies were prepared for the shift to WFH. Four out of five staff were satisfied with the levels of remote engagement when working from home. Employees had an average of 2.3 virtual meetings daily. They had been keeping their WFH fun and engaging via coffee breaks, hobbies, and skills showcases, all conducted virtually. However, prolonged MCOs might have changed the euphoria of working at home into a state of depression.

Problem statement
The major issue of concern in this paper is the depression levels of low-income individuals who were working from home during the mobility control orders. This has a considerable connection with the stress levels of existing employees and the necessity for adequate employer action. The authors recognized a duality in this problem as the foundation of the research. To begin with, one area of concern is the magnitude of home financing costs and the impact of the built environment (including working space) on the productivity levels of individuals working from home. While several studies have been conducted on the association between financing costs and depression levels (Chun, 2020; Bentley et al., 2011), none examined whether the built environment of low-income workers had any substantial effects on working productivity. The second area of concern is the connection between the productivity levels of those working at home and levels of depression. Although several studies have been conducted on the relationship between productivity levels and mental health (Johnston et al., 2019 and Hünefeld, et al., 2020), they have not considered the low-income demography or the worldwide pandemic as the study setting, hence the knowledge gap in this topic.

This research aims to examine the impact of home financing costs and the built environment on WFH productivity levels, consequently exploring how the latter affected the depression levels of employees working from home during the COVID-19 pandemic. Therefore, the main objectives of this study are twofold: i) to determine the impact of home financing costs and the built environment on WFH productivity levels and ii) to determine the impact of WFH productivity levels on depression levels. The context of both objectives is the peak period of COVID-19, specifically between March 2020 and March 2021. This study aimed to determine how these relationships were exhibited among B40 citizens in Pulau Pinang, Malaysia.

LITERATURE REVIEW

The concept of mental health and well-being gained global attention while people were following the lockdown procedures enforced by many governments. The Movement Control Order (MCO) impacted people directly (physically) and indirectly (mentally). Therefore, it is important to diagnose instances of people suffering from mental stress. Studies by the World Health Organization (WHO), Wu et al. (2021), and O'Keefe, O'Keefe, and Lavie (2019) stressed the importance of mental health, as the number of people currently living with mental disorders or illness is increasing. These previous studies also reviewed the consequences of mental illness, such as depression, cardiovascular diseases, and anxiety; in the worst case, an individual may commit suicide. Complementing this, it is important to fully understand the definition of mental health.

The World Health Organization (WHO, 2019) defined mental health as a state of well-being in which every individual can realize their own potential, cope with the normal stresses of life, work productively and fruitfully, and contribute to their community. Another definition of mental health was given by Vázquez, Perez-Sales, and Hervás (2008), who stated that mental health and mental symptoms are not merely opposite ends of a continuum but two separate dimensions that should be considered and evaluated separately. According to this study, the dominant view of mental health is that it should be measured using positive (psychological well-being) and negative (symptoms, difficulties, and impairment) impacts. Therefore, it seems that the positive aspects of functioning and well-being should be seriously considered when analyzing the effects of mental health, especially on psychological adjustment. The dominant view of mental health has traditionally been pathogenic, with a narrow focus on symptoms (Seligman & Csikszentmihalyi, 2014).

Housing costs and mental stress

Housing costs or housing affordability is becoming a serious issue, including in Malaysia. Many previous studies have investigated housing affordability, such as those by Kepili (2020a), Kepili (2020)b and Mia and Zull (2020). Discussions of housing affordability are always related to the difficulty of obtaining adequate, appropriate, and secure accommodation at a practicable cost. Most lower-income households (B40) spend about 30% of their budget on meeting their housing costs, which could contribute to housing stress (Kepili, 2019).

In the narrowest terms, housing stress refers only to financial strains measured by housing affordability indicators (Morris, 2018; Chung et al., 2020). Studies have reported that poor housing affordability affects depression levels due to the stress of housing payment difficulties (Bentley, Baker, Mason, et al., 2011). However, social epidemiological studies have also found that overcrowding, residential instability, a lack of safety, and poor relationships with

Ema Izati Zull Kepili, , Nik Hadiyan Nik Azman, Asrenee Ab Razak, Suraiyati Rahman
The Impact of Home Financing Costs and The Built Environment on The Depression Levels of Lower-Income
Employees Working from Home During the Covid-19 Pandemic (March 2020 - March 2021)

neighbors and landlords could cause stress and depression (Quinn et al, 2010; Li and Liu, 2018). Thus, there has been a call for an expanded conceptualization of housing stress, reflecting the fact that many households spend a high proportion of their budget on housing costs, so they must calculate carefully when preparing for their housing needs. The worst-case scenario is that they do not have adequate resources to meet their non-housing needs. In other words, lower-income households have more limited financial resources that prevent them from fully participating in society (financial stress).

Financial stress could be defined as the inability of a person to achieve healthy financial planning; such people may suffer from financial disorders such as compulsive buying disorder, financial infidelity, financial pathology, and financial enmeshment (Klontz, Britt, Archuleta, & Klontz, 2012). An unhealthy financial status could affect an individual's life. They might be in a state of depression or instability (both mental and physical). According to Harding and Szukalska (2000), to maintain the standards of living among lower-income earners, it is necessary to reduce housing costs instead of controlling a household's capacity.

Built environment and depression
Since the 1980s, sociological theories have identified different features of the built environment as stress generators that impact on mental health and individual performance, while stress may be powerfully mitigated by environmental enhancements. Hence the concept of 'home sweet home', conveying the idea that the home is a place where most people feel comfortable, as well as free from control and surveillance. The most important aspect is the capacity of the home to deliver the deepest psychological sense to an individual. In fact, humans spend more than 90% of their lives indoors, which is connected to the requirement for ambient environmental conditions that assist in building positive and healthy surroundings. A study by Matheson et al. (2006) indicated that investing in a comfortable home designed to fulfil the buyer's satisfaction had a direct impact on their social and economic development, as well as being linked with depression status.

This finding is supported by the work of researchers such as Mari-Dell'Olmo et al. (2017), Sederer (2016), and Shaw (2004), who recognized housing as one of the key determinant social factors affecting mental health. According to Dunn and Hayes (2000), the built environment affects depression and mental health in two major ways: first, due to the characteristics of the built environment (higher residential density) and, second, due to the characteristics of the environment (such as crowding, noise, indoor air quality, and light). In short, this means that housing design, housing quality, and social and economic aspects such as affordability, tenure, and crowding all impact individual mental health.

Evans (2003) summarized that higher-quality housing, including better building structures and indoor amenities (e.g., private baths and central heating) was positively associated with better mental health.

In contrast, if one lacks privacy, a sense of control, and autonomy in one's home, this may generate pathological manifestations such as anxiety, depression, insomnia, paranoid feelings, and social dysfunction (Bonnefoy, 2007). Limited space in which to build an environment directly contributes to social isolation among mothers and restricted play opportunities for children, potentially causing mental stress. Housing space limitations are usually related to more high-rise accommodation, especially in urban areas, which are generally populated by low-income families. The growth in this form of housing usually results in insufficient spaces and maintenance, sometimes diminishing individual feelings of ease and indirectly becoming a breeding ground for psychosis (Abbot, 2012; Kennedy & Adolphs, 2011). Besides, cities and urban areas are often perceived as stressful as residents are overwhelmed by pollution, unhealthy features, and alienation. Therefore, depressive symptoms always appear among people who live in stressful environments.

Employee productivity and health
Company or organization performance is very closely related to employee performance (Uysal and Sirgy, 2019). Most people consider their work an important resource that affects their physical and psychological well-being (Warr and Nielsen, 208). During the lockdown period and when confronted by the phenomena of COVID-19, employee productivity was one of the crucial determinants being monitored by employers. During the lockdown period, employees were urged to work remotely, which delivered a new set of challenges to working productively. For example, some were distracted by family members, children, or neighbors, which led to unhealthy lifestyles among workers and work stress.

According to Tongchaiprasit and Ariyabuddhiphongs (2016), work stress refers to a situation in which work requirements exceed an employee's capability, resources, and needs. Moreover, a study by Karatepe et al. (2018) mentioned that more than half of all employees underwent intense stress, and two-thirds encountered difficulties in focusing on their jobs due to stress. Stress cannot be neglected as it will also affect others. Besides, stress can bring about other individual health issues, which could exacerbate existing mental health issues (Tongchaiprasit et al., 2016). Poor housing quality creates depressive symptoms among workers and significantly affects the working performance of a company or organization. Working in isolation while also socially isolated in a small, limited place and workspace, along with difficulties in distinguishing between leisure and working time, tends to result in poor worker productivity

Ema Izati Zull Kepili, , Nik Hadiyan Nik Azman, Asrenee Ab Razak, Suraiyati Rahman
The Impact of Home Financing Costs and The Built Environment on The Depression Levels of Lower-Income
Employees Working from Home During the Covid-19 Pandemic (March 2020 - March 2021)

(GGöcer et al., 2019). This reduced productivity impacts physical health and health inequalities (Mezzoiuso et al., 2017). Employees performing poorly tend to exhibit, for instance, burnout, mental exhaustion, and a lack of enthusiasm, factors leading to poor health. Therefore, these factors are ultimately translated into employee productivity and performance. To address the problem, Akgunduz (2015) suggested reducing the workload and increasing the attention turnover.

RESEARCH METHODOLOGY

This research design features a quantitative method and a survey technique, while the analysis was conducted using SEM-PLS. As stated by Amaratunga et al. (2002), quantitative research helps the researcher to establish statistical evidence for the strengths of relationships between exogenous and endogenous constructs. Furthermore, Cresswell (1994) proposed that quantitative research delivers a level of valid and reliable outcomes that could be applied by other researchers. Bowen (2006) described quantitative research methods as reducing data to quantifiable pieces of facts and figures, which are examined statistically to create generalizations from the survey group to other individuals.

The survey technique used in the current study employed questionnaires as the research instrument. These were first shared with a panel for validation, after which the questionnaires were distributed to the respective respondents. The questionnaires were distributed physically and following strict SOPs. Regarding the sample, the authors distributed about 250 questionnaires and collected 128. G-power was used to determine the appropriate sample size for analysis. The sampling method used was purposive sampling. This sampling method involves selections being made based on the researcher's knowledge of the population and which type of sample would best suit his or her goals (Wolfer, 2007). This is an especially useful technique if the population of interest can be easily identified but is not easily listed (Wolfer, 2007).

Since this study involved pre-determined criteria, such as lower-income (B40) households, purposive sampling was a suitable approach. The analysis started with the data being screened and coded accordingly. IBM SPSS and Structural Equation Modeling (SEM)-PLS were used to analyze the data.
To identify whether the model fitted the data, several goodness-of-fit indices were used during SEM. Following the test for model fitness, reliability and validity tests were also conducted to assess the consistency of the measuring instrument used to measure the concept it was measuring and how well that instrument was developed to measure the concept it was intended to measure.

SEM, which has been employed for a relatively long time, has recently become one of the most widely used statistical tools in certain areas of social science research (Hair et al., 2007). Basically, SEM can be described as a statistical methodology that takes a confirmatory (hypothesis testing) approach to

analyze proposed study frameworks. SEM tests the entire model, not just part of it. The complete model is therefore either accepted or rejected; in other words, the model either fits the data or does not. SEM was selected for this study for several reasons. First, it permits the operation of multiple indicators to measure constructs and condense measurement errors by utilizing multiple indicators for each latent variable (Bryne, 2013). Second, it can assess causal relationships between multiple constructs concurrently (Jöreskog & Sörbom, 1981). Third, SEM can generate awareness of the direction of the study constructs, and it can test how, and to what extent, variables affect each other (Judge & Ferris, 1993).

RESULT AND ANALYSIS

The profile of the respondents to this study represented 128 individuals from the B40 community living in Pulau Pinang. The largest proportion of respondents were Malay (96%), while the remainder were Indian (4%). The majority of the respondents were between 41 and 50 years old (55.5%). Most had at least secondary education. About 56.3% of the respondents had Certificate or Diploma qualifications and, surprisingly, some respondents had Master's degrees (10.2%). Most owned their own house (57%) and one-third were renting. Sadly, more than half of the respondents had lost all their income during the MCO, while over 30% of the respondents had lost from 10% to more than 30% of their monthly income. Nearly 60% of the respondents had missed more than three months of loan/rental repayments but 37% had been able to make their loan payments as usual. Due to the difficulties of maintaining their loans and rental expenditure, 54% had been forced to move to their parents' house and nearly 10% had sold their houses.

The majority of the respondents lived in households of four to six people and about half were living in units measuring 601 to 700 sqf.

Table 1: Respondents' Profile

Variables	Category	Sample size [%]
Race	Malay	124 [96.9]
	Indian	4[3.1]
Gender	Male	43 [33.6]
	Female	85 [66.4]
Age	19-30 years	5 [3.9]
	31-40 years	32 [25.0]
	41-50 years	71 [55.5]
	51-60 years	16 [12.5]
	Others	4 [3.1]

| Variables	Category	Sample size [%]
Education	Secondary School	26 [20.3]
	Certificate/Diploma	72 [56.3]
	Bachelor's degree	17 [13.3]
	Master's	13 [10.2]
Ownership of the House	Renter	43 [33.6]
	Own house	73 [57.0]
	Other	12 [9.4]
Income Loss	10-30 percent	27 [21.1]
	more than 30 percent	20 [15.6]
	total loss	69 [53.9]
	others	12 [9.4]
Ability to Pay Loan/Rental	paid as usual	47 [36.7]
	missed 1-3 months	2 [1.6]
	missed more than 3 months	73 [57.0]
	others	6 [4.7]
Due to the difficulties of making my loan/rent payments, I	sold my house	12 [9.4]
	moved to a smaller house	6 [4.7]
	move to my parents' house	69 [53.9]
Number of Occupants	1-3	57 [44.5]
	4-6	66 [51.6]
	7-9	5[3.9]
Floor Space	less than 500 sqf	19 [14.8]
	about 500-600 sqf	18 [14.1]
	601-700 sqf	61 [47.7]
	701-1000 sqf	12 [9.4]
	more than 1000 sqf	18 [14.1]

N=128
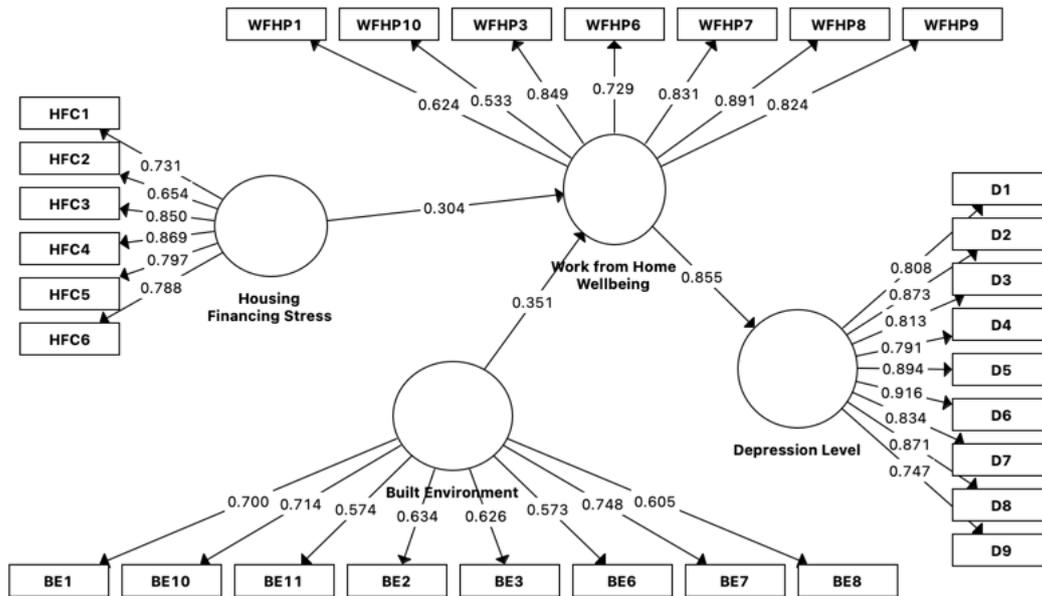
Figure 1: Measurement Model

In the next section, the measurement model is reviewed. According to Hair, Matthews, Matthews, and Sarstedt (2017), convergent validity is the degree to which indicators of a specific construct converge or share a high proportion of variance in common, as shown in Table 2. The convergent validity of the study was assessed using the indicators proposed by Sarstedt et al. (2022). They proposed having an average extracted variance (AVE) greater than 0.5, a cut-off value for factor loading of 0.5, and all composite reliability (CR) values greater than 0.7. All the items had loadings of 0.5 or higher. Table 2 shows that the AVE was greater than 0.5 and the CR was greater than 0.7. At this point, it was determined that the structure met the criteria for both reliability and convergence validity.

Table 2: Measurement Results.

Construct	Item	Loading	CR	AVE
Housing Financing Costs (HFC)	Other than government financial initiatives, most of the time I depended on my parents to pay my home loan/rental costs (HFC1)	0.539	0.906	0.621
	Other than government financial initiatives, most of the time I depended on my friends to pay my home loan/rental costs (HFC2)	0.648		
	Other than government financial initiatives, most of the time I depended on a third party (e.g., NGO or Zakat) to pay my home loan/rental costs (HFC3)	0.731		
	I pawned all my jewelry to pay my home loan/rental costs (HFC4)	0.839		
	I skipped paying insurance to pay my home loan/rental costs (HFC5)	0.771		
	I used my savings to pay my home loan/rental costs (HFC6)	0.736		
Built Environment (BE)	I felt comfortable living with the other residents when WFH (BE1)	0.517	0.846	0.541
	I felt cosy with the air ventilation in my home when WFH (BE2)	0.759		
	I felt relaxed with the artificial lighting in my house when WFH (BE3)	0.838		
	I felt relieved WFH because my neighborhood crime was low (BE6)	0.647		
	During WFH, most of the time when looking at the screen, my eye-line was level with the address bar (BE7)	0.605		
	During WFH, most of the time my elbow was fully flush with my table height (BE8)	0.753		
	(For office chair users only) During WFH, most of the time I put a cushion under my buttocks to raise my hips (BE10)	0.600		
	During WFH, most of the time I took a 20-second break every 20 minutes and moved 20 feet away (BE11)	0.500		
Work from Home Well-being (WFHP)	I lacked the energy to be consistently productive when WFH (WFHP1)	0.576	0.905	0.584
	I became easily irritable/impatient when WFH (WFHP3)	0.824		
	I often felt like leaving my work when WFH (WFHP6)	0.637		
	I often felt hopeless when doing my job during WFH (WFHP7)	0.740		
	I felt bored WFH (WFHP8)	0.867		
	I had sleeping problems when WFH (WFHP9)	0.763		
	I felt satisfied with my job accomplishment when WFH (WFHP10)	0.575		
Depression Level (D)	I had little interest in doing things when WFH (D1)	0.834	0.956	0.706
	I felt down, depressed, or hopeless when WFH (D2)	0.839		
	I had trouble falling or staying asleep, or I slept too much, when WFH (D3)	0.817		
	I felt tired/had little energy when WFH (D4)	0.751		
	I had a poor appetite or I overate when WFH (D5)	0.825		
	I felt bad about myself or felt like a failure when WFH (D6)	0.845		
	I had trouble concentrating on things when WFH (D7)	0.798		
	I moved or spoke so slowly when WFH (D8)	0.801		
	I felt useless when WFH (D9)	0.664		

Deleted Items: WFH (2,4,5); BE (4,5,9)

As a result, the model's discriminant validity was investigated further. Fornell and Larcker (1981) proposed that items should load more strongly on their constructs than on the other constructs in the model. Furthermore, the average variance (AVE) shared by each construct and its measures should be greater than the variance shared by the constructs themselves. Its measures must be greater than the variance shared by the construct and the other constructs. The discriminant validity of the study is shown in Table 3.

Table 3: Discriminant Validity

	1	**2**	**3**	**4**
1. Built Environment	0.641			
2. Depression Level	0.53	0.84		
3. Housing Financing Stress	0.548	0.519	0.788	
4. Work from Home Well-being	0.515	0.855	0.469	0.764

Following that, interaction terms were added to represent the quadratic effects. The bootstrapping results from 5,000 samples and the absence of significant changes revealed that none of the non-linear effects were significant. The proposed hypotheses were then examined. Between the constructs, three direct hypotheses were developed. T-statistics for all the paths were generated using the Smart PLS 3.0 bootstrapping function to test the significance level. After examining the model's validity and reliability, it was critical to assess the direct hypotheses.

Table 4: Hypothesis Testing

	Std Beta	**Std Error**	**t-value**	**p-value**	**BCI LL**	**BCI UL**	**R^2**
Built Environment -> Work from Home Well-being	0.351	0.068	5.162	0.000	0.241	0.486	0.729
Housing Financing Stress -> Work from Home Well-being	0.304	0.082	3.706	0.000	0.163	0.457	
Work from Home Well-being -> Depression Level	0.855	0.025	33.767	0.000	0.805	0.908	

Three relationships have *t*-values >2.33 and are thus significant at 0.01 (Table 4). The predictor of Built Environment (β=0.351, *p*<0.01) shows a stronger relationship with Work from home well-being compared to Housing financing stress (β=0.304, *p*<0.01), yet both demonstrate positive and significant relationships with Work from home well-being. In addition, the relationship between Work from home well-being and Depression level was assessed

Ema Izati Zull Kepili, , Nik Hadiyan Nik Azman, Asrenee Ab Razak, Suraiyati Rahman
The Impact of Home Financing Costs and The Built Environment on The Depression Levels of Lower-Income
Employees Working from Home During the Covid-19 Pandemic (March 2020 - March 2021)

(β=0.855, *p*<0.01), the result of which was significant. Therefore, to conclude, all the hypotheses (H$_1$-H$_3$) were supported.
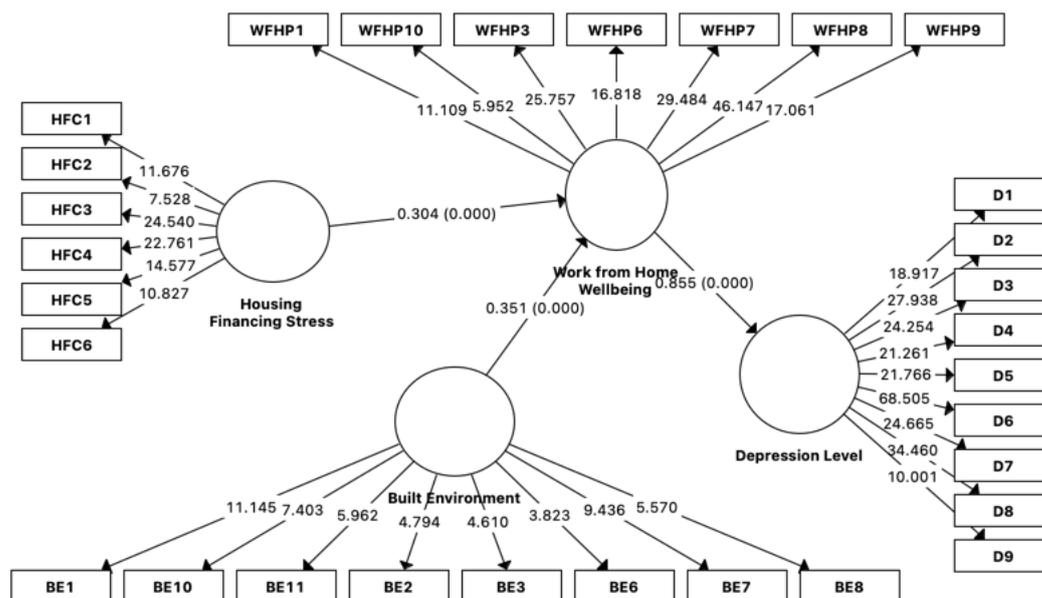

Figure 2: Structural Equation Modeling (SEM)

DISCUSSION

This study aimed to examine the impact of housing financing costs and the built environment on work from home productivity. Consequently, this study was extended to capture the magnitude of the impact of WFH productivity on depression levels. The setting of this research was the Penang area and the respondents were from a B40 (lower-income) background.

Based on the findings, the majority of the respondents who were depressed were between 31 and 50 years old, which is understandable as this study applied to those of working age. When the pandemic peaked between March 2020 and March 2021, and during the imposition of the movement control order, many workers shifted their working conditions from offline to online. While working from home was openly accepted in the early implementation of the MCO, the elation was not long-lasting as the government continued to prolong the restrictions. The lockdown process was extended from a period of only three months to one of around nine months (the first and second phases). The MCO then continued until the end of 2021 (the third phase). The Malaysian government gradually eased the restrictions from the start of 2022, leading to

considerable widespread relief. Finally, on 1 April 2022, the government declared that the country was entering the endemic stage and most offices came 'alive', as they had been during the pre-pandemic period.

Although Malaysia has entered the endemic stage, it is believed that the impact of the lockdown situation on the well-being of employees working from home (WFH) has left a significant imprint. Due to the probability of repeating stressors, the impact of quarantine-related stress on levels of depression and mental health is likely to be exacerbated among persons with pre-existing mental illnesses and those susceptible to developing a mental disease. Before examining the impact of WFH on depression levels, the authors suggest that the built environment and housing financing costs influenced WFH productivity levels.

According to the findings, the built environment has a stronger link (compared to housing financing costs) with WFH productivity (refer to Table 4; $\beta=0.351$, $p=0.01$). The relationship between the built environment and WFH is positive, as had been expected. This implies that the environment in which the respondents live influenced their ability to perform work productively. This result can be confirmed by examining the prior findings of Dunn and Hayes (2000), who stated that investing in a comfortable home to meet one's needs has a direct impact on one's productivity at work. Based on the top loading results (Table 2), the respondents of this study suggested that they felt comfortable working in an environment with artificial lighting (0.838), good air ventilation flow (0.759), and when they could adjust their sitting position to ensure their elbows were fully flush with the table height (0.753).

A positive and significant link was also identified between home financing costs and WFH production (refer to Table 4; $\beta=0.304$, $p=0.01$), which suggested that higher housing financing costs caused WFH productivity to increase. This is somewhat interesting because the authors expected this relationship to be negative. Nonetheless, it is believed that the pandemic situation played a major role in this result. During the COVID-19 pandemic, many companies suffered revenue losses, employee numbers were reduced, profits were nearly nil, and businesses had to cut operational costs to stay afloat. The pandemic was a stressful period and, based on the current findings, nearly 70% of the respondents lost more than 30% of their income. In addition, nearly 60% missed more than one month of their loan repayments. This unfortunate scenario could indicate that the stress of managing debts to financial institutions caused employees to work harder to ensure that they could continue earning money to survive. The majority of the respondents had pawned their jewelry to make loan or rent payments during the epidemic.

To address the second objective, that is, to determine the impact of WFH productivity levels on depression, a possible positive relationship was

Ema Izati Zull Kepili, , Nik Hadiyan Nik Azman, Asrenee Ab Razak, Suraiyati Rahman
The Impact of Home Financing Costs and The Built Environment on The Depression Levels of Lower-Income
Employees Working from Home During the Covid-19 Pandemic (March 2020 - March 2021)

anticipated. Based on the findings (Table 4; β=0.855, p=0.01), the relationship was found to be both positive and significant, which implies that higher WFH loads contributed to greater levels of depression among the respondents. This study is supported by previous findings by Tongchaiprasit and Ariyabuddhiphongs (2016), who stated that job stress occurs when an employee's capability, resources, or work demands exceed their capability, resources, or needs. In fact, according to a study by Karatepe et al. (2018), over half of all employees experience acute stress, while two-thirds have difficulty focusing on their duties because of stress.

The measurement results (Table 2) demonstrate that the majority of the respondents to this study felt gloomy, dejected, and hopeless when working at home (0.839), while they became easily irritable and impatient while doing so (0.824). A higher loading of 0.763 indicated that the respondents had sleeping problems when WFH. In terms of depression, many felt bad about themselves or felt like a failure during the lockdown period (0.845). They felt down, depressed, and even hopeless when WFH (0.839), apart from having lost interest in doing other activities.

Indeed, the reality of WFH is not as efficacious as many had believed in the pre-pandemic era, perhaps due to the enforced lockdown situation. Housing financing costs and the built environment were found to have positive impacts on WFH productivity but at the expense of increasing depression levels among B40 individuals.

CONCLUSION

Before COVID-19 forced the world to stay indoors, people tended to express optimistic ideas about working from home (WFH). It was imagined WFH could help to alleviate the work-life imbalance as it offers a flexible approach to performing both office tasks and household errands. This idea, however, was challenged when countries imposed lockdowns or, as in Malaysia, mobility was controlled in various phases. As life had to continue, office work changed with the introduction of new practices such as WFH, an idea welcomed by many. Unfortunately, the lower-income group may not share this contentment since their work is generally labour-based, such as selling at food stalls. Thus, the mobility restrictions hampered their capacity to make an income, with significant numbers losing all their income. Their work nature must be altered to suit WFH conditions.

Aiming to examine the impact of housing financing costs and the built environment on WFH productivity levels, the authors extended this relationship by observing how WFH productivity levels influenced levels of depression. In summary, although housing financing costs and the built environment were seen as positive contributors to productivity levels, this positivity had the drawback of

being linked with higher levels of depression. WFH might have caused the respondents to face desperate situations, with the need for an income to pay home loan or rental costs pushing them to work harder. Thus, despite living in smaller spaces (700 – 800 sqf) and with an average of five to six persons living in a unit, the respondents were forced to utilize their living areas to work. This is a possible reason for the positive relationship between the built environment and productivity levels. The stress of experiencing these factors, however, translated into higher depression levels, with the results showing a negative relationship. This is an alarming reality on which policymakers must focus.

This study, however, has some imperfections, indicating that more research is warranted in this field. Future studies could investigate the topic using more respondents to gauge a better estimate. Meanwhile, future researchers could concentrate on female respondents to measure the influence of depression on the household.

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The Impact of Home Financing Costs and the Built Environment on the Depression Levels of Lower-Income Employees Working from Home During the COVID-19 Pandemic (March 2020 - March 2021)

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Ema Izati Zull Kepili, , Nik Hadiyan Nik Azman, Asrenee Ab Razak, Suraiyati Rahman
The Impact of Home Financing Costs and The Built Environment on The Depression Levels of Lower-Income
Employees Working from Home During the Covid-19 Pandemic (March 2020 - March 2021)

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THE REGULATORS' PERSPECTIVES AND CHALLENGES IN IMPLEMENTING VILLAGE ASSET PERFORMANCE MEASUREMENT

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Abstract

The aim of this study is to assess the possibility of the village asset performance measurement implementation that is yet available in Indonesia. The assessment is focused on the regulation perspective and readiness of the village. This study uses qualitative approach that examines the condition of natural objects where the author acts as a key instrument that digs up data, examines data, and interprets data. The research samples were taken by applying purposive sampling and snowball sampling techniques. The results show that there are at least two challenges and opportunities of asset performance measurement implementations. Firstly, the opportunity for implementation comes from the existing Village Law that enables the government to make lower regulations as a basis to implement asset performance measurement. In addition, the complexity of village natures and autonomies should be adopted by the regulation created by the government. Secondly, village administration readiness is also an implementation challenge. Other challenges include village leadership issues, land problems, professionalism, and human resources. This study was conducted in the Indonesian context. Further research is required to create an experiment of asset performance measurement experiment so that the hurdles of the implementation can be furtherly analyzed. These findings are likely to have significant implications for both local and central governments to create policies and regulations related to asset performance measurement implementation.

Keyword: Asset performance, Asset performance measurement, village asset, implementation

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INTRODUCTION

The village administration finds that the village assets are a significant resource to fund its operation. Thus, these facilities have to be operated effectively and efficiently so that the village administration is benefited most favorably. One of the functions of village assets is to support village administration tasks accomplishment. Due to the importance of village asset management, the Central Government, through its department, the Ministry of Home Affairs, has regulated it in the Ministry of Home Affairs Regulation Number 1 of 2016 (Rachmawati et al., 2018).

In addition to that, the upper regulation, Law Number 6 of 2014 concerning Villages stated that the village government is the one that is responsible for conducting village asset management. Village assets, by definition, are economic sources that are managed and/or owned by the village authority sourced from the original village wealth, obtained at the expense of the village income or other legal rights acquisition. Given the significance of controlling village-owned assets, it has become necessary for the village authority to control village-owned assets in a professional, effective, and economical manner so that the economic welfare of the village community can be achieved through the utilization of village assets (Saputra et al., 2020).

Village asset management is a method in the process of resource management conducted by a group of village communities starting from asset planning to asset supervision to attain village goals (Risnawati, 2017). The Minister of Home Affairs Regulation No. 1/2016 states that the management of village assets is a sequence of activities including planning, acquisition, utilization, security, preservation, extermination, displacement, administration, reporting, valuation, education, supervision, and control of village assets (Rachmawati et al., 2018).

In practice, the village asset management has to be conducted in an utmost way so that asset optimization can be achieved. Asset optimization is a process in asset management that has the objective to increase the physical, location, value, legal, and economic capacity of the assets (Sriastiti et al., 2020). The exact data related to the need for village asset optimization is yet to be found, however, data taken from State Supreme Court Asset Information System in 2018 shows that of 65 state-owned houses in District Court and Denpasar High Court, 15 houses are not occupied, 20 houses are damaged lightly, and 3 houses are damaged severely (Sriastiti et al., 2020).

Thus, some scholars suggest the need for alignment between assets and the need of the users, assets and the government goal, and assets and financial policy (van der Schaaf, 2002). To achieve that, three principles should be acknowledged by the government as asset managers. The first principle is that the government has to recognize the productive assets that support its goal. The next principle is that collaboration between the government and private sector

enables the optimization of assets. The last is that the government should open the opportunity to adopt private sector management practices (Kaganova, 2006).

Given the principles stated above, performance measurement can be used to optimize the levels of effectiveness and competitiveness of the village asset management. The purpose of performance measurement is to create information that can be used to figure out various problems and can be implemented in certain circumstances (Zairi, 1994). Performance measurement gives the groundwork for an institution to evaluate how well it is advancing towards its foreordained targets, to analyze areas of strengths and weaknesses, and to determine future activities, expecting to increase institutional performance (Amaratunga & Baldry, 2002).

In another word, performance measurement can also be defined as a significant tool to create judgments and decisions on business improvement (Riratanaphong & van der Voordt, 2015). Performance measurement can aid the decision makers to answer some deliberately significant inquiries such as: 1) where is our current position? 2) Where is our goal? 3) How do we reach the goal? and 4) How do we know that we have reached the goal? (Lebas, 1995).

The aim of this study is to assess the possibility of the village asset performance measurement implementation that is yet available in Indonesia. The assessment is focused on the regulation perspective and readiness of the village. In addition to that, the scheme of the village asset performance measurement implementation is created to depict the local theory as the output of this research.

LITERATURE REVIEW

The Village term can be described as having several meanings from a sociological point of view, an economic point of view, and a political point of view. From a sociological perspective, The Village can be depicted as a community unit or community of residents who live and settle in an environment where they know each other well and their lifestyle is relatively homogeneous and depends a lot on natural gifts (Sirajuddin, 2016). Meanwhile, from an economic perspective, The Village can be explained as a community environment fulfilling their daily needs from what is provided by the surrounding nature. In this second sense, the village is an economic environment, in which the population strives to meet the necessities of life (Sirajuddin, 2016). At last, from a political perspective, The Village can be described as a government or organization that politically has authority. In this third sense, the village is often defined as "a community unit". the law that has the power to organize its government (Sirajuddin, 2016).

The village assets, according to the provisions in Article 76 of the Village Law, are village treasury lands, *ulayat* lands (customary communal land), village markets, animal markets, additional boats, village buildings, fish auctions, agricultural product auctions, village-owned forests, village-owned springs,

public baths, and other assets belong to the village. According to Minister of Home Affair Regulation No.1 of 2016, village assets are property belonging to the Village originating from the original assets of the Village, purchased or obtained at the expense of the Village Income and Expenditure Budget (APBDesa) or other legal rights acquisition (Heriningsih et al., 2017).

The provisions for the distribution of types of village assets are stated in Article 2 of Minister of Home Affair Regulation No.1 of 2016, which consists of village original wealth, village property purchased or obtained at the expense of APBDesa, village assets obtained from grants and donations, etc, village assets obtained as the implementation of an agreement/contract and/or obtained based on the provisions of statutory regulations, the results of village cooperation, and village assets derived from other legitimate acquisitions (Heriningsih et al., 2017).

The concept of Asset Management and Asset Performance Measurement is lacking in the theories specifically discussing the area of Village-level. To measure asset performance, there are four major categories to be focused on, which are financial, physical, functional, and survey-based (Lavy et al., 2010). Moreover, benchmarking should be considered a critical performance measurement tool that allows institutions to achieve added value and excellent performance (Camp & Camp Robert, 1989). It is necessary to spotlight that the type of the services provided is subjective to measure, and acknowledge that benchmarking should also measure "hard" and "soft" issues in facilities performance (Pitt & Tucker, 2008). Based on the discussion above, we believe that there is room to be dug up, which is the implementation of asset performance measurement focusing on local aspects such as villages in Indonesia.

RESEARCH METHODS
Primary data collection will be carried out by interviewing parties related to the issues discussed either directly or indirectly. The technique of selecting informants will be carried out by using purposive sampling and snowball sampling techniques. The technique is executed by selecting the initial informants purposely, based on those who have qualified knowledge of the problems, have a decent understanding of the issues, and are willing to provide data. Furthermore, the initial informant is allowed to recommend additional informants who can provide further information. The backgrounds of the key informants were chosen with several criteria such as having a government background and working in the ministry managing the village assets.

FINDING AND DISCUSSIONS
Regulation Perspective
Based on Law number 6 of 2014, the asset performance measurement is not yet regulated specifically. However, there is chapter, 77, in Law number 6 indirectly

regulates the asset performance measurement. The detail of chapter 77 verse 1 is as follows "Village property management is implemented based on the principles of public interest, functional, legal certainty, openness, efficiency, effectiveness, accountability, and certainty of economic value". Village asset is a part of village property so, in terms of asset performance measurement, a part of asset management should complete the existing village asset management. In addition, in verse 2, "Village property management is carried out for improving welfare and standard of living in the village community and increasing village income". The asset performance measurement implementation can be used to measure the readiness of village assets that in the immediate future will provide benefits for the village people socially and economically. To be implemented, a derivative regulation should be created by the government. Furthermore, based on the national long-term plan for 2005-2025, Law number 7 of 2007, the significance of village asset performance measurement is yet to be found.

Despite the opportunity to create derivative regulation, the scope of the regulation is another challenge for the government. Before implementing village asset management regulation, the government should be aware of two concepts related to democratic governance and pro-poor policy (Borras Jr & Franco, 2008). They affirmed that village asset management is not merely an administrative problem such as asset registration and asset administration yet village asset management should be a solution to socio-agrarian problems such as over-exploitation and economic inequality that can be solved by democratic governance accommodating also social, economic, and political needs from village society. The latter concept, pro-poor policy, affirmed that the regulation should provide benefit more to the poor people. To be classified as a pro-poor policy, several policy characteristics should be existed such as protection and transfer of wealth based on resources, transfer of resources based on political power, historical awareness, social class awareness, gender awareness, ethnic awareness, increase and development of productivity, and rights enforcement (Borras Jr & Franco, 2010).

Based on the interview, the regulation cannot be implemented generally, since each village has its characteristics and it violates the village autonomy ruled by village law. The village autonomy enables villages to govern themselves in terms of village assets. However, there is an opportunity to implement the regulation through one village government mechanism called The Village Council. The Village Council is a democratic body regulated by Village Law to accommodate the village people's aspirations. By using Village Council, the implementation of asset performance measurement regulation can be enforced.

The other opportunities are the implementation of asset performance measurement at the ministry levels. At a minimum, two regulations are implemented at the ministry level such as Ministry of Public Works Decree

Number 13 of 2012 relating to irrigation asset management and Ministry of Finance Decree Number 349 or 2018 relating to procedures for implementing state asset performance evaluation. Based on the Ministry of Public Works Decree Number 13 of 2012, irrigation performance is measured by several indicators such as infrastructure condition, water availability, landscape index, supporting facility, personnel organization, documentation, and the water user association. Meanwhile, based on the Ministry of Finance Decree Number 349 of 2018, the performance measurement guidance is used to measure the performance of state assets by using several indicators such as public interest, social benefit, stakeholder satisfaction, the asset's future potential, asset financial feasibility, and technical condition. Both of the decrees can be used as a benchmark for creating derivative regulations to implement the village asset performance measurement. Besides, village asset performance measurement can be used as a tool of village asset optimization that is regulated by President Regulation Number 18 of 2020 related to the medium-term work plan for 2020-2024. To enhance, the central government should be aware that every village has its own culture/local wisdom related to village asset utilization so the government should accommodate it in the form of written regulation or in the form of less formal regulation.

On the other hand, having been revised by the Constitutional Court decision Number 91/PUU-XVIII/2020 related to omnibus law, the village asset such as lands or buildings can be used as the village-owned enterprises' equity creates potentially fraud in a form of village asset transfer from village asset to village-owned enterprises asset. The fraud possibility was also confirmed by one of the interviewees that in many cases, the practices of transferring the village asset to the village-owned enterprises assets frequently occurred. It violated the regulation that the village assets are forbidden to transfer. The comprehensive harmonization of the regulations from top-to-down, from central government-to-village government, should be done, in order to boost the optimization of the village assets.

Village Administrations Readiness
Generally, the village administration's readiness can be measured quantitatively, however, in this study, village administration readiness was assumed from the problems captured by interview results and previous research.

Land Issues
Some village administrations have problems regarding land acquisitions. Some village lands were sold which violated the village regulation stating that village land is forbidden to sell unless land replacement exists. Similarly, some cases showed that the village asset registrations are purposely ignored by the village administrations to protect some village elites' interests.

The land problem can be observed from two perspectives, the village assets administration perspective and the asset security context. In the context of the Village Assets administration, mainly at the inventory level, challenges of disappearing village assets, such as land and buildings, emerged because of the absence of legal status of the properties. In many cases, the village governments own weaker legal documents of the land such as a village-level document, called a *girik* or a letter C. The phenomenon was confirmed by our informants. In addition, the phenomenon was explained in Article 76 paragraph 5 of the Village Law in conjunction with the Omnibus Law. It stated that Village Assets taken over by the Regency/Municipal Government must be returned to the Village Government, except the village assets that are used for public facilities. In practice, this phenomenon becomes a problem since the registered village assets belong to the village government. Consequently, the registered village asset cannot be used optimally by the village government for the benefit of the village community. The hurdles of administering village assets need to be encouraged by a regulation created by the President to make settlement of village assets.

In the context of asset security, village assets have not met the most important principles, mainly administrative order, legal order, and physical order. In the administrative context, the village assets, in the form of land and buildings, are not equipped with proper legal status in the form of use rights certificates. In the legal context, the release of land assets is actually through equity participation in the village-owned enterprises (VOEs), so that it can be used for financing the business of the VOEs. Therefore, Government Regulation Number 11 of 2021 limits the village assets that may include equity other than land and buildings. Government Regulation Number 11 of 2021 concerning Village-Owned Enterprises is a derivative of Law Number 11 of 2020 concerning Job Creation. In the physical context, land and buildings owned by the Village Government are controlled or owned by other parties. The findings supported previous research related to the fraud possibility in village asset management. In some cases, land owned by the Village Government was sold to build buildings in the absence of Village Regulations related to Village Asset Management (Purwanti & Nursiam, 2018)

Village Leadership
According to Ministry of Home Affairs Regulation Number 1 of 2016, the village leader holds the authority and responsibility to manage village assets. In addition to that, the Village leader establishes village asset management policies, determines assistance for village asset management, determines asset utilization, determines the asset transfer, establishes a policy for securing village assets, and approves the proposal for the transfer and disposal of village assets based on the leader's authority.

However, frequently many factors affect the village leader to act based on his authority. The absence of Village Head Regulations related to asset performance measurement is caused by the absence of the upper law regulating asset performance. The existing regulations related to village asset management, Ministry of Home Affairs Regulation Number 1 of 2016, are yet to be implemented fully. The village asset, in many cases, is not registered properly because of many reasons. Some village assets are also leased without fair compensation to the village government, in many cases, caused to the absence of Village Leader Regulations concerning village asset management (Purwanti & Nursiam, 2018). The findings were also affirmed by the interviewees. The village leaders have a central role in asset optimization by enforcing asset administration and asset security.

Lack of Proper Human Resources
Frequently, Village Administrations lack human resources capable of managing village assets. In many cases, the human resources competencies to manage village assets do not fulfil the asset management field requirements (Pobela et al., 2017). One important solution for solving human resources problems is by creating training to increase human resources skills, knowledge, and ability related to village asset management (Budiman & Rudi, 2002). In addition, the sustainability of education and training related to village asset management should be the priority of the village government (Martoyo, 2000). Besides that, based on the previous research, human resources development is positively affected by society participation. So, in order to increase the capacity of human resources development, social participation must be enforced (Uceng et al., 2019)

However, the village conditions that are diverse in terms of background, infrastructure disparities, cultural diversity, and also the quality of their human resources provide challenges that are not the same among villages in Indonesia. It will have an impact on the ideas and creativity of village asset optimization innovations.

Lack of Professionalism
According to Riyanto (2014), the professionalism of the village administrations affected significantly the village government's performance. Another research showed that a lack of administrative professionalism created some problems in the village asset registration and less optimal village asset utilization (Nurina, 2014). Other findings showed that the controlling process that is not optimally accomplished created other problems in the village asset management. The less optimal controlling process is mostly caused by the lack of village government professionalism (Natalia et al., 2017). In the context of VOEs, professionalism in VOEs personnel is significant to be developed so that VOEs can provide an optimal contribution to the Village's Income. By doing this, the measure of

economic profit can be one of the appropriate benchmarks for village asset optimization.

CONCLUSIONS AND RECOMMENDATIONS

To conclude, the implementation of the village asset performance measurement is an opportunity to optimize the village asset. However, the implementation should consider the regulatory challenges and readiness of the village administration such as the classic village land problem, village leadership, lack of proper human resources, and lack of professionalism. However, this study is far from complete. Future studies related to the implementation of the village asset performance measurement should be conducted mainly on the indicators used in the asset performance measurement.

Based on the findings and discussion, several recommendations were created at the central, local, and village government levels. The recommendations can be summarized as follows:

1. The local government should provide full support and assistance to the village administration in order to accomplish the problem frequently occurring in the village asset management. In the cases of local government cannot provide full support and assistance to the village government, local government should empower village administrations by providing training to enhance their asset management competencies;
2. The central government and local government should create regulations related implementation of village asset performance measurement so that it can be implemented to optimize the village asset usage and utilization so that village communities receive benefit from the village asset.

The village leaders can use their authority to create regulations to implement the village asset performance measurement so that they can manage their assets optimally to provide benefit to the village communities.

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NOTES TO CONTRIBUTORS AND GUIDELINES FOR MANUSCRIPT SUBMISSION

INTRODUCTION

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