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A STUDY ON THE DEMAND OF SPATIAL PLANNING AND DECISION SUPPORT SYSTEM IN MALAYSIA

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Abstract

This paper examines the demand and interest for SPDSS (Spatial Planning and Decision Support System) among town planners in Malaysia. A survey was conducted among town planners registered with the Malaysian Institute of Planners (MIP) and among local planning authorities. Based on the survey and analysis, it was revealed that many town planners in Malaysia are still unfamiliar with SPDSS, particularly the concept and its applications. Nevertheless, they have expressed interest to know more about SPDSS as well as to include SPDSS in their professional works.

Keywords: SPDSS, GIS, MCE, Urban Planning

INTRODUCTION

SPDSS is an interactive, computer-based system designed to support a user or group of users in achieving a higher effectiveness of decision making while solving a semi-structured spatial decision problem. As such, it is a useful tool that can help to expedite planning process, as well as help to make decision-making exercises in the process more structured, transparent and accountable.

Despite its proven benefits in overseas planning scenes, SPDSS is still relatively new in Malaysian. At the moment, only a handful of Malaysian planning exercises utilise SPDSS in generating alternatives and assisting decision-making. The application of Multi-Criteria Evaluation (MCE) for the Klang Valley Integrated Transport and Land Use Study and the preparation of National Physical Plan are some examples of SPDSS. At the same time, there have also been researches initiatives conducted, especially by academicians, in trying to integrate SPDSS in planning exercises (Alias Abdullah et-al, 2004).
The Federal Department of Town and Country Planning Peninsular Malaysia (FDTCP), being a federal government department responsible towards the betterment of town planning practice in Malaysia, have been, in recent years,

injected some form of SPDSS into Malaysian town planning practice. However, this has been piece-meal in nature. As a result, the true benefit of SPDSS application in Malaysian town planning practices is yet to be reaped.

FDTCP also sees SPDSS as one of the major planning tools that can contribute towards achieving the Department's goals of Information System Planning (ISP). Thus, the Department has been actively upgrading their staff knowledge relating to SPDSS. Programmes such as 'Geo-technical Spatial Analysis Research and Development' (GSARD) were set up and staff were sent for training, both local and overseas.

One area in Malaysian town planning practice which is seen as having the most immediate potential for SPDSS application is the preparation of development plans[1]. However, observers argued that any move to integrate SPDSS in development plan preparation now might prove to be a little too soon since the level of awareness and knowledge of SPDSS amongst professional town planners in Malaysia may not befit such a move. This is true since the preparation of development plans in Malaysia is conducted on a privatization basis where FDTCP and the local planning authorities[2] will appoint professional town planners as consultants to prepare such plans. The observers argued that a concrete SPDSS knowledge foundation must first be installed among professional town planners before SPDSS can be successfully integrated into development plan preparation.

This argument by the observers is easy to understand, even more when FDTCP had made a similar move previously with regard to the integration of Geographical Information System (GIS) into development plan preparation. In mid-1990s, FDTCP decided to require GIS to be used in the preparation of development plans. Nevertheless, due to limited understanding of GIS among the professional town planners who were appointed to prepare those plans, the move was not a big success. Even today, although GIS is being used in development plans preparation, this mostly being limited to mapping and plan production with very little exploits on its spatial analysis capabilities (Mansur Ibrahim, et-al, 2004).
Taking cue from the GIS episode, the researchers have conducted a survey among town planners and local planning authority officers in Malaysia to

[1] Malaysian development plan system is a three-tier system comprising National Physical Plan, State Structure Plan and District Local Plan /Special Area Plan.
[2] Development plans in Malaysia are usually being prepared by the state/local planning authorities with support from FDTCP.

determine their level of awareness, knowledge and interest on SPDSS. This paper discusses some of the main findings of the survey.

THE SPDSS SURVEY RESULTS

A total of 388 questionnaires were sent out to respondents who are town planners registered with the Malaysian Institute of Planners (MIP) and town planners working at local planning authorities. At the end of the survey period, 81 respondents (21%) participated in the survey by returning completed questionnaire to the researchers. From these 81 respondents, 58 were town planners registered with MIP and 23 were officers from local planning authorities. Out of the 58 registered town planners, half was corporate members and the other half was graduate members (refer Figure 1).

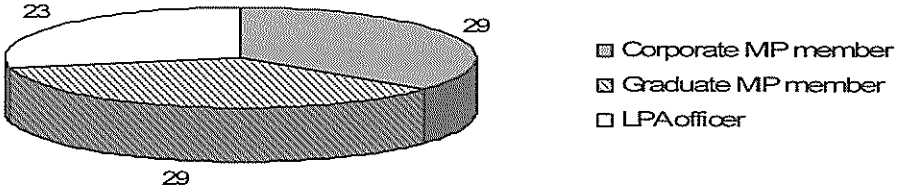

Figure 1: Categories of respondent

Several questions were devised in the questionnaire to help researchers determine the level of SPDSS understanding among respondents. In terms of familiarity to SPDSS, 68% of the respondents answered they were not familiar with SPDSS (refer Figure 2).

Respondents were also asked on how they would define SPDSS. A set of answers (multiple-response) were provided. The result shows that 'Computer-assisted Planning' and 'Geographical Information System' received the highest response (refer Table 1).

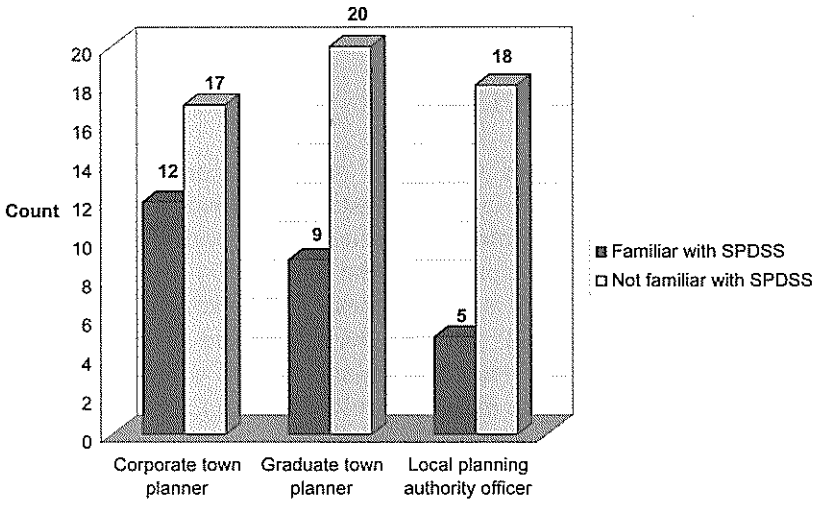

Figure 2: Familiarity with SPDSS

Table 1: Respondents' definition of SPDSS

Definition	Count	% of responses	% of cases
Computer-Assisted Planning	43	28.1	56.6
Analytical Hierarchy Process (AHP)	21	13.7	27.6
Database Management System (DBMS)	32	20.9	42.1
Digital plans and maps	17	11.1	22.4
Geographical Information System (GIS)	35	22.9	46.1
Analytical tool	1	0.7	1.3
Computer-aided planning tool	3	2.0	3.9
No idea	1	0.7	1.3
Total	**153**	**100.0**	

Note: 5 missing cases; 76 valid cases

The results shown in these two tables indicate that the level of understanding of SPDSS among the respondents is rather unsatisfactory. Figure 2 shows that more than half of the respondents were not familiar with SPDSS. This is supported by the results shown in Table 1 where 'Computer-assisted Planning' has been the most chosen definition of SPDSS with GIS comes in second. Although it is quite true that SPDSS in its simplest definition is a computer-based system to assist decision-making pertaining to spatial planning, but the researchers feel that this might not be the reason why many respondents chose 'Computer-assisted Planning' as one of the definition of SPDSS. More likely

the reason is that this definition is the most all encompassing as compared to other definitions provided in the questionnaire. Thus, many respondents might feel that this makes 'Computer-assisted Planning' the most likely correct answer as opposed to other provided definitions.

Although some would categorise GIS as SPDSS, but those that knew SPDSS well would have quickly dismissed GIS as SPDSS (at least not in the truest sense). GIS, at best, can only be considered as decision support system (DSS) generator rather than specific DSS technology. In fact, the development of SPDSS itself stemmed from the need to expand the capabilities of GIS in tackling complex and ill-defined spatial decision problems (Densham & Goodchild, 1989). Because of this, the fact that many respondents have chosen GIS as one of the definition of SPDSS might just reflect their lack of understanding of what SPDSS really is. Another reason why GIS is also popular among the respondents is that many of them are already exposed to the system since GIS is currently embedded into the preparation of development plans in Malaysia. Table 2 below shows the level of exposure among respondents to several analytical software and tools.

Table 2: Software that respondents have used/experienced

Software	Count	% of responses	% of cases
Expert Choice	5	4.2	6.7
Idrisi	2	1.7	2.7
GeoChoice	1	0.8	1.3
ArcGIS/ArcInfo/ArcView	38	31.7	50.7
MapInfo	42	35.0	56.0
ILWIS	5	4.2	6.7
Definite	4	3.3	5.3
What If?	1	0.8	1.3
GenaMap	1	0.8	1.3
GenaSys	1	0.8	1.3
SICAD	1	0.8	1.3
AutoCAD	2	1.7	2.7
Never used any	16	13.3	21.3
Not sure	1	0.8	1.3
Total	**120**	**100.0**	

Note: 6 missing cases; 75 valid cases

From Table 2, it can be seen that respondents have been fairly exposed to GIS software (especially MapInfo and the ESRI's Arc variants) but not to DSS specific software like ILWIS, What If? and Definite for instance. Furthermore,

GIS has been introduced and made popular in Malaysia for quite a number of years. Thus, the popularity of GIS might have also influenced respondents to choose it as one of the answers on the definition of SPDSS (refer Table 1).

Given the choices of SPDSS definition provided in the questionnaire (refer Table 1), one would have expected that AHP (Analytic Hierarchy Process) would be the most selected definition since this is a much better definition of SPDSS compared to the others. However, only 21 respondents selected AHP as one of the answer to the question on how they would define SPDSS.

The cross tabulation shown in Table 3 below further indicates the low level of understanding of SPDSS among the respondents. It can be seen that despite 26 respondents indicated they are familiar with SPDSS, only 11 (42%) chose AHP. One would have expected that if the respondents are proficiently familiar with SPDSS, all 26 of them would have chosen AHP as one of the definition of SPDSS.

Table 3: Cross tabulation between familiarity with SPDSS and AHP as definition for SPDSS

		Would define SPDSS as AHP?		**Total**
		Yes	No answer	
Familiar with SPDSS?	Yes	11	15	26
	No	10	40	50
Total		**21**	**55**	**76**

Note: 5 missing cases

EVALUATION ON THE INTEREST OF SPDSS

Despite the rather unsatisfactory level of SPDSS understanding, there is a high level of interest among the respondents regarding SPDSS. Figure 3 below shows that majority (81%) of the respondents perceived SPDSS as either very important or important to Malaysian planning.

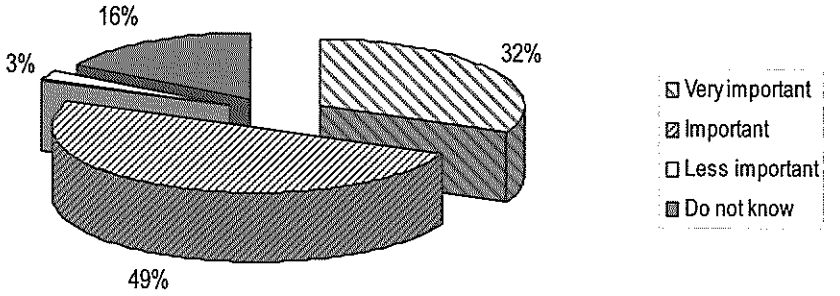

Figure 3: Perception on the importance of SPDSS in Malaysian planning

Additionally, 95% of the respondents expressed their interest to involve SPDSS in their work (refer Figure 4). When asked which area of their work that they would like to incorporate SPDSS, planning analysis and spatial management were the two most popular answers (refer Table 4).

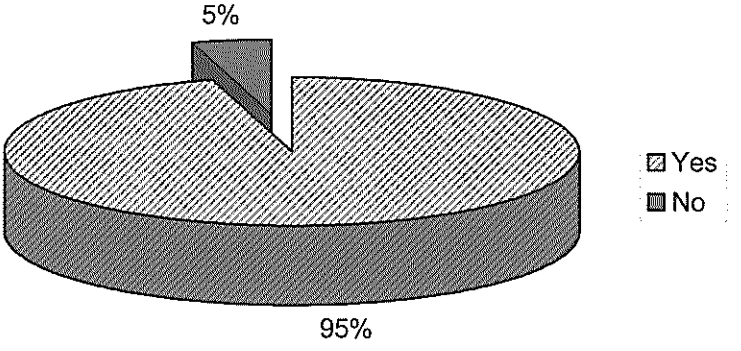

Figure 4: Interest to involve SPDSS in work

Table 4: Area of work to incorporate SPDSS

Area	Count	% of responses	% of cases
Planning analysis	66	45.8	88.0
Procurement	11	7.6	14.7
Layout design	26	18.1	34.7
Spatial management	40	27.8	53.3
Data management	1	0.7	1.3
Total	**144**	**100.0**	

Note: 6 missing cases

The respondents were also asked whether they would be keen to know more about SPDSS, to which 94% responded positively (refer Figure 5). Many preferred intellectual discourse programmes (i.e. training, seminar, conference and workshop) conducted at national level as the avenues for them to learn more about SPDSS (refer Table 5 and Table 6).

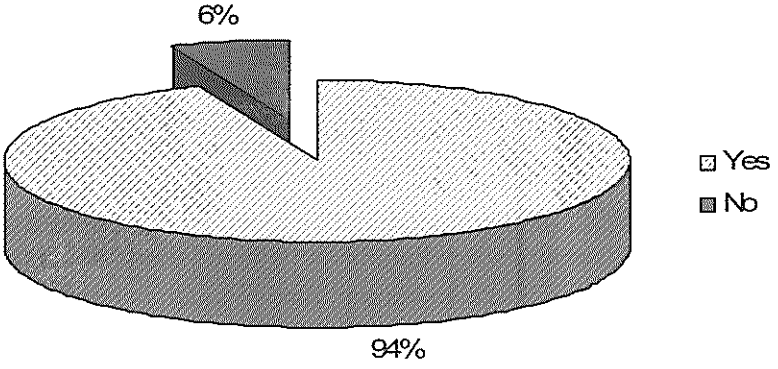

Figure 5: Keen to know more about SPDSS

Table 5: Avenues for learning SPDSS

Area	Count	% of responses	% of cases
Seminar	35	22.2	45.5
Training	53	33.5	68.8
Conference	17	10.8	22.1
Workshop	34	21.5	44.2
Discourse	18	11.4	23.4
On the job	1	0.6	1.3
Total	**158**	**100.0**	

Note: 4 missing cases; 77 valid cases

Table 6: Level of avenues for learning SPDSS

Level of avenues	Count	% of responses	% of cases
International	21	22.6	28.0
National	70	75.3	93.3
Local (departmental)	2	2.2	2.7
Total	**93**	**100.0**	

Note: 6 missing cases; 75 valid cases

In terms of level of SPDSS training, 61% of the respondents preferred executive level of training as compared to technical level (refer Figure 6). This is perfectly understandable given the level of SPDSS understanding which is rather low among the respondents. An executive level of training would normally expose the trainees to the fundamentals and theories behind the subject matter (in this case SPDSS) without going into the nitty-gritty of how to actually operationalise the subject matter. To the respondents, this would be a far more sensible start to better understand SPDSS.

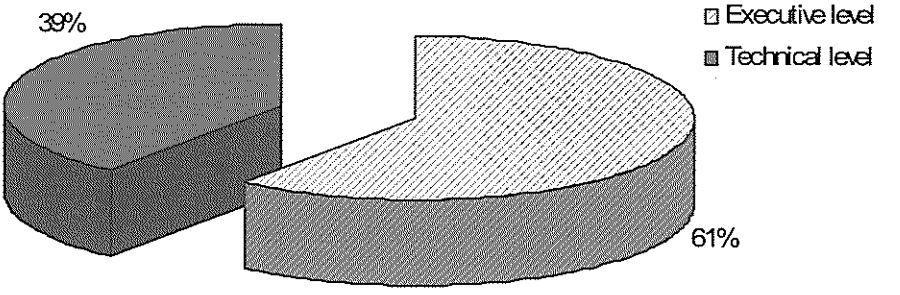

Figure 6: Preferred level of SPDSS training

It is interesting to note that the most demand for technical level of training came from respondents from the local authorities and the private planning firms (refer Table 7). These are the people who would need to operate SPDSS on the ground and thus in need of the technical know-how of SPDSS operation.

Table 7: Cross tabulation between level of SPDSS training and nature of respondent's organisation

Level of training	Nature of respondent's organisation							Total
	Federal dept	State dept	Local authority	Semi-govt	NGO	Private firm	Education	
Executive	6	7	15	1	1	18	9	57
Technical	2	3	13	2	0	15	2	37
Total	**8**	**10**	**28**	**3**	**1**	**33**	**11**	**94**

As aforementioned, majority of respondents were keen to know more about SPDSS (refer Figure 5). Thus, many were willing to attend a two-to three-day intellectual discourse programmes (i.e. seminar, training, workshop and conference) on SPDSS (refer Table 8) and were also willing to spend in the region of RM300-RM1,000 for attending those programmes (refer Table 9). However, the amount of money they were willing to spend corresponds with the

duration of programmes. Those who were willing to spend higher amount of money (RM500-RM1,000) also preferred a longer duration (five days to one week) of intellectual discourse programmes.

Table 8: Preferred duration of intellectual discourse programme

No. of day	Seminar	Training	Workshop	Conference	Total
1	5		1	1	7
2	15	13	8	5	41
3	7	13	5	5	30
4		2	1		3
5	2	7	3	2	14
> 1 week	1	6	3	2	12

Table 9: Preferred duration of intellectual discourse programme

RM	Seminar	Training	Workshop	Conference	Total
< 300	12	10	10	7	39
301-500	11	17	8	5	41
501-1000	7	14	5	5	31
> 1000	3	4	2	3	12

WEALTH OF SPDSS INFORMATION

As aforementioned, SPDSS is relatively new in Malaysia, thus, the availability of information pertaining to it might still be insufficient, to say the least. When asked, many respondents (52%) concurred with this statement (refer Table 13). For those respondents who said they have requested information on SPDSS, only 13% have managed to fully obtain the requested information (Table 14). This further proves that there is insufficient wealth of SPDSS in the country at the moment.

Table 13: Wealth of SPDSS information

Level of response	Frequency	%	Valid %	Cumulative %
Very sufficient	2	2.5	2.6	2.6
Sufficient	16	19.8	20.8	23.4
Insufficient	40	49.4	51.9	75.3
Do not know	19	23.5	24.7	100.0
Total	77	95.1	100.0	
Missing	4	4.9		
Total N	**81**	**100.0**		

Table 14: Amount of requested information obtained

Level of response	Frequency	%	Valid %	Cumulative %
Fully	3	3.7	12.5	12.5
Partially	13	16.0	54.2	66.7
None	8	9.9	33.3	100.0
Total	24	29.6	100.0	
Missing	57	70.4		
Total N	**81**	**100.0**		

The issue of availability of SPDSS information (or the lack of it) is not difficult to comprehend. For one, SPDSS is still new to many town planners in Malaysia. Secondly, the local knowledge base is presently quite limited. There are not many local SPDSS experts and formal SPDSS courses are even more limited. Looking at the curriculum of planning schools in Malaysia, a SPDSS specific subject is only being taught at the Department of Urban & Regional Planning, International Islamic University Malaysia (IIUM). Other planning schools in the country are concentrating more towards GIS-related subjects (refer Table 15).

Table 15: ICT related subjects offered in Malaysian planning schools

University	Programme /Study Duration	Subject Offered	Credit Hours/ Subject
International Islamic University Malaysia	1+4 years	1. Introduction to Computer [1] 2. CAD-2D [1] 3. CAD-3D [1] 4. GIS Application for Built Environment [1] 5. PDSS [1] 6. Photogrammetry and Remote Sensing [1]	2 2 3 3 2 2 14
Universiti Teknologi Mara	3+2 years	1. Computer Application[1] 2. Computer Aided Design [1] 3. GIS Application [1] 4. Modelling and Techniques [1]	3 3 2 2 10
Universiti Teknologi Malaysia	5 years	1. CAD [1] 2. Quantitative Techniques & Computer [1] 3. GIS in Planning [1] 4. GIS for Local Authority [2] 5. Remote Sensing and GIS Application for Local Authority [2]	5♦ 3 3 4 4

		6. GIS and Environmental Management [3] 7. GIS Application and Implementation [3]	19 3 3
Universiti Sains Malaysia	3+2 years	1. Computer Applications in Planning [3] 2. Planning Analysis and Methods [3]	3 3 6

Note: 1. Compulsory courses; 2. Elective courses; 3. Post-graduate level
** MSc (2 years); ♦ Taught and applied in studio*
Source: Mansor Ibrahim et al. (2004).

SPDSS PROMOTION INITIATIVES

In an effort to promote SPDSS among town planners in Malaysia, as well as to enlarge SPDSS knowledge base in the country, the Department of Urban and Regional Planning, IIUM has entered into a collaborative SPDSS network with three foreign universities. They are:

- International Institute for Geo-information and Earth Observation (ITC), Enschede, The Netherlands;
- Università degli Studi di Trento, Italy; and
- University of the Philippines Diliman, Manila, Philippines.

The network, entitled 'Expanding Expertise Network for generating and sharing knowledge related to Spatial Planning and Decision Support' (ENSPADS), is funded largely through the ASEAN-EU University Network Programme (AUNP) and expected to be carried out over a period of two years which begun in January 2004.

The network centres on the development of SPDSS course concepts and course materials through a joint effort of all partners. It is hoped that this will improve the curriculum development capacity of each of the partners. Several workshops will be conducted throughout the project period. Experiences gained during the implementation of the workshops and joint courses will strongly contribute to the technical capacity of the staff involved, while facilitates exchange of best practices as well.

Besides the research team which consists largely of academic staffs from the Department of Urban and Regional Planning and one staff from the Department of Business Administration of IIUM, a steering committee has also been formed. The committee members consist of selected people from the planning practice and also from relevant government agencies including FDTCP,

Malaysian Centre for Remote Sensing (MACRES), Ministry of Federal Territory and the private planning firms. The main task of the steering committee is to provide inputs to the IIUM research team on the need for SPDSS both in the market and also in the government agencies.

CONCLUDING REMARKS

This paper has demonstrated that despite the unsatisfactory level of understanding of SPDSS among town planners in Malaysia, there is a significant interest among them to understand SPDSS, learn what it is all about and apply it in their work. However, at present, the availability of information regarding SPDSS is rather limited in Malaysia. Efforts need to be made by the relevant parties, especially those in the academic circle, in enhancing SPDSS knowledge base in the country. SPDSS network must be developed not only at international level, but possibly at local level as well to further promote SPDSS in Malaysian planning.

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