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ELECTRONIC LOCAL AUTHORITY MANAGEMENT SYSTEM

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Abstract

One of the most important functions of a local authority in Malaysia is development control under the Town and Country Planning Act, 1976 (Act 172) and the Street, Drainage and Building Act, 1974 (Act 133). With the powers under these acts, the local authority is responsible to ensure that any activity of development is carried out in an orderly manner so as not to cause immediate as well as long-term undesirable impacts on the neighbours, the surroundings and the environment. To do this the law requires that any person intending to carry out any development will need a planning permission and a building plan approval from the local authority. In giving such an approval the local authority has to check and ensure that the developer can and will carry out the development properly and according to a good set of by-laws, standards, regulations and guidelines drawn up to protect the safety, health and amenity of the people in the local authority area. However most local authorities, due to numerous valid reasons, have problems carrying out this task and are often accused of causing delays to the development process and hence to the economic progress of the country. Often, justly or unjustly, local authority officers and decision-makers have been branded as not transparent and corrupt for taking such a confusing and lengthy process in considering applications for development approval. Local authorities have hence an almost impossible task of protecting the environment and ensuring sustainable development and at the same time promoting further development and timely economic growth. In an attempt to overcome this problem the Municipal Council of Penang Island (MCPI), with grants from the Development Application Grant Scheme (DAGS) of the National IT Council (NITC) of Malaysia, embarked on a project to develop an Electronic Local Authority Management System, or "eLAMS". This will assist in the day-to-day functions of processing and considering of applications for planning permission, building plans and earthworks plans, in accordance with a good quality management and environmental management system.

This paper examines the problems of the development control process for sustainable development and the problems of adopting and adapting the electronic system faced by local authorities in Malaysia in general and the Municipal Council of Penang Island in particular. This paper will also outline the proposals to overcome these problems with eLAMS.

Keywords: eLAMS, GIS, CAD, DAGS, Development Control, PEGIS

INTRODUCTION

The government's task of protecting the environment, abating nuisance and hazardous situations, and ensuring sanitary conditions has been inherent since the formulation of the health and housing laws of England. There were later adopted and adapted for the running of the local government areas of Malaysia (then Malaya), in the form of the earlier Municipal Ordinances and the Town Boards Enactments. In later years, these ordinance and enactments were replaced by the Local Government Act (1971), The Street, Drainage and Building Act (1974), and the Town and Country Planning Act (1976), which together, provided local governments of Malaysia the powers and responsibilities to ensure a safe, healthy and enjoyable environment for the people. The task is made more crucial with Malaysia's commitment in the global thrust towards sustainable development. The local authority has an important role to play in ensuring sustainable development in its area. Under these acts, it is the key player in the planning and control of development by private individuals carrying out activities that may have immediate as well as long-term impacts on the neighbours and the environment. Be it the construction of a house, the felling of trees, the cutting of hills, or the operation of a polluting industry. Under the Town and Country Planning Act (1976), any person who intends to carry out any form of development has to obtain approval in the form of a planning permission from the local authority. The Act's definition of "development" is very wide and covers the erection or demolition of a building or structure, cutting of land, and change of land or building use. The Act even requires approval for the felling of trees. Under the Street, Drainage and Building Act (1974), approval of the local authority is required for the erection of buildings, the construction of streets and drains, and carrying out of earthworks, while under the Local Government Act (1971), the local authority controls and supervises, by licensing, the carrying out of any trades, businesses or industries, that can be a source of nuisance.

Although the local authorities have adequate powers under Malaysian laws to ensure good and sustainable development through the development control process, the task is not an easy one. There are numerous valid reasons for this and the process is filled with inherent problems, ranging from the tediousness of the process, which is worsened by the perennial shortage of manpower situation, to the difficulties of rejecting applications, which is worsened by the political factor in a democratic society.

Malaysia has embarked on the path towards computerization a long time ago. However, the central government's thrust into the ICT world was launched with the formation of the National IT Council (NITC) and the establishment of the

Multimedia Super Corridor (MSC) with the smart cities of Putrajaya and Cyberjaya. This thrust is filtered to the states with Penang formulating its Penang K-ICT Blueprint. As expressed in the National IT Agenda launched by the NITC in 1996, this is to provide "the foundation and framework for the utilization of information and communication technology to transform Malaysia into a developed nation in our own mould consistent with vision 2020" and "to transform all Malaysian society into an information society, then to a knowledge society and finally to a values-based knowledge society".

It is with this premise and with the hypothesis that with ICT, some, if not most, of the inherent problems in utilizing development control to achieve sustainable development can be overcome, that a grant was successfully applied for by the Municipal Council of Penang Island as promoter and YES Enviro Management Sdn Bhd as the technology partner, from NITC under their Demonstration Application Grant Scheme (DAGS) programme. This grant is to undertake a pilot Electronic Local Authority Management System, or eLAMS for short.

SUSTAINABLE DEVELOPMENT AND THE LOCAL AUTHORITY'S ROLE

The intentions of the laws empowering the local authority to regulate and control development are based on the possibility that the process of development and use of land by an individual, especially in an urbanized setting, will more often than not result in some form of negative impact on and loss of amenity in the immediate surroundings. These impacts may accumulate to cause major environmental, as well as social and economic, damages in a larger area in the long term. The local authority, being the government authority closest to the ground and closest to the people is hence given the responsibility of controlling such activities so that such negative impacts are prevented or at least reduced to an acceptable level. The concept of "acceptable levels" however is still very subjective and various concerned bodies and agencies are hard at work in coming up with suitable and appropriate standards, indicators, targets, objectives and goals for acceptable conditions of living for the people.

The concept of sustainable development has been around for decades and Malaysia has been committed to its achievement since the Rio Summit. Basically, it is the idea of ensuring a better life for everyone, now and for generations to come. A widely used international definition is "development which meets the needs of the present without compromising the ability of future generations to meet their own needs". Among the common objectives of sustainable development are effective protection of the environment, prudent

use of natural resources, social progress which recognizes the needs of everyone, and maintenance of a high and stable levels of economic growth and employment. The guiding principles to the achievement of these objectives include:

- Putting people at the centre
- Taking a long term perspective
- Taking account of costs and benefits
- Creating an open and supportive economic system
- Combating poverty and social exclusion
- Respecting environmental limits
- Observing the precautionary principle
- Using scientific knowledge
- Transparency, information, participation and access to justice
- Making the polluter pay

(Sustainable Development, the UK Approach)

Land development is an essential strategy to achieve the economic, social and some of the environmental objectives of sustainable development. The participation of private individuals and developers in land development is just as crucial as that of the public sector and is to be encouraged and facilitated. On the other hand, without any form of control, the activities of land development can cause environmental pollution, nuisance, wasting of resources and irreparable damage to the surrounding areas. Traffic congestion, air, noise and water pollution, flooding, land slides, loss of open spaces and green areas, and damage to natural and cultural heritage are some of the complaints often heard. Development control is hence an important and crucial means of achieving sustainable development. However, development control, or any form of government control, restricts the aspirations of the individual in his economic pursuits. The private sector will only be involved in land development if it sees it as economically viable. The imposition of requirements and conditions on development activities will mean that the developer has to incur more costs, which may discourage him from undertaking the development project. The local authority in its consideration of applications for development has to play a difficult balancing act, between important of guidelines and conditions, and encouraging development.

THE DEVELOPMENT CONTROL SYSTEM IN MALAYSIA

Part VI of the Town and Country Planning Act 1976, (TCPA), which applies to all the states and local authorities of Peninsula Malaysia, (except the City of

Kuala Lumpur and all the other Federal territories), states that "*no person, other than a local authority, shall commence, undertake or carry out any development unless planning permission in respect of the development has been granted to him*". The act further states that the application for planning permission in respect of any development is to be made to the local planning authority (i.e. the local authority) who shall, after consideration of the application for proposed development, grant, with conditions if necessary, or refuse to grant planning permission. "Development" is defined under the TCPA as "*the carrying out of any building, engineering, mining, industrial, or other similar operation in, on, over, or under land, the making of any material change in the use of any land or building or any part thereof, or the subdivision or amalgamation of lands*". Hence, it can be seen that the definition of "development" is very wide.

Building control is further covered under the Street, Drainage and Building Act 1974, (SDBA). Section 70(1) of the SDBA states that "*No person shall erect any building without the prior written permission of the local authority*". A person in his application for approval for the erection of a building has to submit a detailed building plan to the local authority for approval and the main matters that are controlled and regulated are matters ensuring safety of foundation and structures, standards of size and space, health and sanitation, as well as building set-back, height, class, type and design.

Under section 70A (1) of the SDBA, "*No person shall commence or carry out or permit to be commenced or carried out any earthworks without having first submitted to the local authority, plans and specifications in respect of the earthworks, and obtained the approval of the local authority thereto*" and section 70 A(5) furthers states that "*In granting the approval under section (1) the local authority may impose such conditions as it deems fit*". Section 70(18) defines "earthworks" to include "*any act of excavation, leveling, filling with any material, piling, the construction of foundations, or felling of trees, on any land, or any act of dealing with or disturbing any land*". Earthworks can cause immeasurable and irreparable environmental disasters if not controlled properly and this provision gives the power and responsibility to the local authority to control and regulate all earthworks activities in its area.

The procedures and format for the submission and processing of applications for planning permission, building and earthworks plans approval are guided by the requirements of the Acts, the planning control rules, the building by-law, the earthworks by-laws, and guidelines and policies adopted by the local authority. Although the main procedures are similar amongst the various local authorities in the country, there are certain steps that may differ due to historical or cultural differences or different interpretation of the laws. A clear understanding of these

procedures and their problems is necessary in examining whether computerization can be effective in overcoming these problems.

In general, the steps toward obtaining planning permission are as follows:

i) The application in the prescribed form is submitted by the applicant through an agent who is "qualified person accompanied by several documents. These include the layout plan of the proposed development (up to as many as 15 copies maybe required), and the "Development Proposal Report". For major developments, a traffic impact assessment report and an environment impact assessment report are also required to be submitted. For developments in environmentally sensitive areas, e.g., on hill lands and reclaimed lands, a geotechnical report will be required as well.

ii) The layout plan is referred to several technical departments for checking, which usually include the town planning, building, engineering, health and licensing departments of the local authority, the state public works department, drainage department, the utility departments such as the electricity supply department, the water supply department, the telecoms company and the sewerage management agency, and the department of the environment. Other departments, such as the education department and the police department may be referred where relevant. These departments will have their standard requirements and guidelines, which will be imposed on the proposed development.

iii) The agent will then have to amend the layout plan or change the development proposal to comply with the technical requirements and comments and to resubmit the layout plan.

iv) The amended plan will be referred to the technical departments again for a second round checking.

v) A notice is sent to neighbouring landowners informing them of the proposed development and to give them an opportunity to object, if they think necessary. If written objections are received then the objectors are invited to be heard by a committee of the local authority.

vi) The application for the proposed development will then be tabled to the relevant committee of the local authority, together with the objections for approval or rejection.

vii) The Act also has provision for the applicant, whose application for planning permission has been rejected by the local authority, to appeal

to an Appeal Board, whose chairman and members are appointed by the State Authority.

Some major local authorities have obtained the ISO 9002 certification for these procedures and format, as well as those for approving of building plans and earthwork plans.

The day-to-day processing of the applications by the various technical departments is aided by policies, plans, manuals and guidelines that each department has compiled through the years. Local authorities are also required, under the Town and Country Planning Act (1976), to prepare Structure Plans and Local Plans. (Under a recent amendment to the act (Act 1129), State Structure Plans are now prepared by the Director of the State Town and Country Planning Department). In the consideration of applications for development, the local authority has to make sure that the proposed development will comply with the structure and local plans. Structure plans are policy plans and its proposals are broad and general and hence do not offer a clear or precise guidance. Local plans are map based and more detailed and are used to regulate and guide development in the consideration for planning permission. This is especially in terms of whether the proposed development and land use can be allowed or not in that area. If allowed, to what extent and scale in terms of density or plot ratio, height, setback, type and design of buildings, drainage and street layout, extent of land cutting and tree felling, provision of open space, community facilities, car parking, landscaping and even provision of low cost housing for the poor.

In the absence of local plans, as is the case in many local authority areas, the local authorities will have to rely on a series of guide plans and guidelines that have been formulated in various other ways. Some of these are plans that were adopted under the Town Boards Enactment, which is now superceded by the TCPA, while some have been prepared and used by the local authorities administratively as and when required throughout the years. A common guide plan is what is often called the land use zoning plan, which shows the type or class of land use that can be allowed in the different zones of the plan area. This is with the assumption, which may or may not be correct, that development or activities of the same class in the same area, (what is called compatible uses), will not cause nuisance or intolerable environmental pollution in the area. The preparation and use of these guide plans are sometimes not in accordance with the provisions of law and are often challenged by developers. This is especially so when their applications have been turned down based on these guide plans and they appeal to the Appeal Board.

The present system of development control has been much criticized by all concerned. The most vocal of these are, of course, the developers who cannot tolerate the slowness of the process. Being business people, to them time is money. They are not happy with the uncertainty and inconsistency of the requirements, the procedure and the long period. It is a common practice for developers to lobby officers in order for their applications to be processed faster (a maneuver called "plan chasing") and to lobby the councilors and other political decision-makers so that their applications are considered more favourably.

The agents and consultants find the requirements of the procedures and guidelines confusing and time consuming and sometimes conflicting, especially when there are so many departments involved. There are too many copies of the layout plans, (from 8 to 15 copies), building plans and reports to submit. The procedures and requirements are often different from state to state and for one local authority to another, and often change with time and personnel. The consultants find great difficulty in advising their developer clients correctly. The adoption of ISO 9002 was to document, clarify and make consistent all the steps in the process, but it has led to more red tape and inflexibility.

The officers of the local authorities and the other government departments find the process tedious. There are too much paper work, such as letters to draft, type and send, too many thick reports and bulky plans to read, papers and reports to prepare, type, print and circulate. The plans are bulky and heavy, and difficult to carry around, and occupy a lot of space on the desks and shelves. Even folding the large plans takes up much time and effort. There are too many departments to deal with and many meetings to attend, and communication with the applicant, the agent, the departments and the objectors through the mail or by hand are time consuming and uncertain. This is being aided with informal telephone calls and faxes, although officially all correspondences are to be by hand, or by mail or registered mail. Data sharing among departments are difficult and uncommon, and each department, and even each unit within the same department, has to compile its own records of applications for its own use. These issues are not insurmountable in the old days as the number of applications submitted was not large. Even then, the manual procedure is so dependent on the handful of long serving staff and their power of memory in order to remember where the files are and how to retrieve them. Crisis situations have arisen when the staff are on leave, or worse, resigned or retired or are transferred. However, the number of applications for development approval has been increasing throughout the years, especially in the more urbanized local authority areas. This has occurred without the corresponding increase of staff and office space and the problems have multiplied.

The councilors and other decision makers have a difficult time reading, understanding and evaluating the development proposals and the control guidelines, guide plans, layout plans and reports, and often decisions are made without understanding the implication and impact of the proposed development.

Last but not least, the neighbours, the public at large, as well as the people who will be occupying the development and those who will be affected by it are often not aware of the proposed development and the full implication of its impact until after the fact. The law requires that only the immediate neighbours are informed of the proposed development by the approving authority and given the opportunity to object, notwithstanding the fact that the impact of any development may affect the inhabitants of a much larger area.

Besides the logistics of the situation and the inefficiency of the process, a more important question is whether the procedures practiced by the local authorities in carrying out their development control functions are effective in controlling environmental degradation and achieving sustainable development, as well as creating a safe, healthy and enjoyable environment for the people. As mentioned earlier; local authorities are more concerned on achieving a shorter time frame for the processing and approval of applications for planning permission, building plans, earthwork plans and releasing of certificate of fitness, then on ensuring that the development will not have any damaging impact on the environment. Nor are local authorities concerned whether the guiding principles of sustainable development can and will be followed. It is doubtful whether the present development control guidelines adopted by local authorities such as the zoning plans and even the local plans can achieve effectively all the objectives of sustainable development even if the development proposals can "comply" with these guide plans and approval is given. There are many cases where development is approved based on its compliance with the zoning plan, guidelines, by-laws and the requirements of the geotechnical report, and all other technical requirements. Still complaints and objections are raised by the surrounding residents to the noise, nuisance, inconvenience, and fear of land instability created during construction. The municipal council is hard pressed to settle the problem. For one, the people have always claimed, quite rightly, that the principle of transparency and information participation is missing, or insufficient in the approval process.
The main problem lies in the subjectiveness and the difficulty in evaluating and assessing the attributes, criteria, standards or indicators of a "good development". This is against those of a "bad development". These are never clearly spelt out precisely and comprehensively in the "guidelines". Adding to the complexity, criteria and standards are different under different situations, amongst different parties and in different times. The formulation of a good set,

or sets, of standards, criteria, or indicators will be essential to guide the developers in planning and preparing their development plans, the consultants to advise the developers, the public to assess the development and the officers and decision makers in local authorities and other government departments to process, evaluate, recommend and approve or reject development applications.

THE USE OF ICT IN DEVELOPMENT CONTROL AND PLANNING IN LOCAL AUTHORTIES & OTHER GOVERNMENT DEPARTMENTS

Many local authorities and other government departments in Malaysia, especially the larger ones, have been using computers for a long time in many areas of its work, particularly in pay roll, financial accounting, and personnel records. Other main areas include property records and filing records. More recently, some of the local authorities and other government departments and consultants have gone into using computers to aid in the preparation and printing of plans and drawings using computer aided design (CAD) software and now most layout plans, building plans and earthworks plans submitted to the local authorities are electronically drawn. Where it took weeks to prepare and amend plans before, now it only take days and even hours. Besides CAD, some local authorities, including Penang Island Municipal Council, are using Geographical Information System (GIS) software to draw, reproduce, and store plans and to manage their map-based information and records. The Town Planning Department of the Penang Island Municipal Council has replaced the hand painted land use-zoning plan with a digital version. The old paper-based land use-zoning plan covers the whole island of Penang and at a scale of 1 inch to 8 chains (1 chain is 66 feet), takes up a space of 12 feet by 15 feet, and it took 4 draughts men more than a month to reproduce a copy of the plan by hand and for each copy to be checked thoroughly. Even then, only 2 copies could be produced as there were so many mistakes in the third copy that it could not be used. For the digital version the cadastral base-map of Penang Island were digitized from the 1 inch to 4 chain cadastral sheets available. (Now the Department of Survey and Mapping of Penang has a digital version of the cadastral map of Penang Island using coordinates). This work was outsourced in a pilot GIS project in 1996 to the School of Housing, Building and Planning, of the University of Science Malaysia in Penang, which was at that time setting up its GIS centre. Besides the cadastral map, which shows the lot boundaries (with lot numbers) and the coloured land use zones, the pilot GIS project has completed the digitization of rivers, roads (with road names), existing land uses, building footprints (with address numbers), and an inventory of heritage buildings (with photos and other information) for Penang Island.

Of greater importance, the technicians of the department have been adequately trained to carry on with the digitizing work and to continuously update the cadastral maps and other data as well as to input other information such as the development pressure map, which shows the layout and data of all development applied for and approved. This information is at the moment separately stored in the PC's but the department has bought the server software to link and share these GIS information internally and later on externally via the internet. The department is also now developing a second prototype of a planning permission application processing system to electronically register, monitor, prepare and send standard letters, vet the application, prepare the papers for the planning committee, compile and analyze data on development proposals and approvals, etc. The first prototype was not very user friendly and difficult to use and was abandoned. The system is at the moment developed internally using Microsoft Access as this is easier for the department's officers, this can be changed to bigger database management system such as Oracle when the time comes.

Other departments and local authorities are also in the various phases of ICT and GIS development and are having various degrees of success. The Penang State Government has successfully set up the Penang GIS, or PEGIS, with map based data compiled from various departments and is in the initial stage of dissipating data among the departments and to the public via its website. The State of Selangor has a similar system called SGIS, which involves the computerization of land administration data of the land office. Besides the Federal and State Land and Mining Departments and the Survey and Mapping Department which have embarked on a nation wide effort to computerize their procedures and data recording and mapping systems, the Federal Department of Town and Country Planning is encouraging and facilitating their state and regional offices to computerize as well. The Town and Country Planning Department of Selangor has started on SEPAS (Selangor Electronic Planning Approval System). The Perak Town and Country Planning Department is spearheading the Perak state government's ICT programme, and other state and region Town and Country Planning Departments are using ICT and GIS in their local plan preparation work. Perbadanan Putrajaya is using a system called SUMBER-PUTRA, short for "*Sistem Pengurusan Berkomputer Pembangunan Bandar Putrajaya*" or "*Putrajaya Computerized Urban Development Management System*" including an e-submission system for planning application. The Malaysian Centre for Geospatial Data Infrastructure, (MacGDI), under the Ministry of Land and Co-operative Development of Malaysia has set up the Malaysian Geospatial Data Infrastructure (MyGDI) (formerly called the National Infrastructure for Land Information System, or NaLIS) to provide access to geospatial data through sharing among participating government agencies for more improved planning and development of land

resources. Its main objective is to enable online access to geospatial information, to avoid duplication of effort in data collection and to ensure accuracy, timeliness, correctness and consistency of data used in planning, development and management of land resources. In Malaysia, several universities are also involved in teaching, research and carrying out of projects in computerized land planning and management systems, the main players being Universiti Teknologi Malaysia (UTM), Universiti Sains Malaysia (USM), Universiti Technologi MARA (UiTM), International Islamic University Malaysia (IIUM) and Universiti Putra Malaysia (UPM).

The progress in ICT development in land use planning and management in the government agencies is not without difficulties and problems. Many pilot projects have failed, some at tremendous costs. Those that have achieved some form of success are still at various stages of completion. The reasons for the failures are many and some have been discussed by Lee, and others (1996).

A major problem in computerizing the manual development control procedures being practiced in local authorities is that the present practices and formats are not clear or systematic and are sometimes outdated. Some of the formats have been inherited from the days of the Municipal Ordinance, the Town Boards Enactment and the old by-laws and have been adopted throughout the years on an ad hoc basis. They do not reflect the present requirements but have been carried on for fear of change on the part of the present officers. The fear of change has often been cited as an obstacle to ICT development in government departments. Some officers were even reluctant to change to the electronic typewriter, not to mention the word processor or personal computer, after having used the "reliable" manual typewriter for so long. Apart from, and related to, this, some officers at the various levels are unfamiliar with the electronic technology and hence are unable to see how it can help in their work or how to state clearly and precisely to IT consultants and vendors the nature of their needs.

The IT consultants on the other hand are unable to understand completely the formats and procedures of the development control process as practiced by the local authorities or as required, and are hence, unable to obtain and develop the appropriate IT system for their day-to-day work. To make the task more difficult, the development of an IT system for development control and land use planning is not similar to the computerization of other straight-forward procedures that most IT consultants and vendors are familiar with, or have experience in, like those for financial accounting, personnel records, supermarket entries, banking systems, etc.

The development control process is definitely more complicated. For one, there is an element of decision making at various stages in the process of development control, be it at the town planning assistants' level, checking the development application to make sure it is in order and can comply with the technical and other requirements, at the level of the town planning officers, who have to evaluate the proposed development to ensure that it will not be a cause of environmental and other problems and to make appropriate recommendations to the planning committee, and at the committee level which makes the final decision on whether the application can and should be approved or not, taking into consideration political factors besides the technical factors.

Shortage of funds to buy hardware and software are often cited as a cause for the failure of government agencies to computerize. However, in many cases, it is the impatient and imprudent jumping into the ICT bandwagon without adequate and in depth understanding and planning that has caused the failures. With the directive by the federal government and the eagerness on the part of the top management to computerize, departments are often tempted to take up whatever are offered by IT consultants and vendors at whatever costs without first studying whether or not the systems are appropriate, workable, or necessary.

Development control information and records are related to spatial attributes or land. Consultants, who are well versed in the existing land documentation and management systems of the land office and the Survey and Mapping Department as well as in GIS, are necessary if the system is to be complete.

eLAMS

The Penang Island Municipal Council's proposed Electronic Local Authority Management System or eLAMS for short, will consist of various computer modules that will be developed progressively to replace the existing manual, paper-based formats in the Council's departments for the processing of applications for planning permission, building plans, earthworks plans, and later on, licenses. Each department will be in charge of the relevant module, e.g. the Town Planning Department will be in charge and responsible to develop and maintain the Planning permission module, the Building Department, the building plan module, the Engineering Department, the earthworks plan module, and the Licensing Department, the licensing module. Each department will be the custodian of its records and data that are compiled in the day-to-day processing of applications, but a centralized data bank will be installed where

all the relevant geospatial information that are common among all departments are stored and shared.

Each module will eventually replace the existing manual paper-based system to:

- receive, check and register each application,
- evaluate the proposed development applied for,
- prepare, print and sent out standard letters,
- prepare the working paper and recommendation for committee meeting,
- make presentation at the committee meeting,
- prepare the minutes of decision,
- prepare, print and send out the certificates of approval or rejection,
- monitor and track the status of the application,
- compile, analyze and prepare reports on the development data and store in the department's data bank to be used later, and in the Council's central data bank to be shared with other departments.

For each stage, a series of checklists of predetermined items will be prepared to guide the processing of the application. A checklist of prerequisites will be used to check the application as soon as it is submitted to make sure it is in order and is accompanied by all the required plans and documents, before the application is accepted and registered. In fact, with the checklist the applicant or agent will be able to ensure that the application will be in order. eLAMS will also have an inbuilt electronic system for e-submission or submission of the plans and documents for the application via the internet. However, this can only be fully implemented when the law allows digital plans and documents to be used for applications and approvals. Until then hard copies of the plans and documents will have to be duly submitted. A situation is envisaged where only one official hard copy need be submitted and the digital plans and documents can be used for circulation and checking by the relevant departments via the electronic net.

To achieve the objectives of sustainable development, a list of criteria and indicators of sustainable development will be needed to aid the officers in the evaluation of the proposed development. The eLAMS pilot project will include the formulation of a suitable and appropriate set of criteria for sustainable development. This will be integrated into an overall environmental management system which will enable the local authority to achieve ISO 14001 certification for its development control function.

The formulation of indicators will rely on the large amount of work that has been done in developing sustainable development indicators by Federal and State government agencies such as the Economic Planning Unit, the Department of Environment and the Town and Country Planning Department; think-tank organizations such as the Institute for Environment and Development of the Universiti Kebangsaan Malaysia (LESTARI) and the Socio-economic and Environment Research Institute of Penang (SERI), and non-government organizations such as the Environmental Protection Society of Malaysia (EPSM) (M. Nordin and A. Hezri). The list of environmental sustainability indicators and criteria is not only to measure and monitor the status of sustainable development in the area, but more importantly, to serve the purpose of ensuring that proposed developments can and will comply with requirements for sustainable development during and after construction. The list will hence include criteria to ensure that the impacts of the various aspects of the proposed development not cause deterioration and damage, and will improve safety and land stability, excessive water runoff and flooding, air and water pollution, traffic impact, noise and other disturbances, flora and fauna, sanitation and utilities, open space, and community facilities, natural and cultural heritage, and aesthetic, landscape and urban form. Based on the electronic system of criteria and indicators, environmental impact and traffic impact assessments can be carried out by the applicant and his consultants themselves even when they are preparing the plans, and by the officers in the local authority, when they are checking the plans. The proposed development can be evaluated more thoroughly before a decision is made on the application, and the development can then be monitored during and after construction to ensure that it achieves the objectives of sustainable development.

A comprehensive format for the development proposals report, the environmental impact assessment report and the traffic impact assessment report will be drawn up and used for submission of applications which are to be checked in accordance with the government's environmental policies and in accordance with ISO 14000 requirements. This will include a system of continuous environmental auditing and reporting on the impacts of the development and operation activities. These reports can be published in the local authority's website to enable the public to evaluate the social commitments undertaken by the developer. The proposed environment accounting will ensure not only greater awareness but also the development of responsible attitude among chief executives. (Lee L.T. 2002).
With eLAMS, information such as names, addresses and other particulars of applicants, agents and landowners, and details of the proposed development are entered only once, that is at the point of registration of the application, and are then stored in the central registry. In fact, this information and the layout plan

can be supplied by the applicant or the agent in a digital copy or via the internet. This information can then be automatically extracted and used by every department when necessary such as when printing and sending out letters or preparing the papers and reports. This saves time and duplication of work. The central data bank will store all information related to proposed, approved and completed developments. These may be analyzed to provide data on the housing and real estate industry in the local authority area. This information can be supplied to PEGIS, MyGDI and the National Property Information Centre (NAPIC), which has been set up by the Valuation and Property Services Department under the Ministry of Finance Malaysia, to collect and collate information related to the property industry from various agencies.

The system also enables the applicants, the agents and the departmental managers to keep track of the status of the applications and monitor them via the internet and intranet, and hence to reduce accusations of delays, uncertainties and inconsistencies in the development control procedure in local authorities. Development information can also be made available to the public via the website.

eLAMS is also to facilitate local authorities to obtain certifications for ISO 14000 for environmental management as well as ISO 9001:2000 for quality management, not only for the development control process, but with later modules for other functions and services as well, such as licensing, project management, property management, and property assessment.

The eLAMS pilot project has been mooted with the conviction that ICT can be an invaluable tool to improve the efficiency of local authorities in its difficult task of development control as well as in other functions. The digital system requires less paper and paperwork, less working and storage space, easier reproducing and printing of papers and plans, easier retrieval and sharing of files and information, easier data calculation and analysis and preparation of reports, no duplication of data recording and compilation, easier communication and sending of letters, files and plans, and time saving processes. With the clear guidelines and format, the applicants and agents can help in the work by being made responsible to enter the data properly and provide all the relevant information for faster processing of the applications. There is more consistency and greater transparency and the applicants, developers and consultants as well as officers and management can monitor the progress of the applications.
The system is also to enable the officers and councilors of the local authority, as well as the developer, the consultants and the public, to evaluate and monitor the proposed development in a more effective, clear and responsible manner,

and to ensure that the environmental policy and the principles of sustainable development can and will be complied with.
It will also gradually and progressively build up a comprehensive data bank of geospatial data of the local authority area, which will be invaluable in the evaluation of its environmental quality and service quality and for its future planning.

However, it is still a long way before the eLAMS is successfully and effectively set up for the Penang Island Municipal Council. Work has started with the grant from NITC under its DAGS scheme, by the technology partner, YES Enviro Management Sdn. Bhd, who is responsible for the ICT support system, and the content partner, Institute Alam Sekitar Malaysia, who is formulating the quality and environmental management systems. An in-house team of relevant officers from the town planning, building, engineering and IT departments of the municipal council will have to work hand-in-hand with the consultants. The officers will provide input as to the desired working procedures and other needs of the departments. It is fortunate that the council has documented its development control procedures and obtained ISO 9002:1994 certification. This will ease the documentation process of the pilot project, but ISO 9002:1994 has been discontinued.

The pilot project aims to achieve the new ISO 9001:2000 certification for the council. The team has to evaluate the available software to ensure that the selected software is suitable and workable for its long-term needs. Many ICT pilot projects have failed due to the use of unsuitable software that were promoted by consultants or vendors. The team can learn from the experiences, good or bad, of other government agencies that have gone down this path before and should not work in isolation. There is still a long learning process, but the selected officers have to have high enthusiasm, motivation, and conviction. Education, skills and experience have to be obtained by continuous self-learning, training and practice. The setting up and training of the in-house team for the pilot project is crucial for the long term success of the project as the team of officers will have to continue to maintain and develop the system and to train other staff to run the system after the pilot project. With a long term, comprehensive ICT system in mind, eLAMS can be developed module by module, sub module by sub module, in a gradual, incremental, step-by-step approach. With commitment from top management and appropriate motivation, incentives and training given to the heads of department, mid level and lower level officers, the local authority can gradually acquire the necessary skills and experiences for its own staff to carry on with the day-to-day maintenance of the system and also to regularly develop the system further with the help of external consultants only when and where necessary.

Before such an electronic system can be fully functional and adopted, however, all the bugs frequently related to computer systems have to be ironed out as far as possible during the pilot project period. These are not only related to the problems of viruses, but also problems related to security, custodianship of information, mode of payment, and other house keeping problems like ensuring that colours and inks of the hard copies of reports and plans are water proof and long lasting and will not fade with time. We are all still used to the past system where drawings and plans were hand drawn and painted with Indian ink and town planning colours, which have lasted for over a hundred years. It will be disastrous if the hard copies of plans and the digital copies in the hard discs and CD's are destroyed with viruses and fungus.

CONCLUSION

Local authorities play an important role in the development control process. They are responsible to ensure that developers can and will carry out their development in an orderly and responsible manner so that "*it meets the needs of the present without compromising the ability of the future generations to meet their own needs.*" At the same time, local authorities must not be seen to be obstacles to economic growth by delaying the approval process. They have also to keep up their image of caring for the people and be transparent in their procedures. The Penang Island Municipal Council's proposed eLAMS pilot project aims to set up an ICT system which will increase the efficiency of the day-to-day work of the local authority in the processing of applications for planning permission, building plans and earthworks plans. The progressive system provides for subsequent modules to be developed and incorporated, such as for the processing of applications of licensing, property management, project management and property assessment.

A centralized data bank of geospatial information will be part of the system, which will be made available via the net to relevant departments, developers, consultants and the public. ELAMS incorporates an environmental management system as well as a quality management system in accordance with ISO 14000 and ISO 9001:2000 requirements, which will include a procedure for environmental impact assessment, auditing and reporting. It is hoped that these efforts will not only promote the development of a "values-based knowledge society" with greater awareness and participation, but also develop greater responsibility and accountability among developers, entrepreneurs, professionals and the public in protecting the environment.

The Penang Island Municipal Council can benefit tremendously by learning from the experiences of the many departments and agencies that have gone into computerization of their land management, planning and development procedures. It has to build up its own core of motivated and well-trained officers for the job and not to rely entirely on external consultants and vendors.

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