Development Control System and GIS for Local Authority in Malaysia: A Case of Kuala Lumpur City Hall

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ABSTRACT

This paper examines the functions of local authority particularly in the context of planning and development control. The process of development control involves a technique for the systematic compilation of expert quantitative analysis and qualitative assessment of a project's land use and development viability, including its effect on the surrounding area, and the presentation of results in a way which enables the importance of the predicted results, and the scope for modifying or mitigating them, to be properly evaluated by the relevant decision making body before a planning application decision is rendered. Taking Kuala Lumpur as an example this paper will demonstrate the development of database and its application for development and building control. The application indicates that the functionality of GIS can be enhanced, i.e. by adding new model and analytical tools to existing systems and by using the GIS toolkit to best effect. Consequently it will be used to assist decision-making, taking into account among other things, the current scenarios of the proposed development, physical constraint and future impacts.

1 INTRODUCTION

In Malaysia, the current method of planning adopted a continuous, cyclical system approach based on the identification of needs and goals, the formulation and evaluation of alternative courses of actions and monitoring of adopted programs. This is required in light of rapid urbanisation which increases the pressure for intensive development in most major towns in Peninsular Malaysia. The local authority for most major towns faces problems as regard to development control process, namely the inavailability of local plan to guide future development direction thus creating difficulties for decision making process. Given the dynamic nature or urban development, it is particularly important to have a well-conceived information system which can serve as the eyes and ears of planning process. It provides for the monitoring and surveillance of compliance with planning regulations and it serves as early warning system with regard to friction and sources of shortfalls in the process of urban planning and management. Information is therefore needed at local authority level to facilitate administrative procedures, policy planning and plan implementation. Also, the advent of corporate planning and the continued squeeze on local authority expenditure required local authorities to examine critically whether rational decisions are undertaken. This paper demonstrates how development control can be substantially improved by using GIS as one of the main tools of planning (Scholten and Padding, 1990).

2 LOCAL AUTHORITIES FUNCTIONS AND THE USE OF GIS IN MALAYSIA

The Malaysian administrative system is divided into three major levels of hierachy: the Federal Government, State Government and Local Government, the latter being the local authority for its area. In 1976, the Local Government Act 1976 (Act 171) was promulgated providing a consolidated framework for local authorities. It also empowers the authority to undertake a wide range of functions. The planning powers of local authorities were thereof stipulated in the allied Town and Country Planning Act. The act stated that the local authority shall be the local planning authority for the area of the local authority, thus, conferring a primary physical planning responsibility at the local level and not at the state level as previously practiced. To carry out this function, the local authority shall prepare a two-tier development plan for the purpose of organising, controlling and planning the development and use of land and buildings in their area. Strategic or policy decisions are to be incorporated in structure plans while detailed decisions are to be laid out in local plans (Yaakup et al., 1994).

It is clear that development at the local level will involve a lot of policies and implementation decisions which have to consider the cost and benefit to every level of urban dwellers. The interdependency between investments and their environment and the need to integrate all groups of inhabitants in urban society under decent living condition would be the prime concern of urban planners and managers at local level. Given the wide range of activities, over the years, the local authoroties have amassed a huge amount of information. A substantial portion of these information is geographical in nature such as layout of housing schemes, road and drainage system, composition and distribution of population, distribution of land use and so forth. Unfortunately, these data are often inaccessible even to the local administrators. The main reason being the database management system which is based on manual filing system which makes retrieval of information difficult and time consuming. To alleviate the problem, a number of authorities employ computer databased system such as Data Base IV, Filemaker, Statistical Analytical System or Statistical Package for Social Sceientist. While these systems help tremendously in information retrieval and analysis, they do not handle spatial data very well. Thus, jobs assigned to the system are quite limited to routine retrieval (Yaakup et al., 1995).

Given the dynamic nature of planning and management carried out at local level, it is not suprising that the local authorities become one of the largest users of GIS in advanced and developed countries. To date, in Malaysia, only about 10 of the approximately 132 District Councils and 14 Municipalities have invested in GIS. The reluctance of local authorities to accept the challenge to embrace the technology is due mainly to lack of support from the management level, the lack of inhouse expertise with which to make use of the system and the high cost of GIS. On the other hand, the local authorities particularly of major towns, are now faced with increasingly complex urban problems and inevitably urban planners and managers have to come up with better solutions. Of late there have been an enormous improvement in the

price and performance of computer hardware and functionality of software packages, such that a wide range of specific demands for the management, analysis and presentation of data can now be met in a cost-effective manner. A direct consequence of these new oportunities has been the rapid growth in the number of users interested in developing the urban planning and monitoring applications.

3 DEVELOPMENT CONTROL - PROCESS AND PROCEDURE

In the context of urban planning, the present system of development control in most local authorities in Malaysia is by the granting or refusal of planning permission for development. The local authority is empowered to grant or refuse any planning application in its area. The recent amendment to the Town and Country Planning Act requires that certain planning application shall be accompanied by a development proposal report which include a written statement and a plan to (i) describes the present condition of the land to which the application relates; and (ii) describes the proposed development, in particular on how it would be likely to have a significant effect on the built environment (Ali, 1990). In most cases, a development proposal report involves a technique for the systematic compilation of expert quantitative analysis and qualitative assessment of the proposed project's land use and development viability, including its effect on the surrounding area, and the presentation of results in a way which enables the importance of the predicted results, and the scope for modifying or mitigating them, to be properly evaluated by the relevant decision making body before a decision on an application is rendered. Information required for a development proposal report would therefore include the following major aspects:

i status of land and restrictions;
ii land use analysis and intensity of development - this includes land use zoning, population density zoning, height limit, plot ratio, plinth area, predetermined public area;
iii analysis of issues and potential of sites - this includes site location, existing drainage system, topography and slope, existing road system, existing land use, natural features which must be preserved and development potential;
iv analysis of surrounding development - this includes infrastucture, type, intensity and facilities available in the surrounding area;
v the policies of the structure plan and local plan if available.

In addition, a planning proposal report should also observe the planning standards or other policies which may imposed from time to time. The report will then have to be verified by the local authority concerned, in particular by the Planning Division. The report together with other considerations will be used as a basis for making decision.

The actual practice of development control however may differ from one local authority to another depending mainly on the size and status of the authority.

In this study, the local authority of Kuala Lumpur, more commonly known as the Kuala Lumpur City Hall is chosen as the case study.

4 DEVELOPMENT CONTROL IN KUALA LUMPUR CITY HALL

Kuala Lumpur, the capital of Malaysia forms the centre of government and economic growth activities for the Klang Valley and the country. The development of Kuala Lumpur has taken the form of a definite concentration of physical and economic activities in the centre with ribbon developments taking place along the major arterials leading into the city. The City Hall of Kuala Lumpur is the largest municipal authority as far as size and functions are concern. The administration and management of City Hall are undertaken by 20 different departments or units including the Secretariat, each having its own head. Together these departments are headed by a Director General who is assisted by two Deputy Director Generals. The Mayor, appointed by the Prime
Minister heads the entire organisation and is an administrator with vast power and authority over decision making as far as development is concerned.

All applications for development in the city of Kuala Lumpur will have to be submitted to City Hall for approval. Depending on the type and scale of development, these applications will be processed and considered by either one of the following committees: (i) Town Planning Committee 1; and (ii) Town Planning Committee 11. The Town Planning Committee 1 which is chaired by the Mayor looks at the proposal for comprehensive and large scale development, layout plans, change of use of land and increased density, and the application for the use of government land. This committee comprises the Director General of City Hall, Deputy Secretary to the Minister of Federal Territory, and all the directors of the technical divisions. Before the application is reviewed by this committee, it will have to go through all the technical departments, and other related government departments for comments and recommendations. Based on these comments and recommendations, the committee will then decide whether to approve or approve with conditions or reject the proposed development , after which the Development Order will be issued by the Mayor.

The Town Planning Committee 11 looks into the application for development of shop houses, detach houses, mosques, industrial buildings, etc. The procedure adopted by the Town Planning Committee 11 is similar to the later committee, except that the Development Order will be issued by the Director General.

4.1 **Issues of Development Control in the Study Area**

The Commercial Central Area of Kuala Lumpur Metropolitan was selected as a case study for implementing the GIS development control. This area has the highest concentration of development compared to the rest of the city. It has a mixture of traditional shop houses, office complexes and modern hotel-cum

shopping complexes. To date the area still receives numerous applications either for new development or redevelopment. The City Hall receives many applications to redevelop the traditional shop houses to be repleced by a more up-beat commercial buildings (Adom, 1992). Such small scale development often carried out by private developers can be completed in record time but does little to contribute to the esthetic aspect of the city since it is done in a piecemeal manner. Applications for new development include hotel or shopping complexes and mega projects (floor space of more than 1 million square feet) normally carry out based on privatisation concept. Potential areas being planned for such developments include open space, government land, school and river.

Presently, the development of this area is based on the rather outdated development plan of 1970 which does not provide adequate guidelines to control the developments. In addition the City Hall applied some form of planning standards and restrictions such as plot ratio, density and plinth area. Such restrictions can still be negotiated by compensating with payment of development charges, provision of car parking and other facilities, surrendering land for road widening or providing building setback. The concern is that the development of the area if not properly and efficiently controlled it will not only adversely affect the form of the planned growth but the concern is that the image and identity of Kuala Lumpur will be eventually lost. To plan and control development in this area requires an information system in this area requires an information system that can not only assist in day-to-day but should aid in formulating development strategies able to cope with the fast changing scene.

4.2 **The Concept Of GIS for Development Control for Kuala Lumpur City Hall**

In light of tremendous pressure of rapid development while having no local plan to precisely guide the development control of the city of Kuala Lumpur, necessitates an information system which not only keep and display data pertaining to planning application for the purpose of administrative functions but it should also be designed to facilitate planning at strategic level. Figure 1 shows the conceptual design of the information system for the purpose of development control which is based on the planning process and the mechanism of development control that is currently being practised. The control of development which involves the process of analising the appropriateness of planning application requires various data from the relevant agencies. A planning application will be assessed in terms of current development scenario, land information, planning requirements and planning design. The application will not only be reviewed in terms of basic utilities (access, water supply, sewerage and telecommunication) but also public facilities (availability of public transport, educational facilities, religious facillities and safety factor).

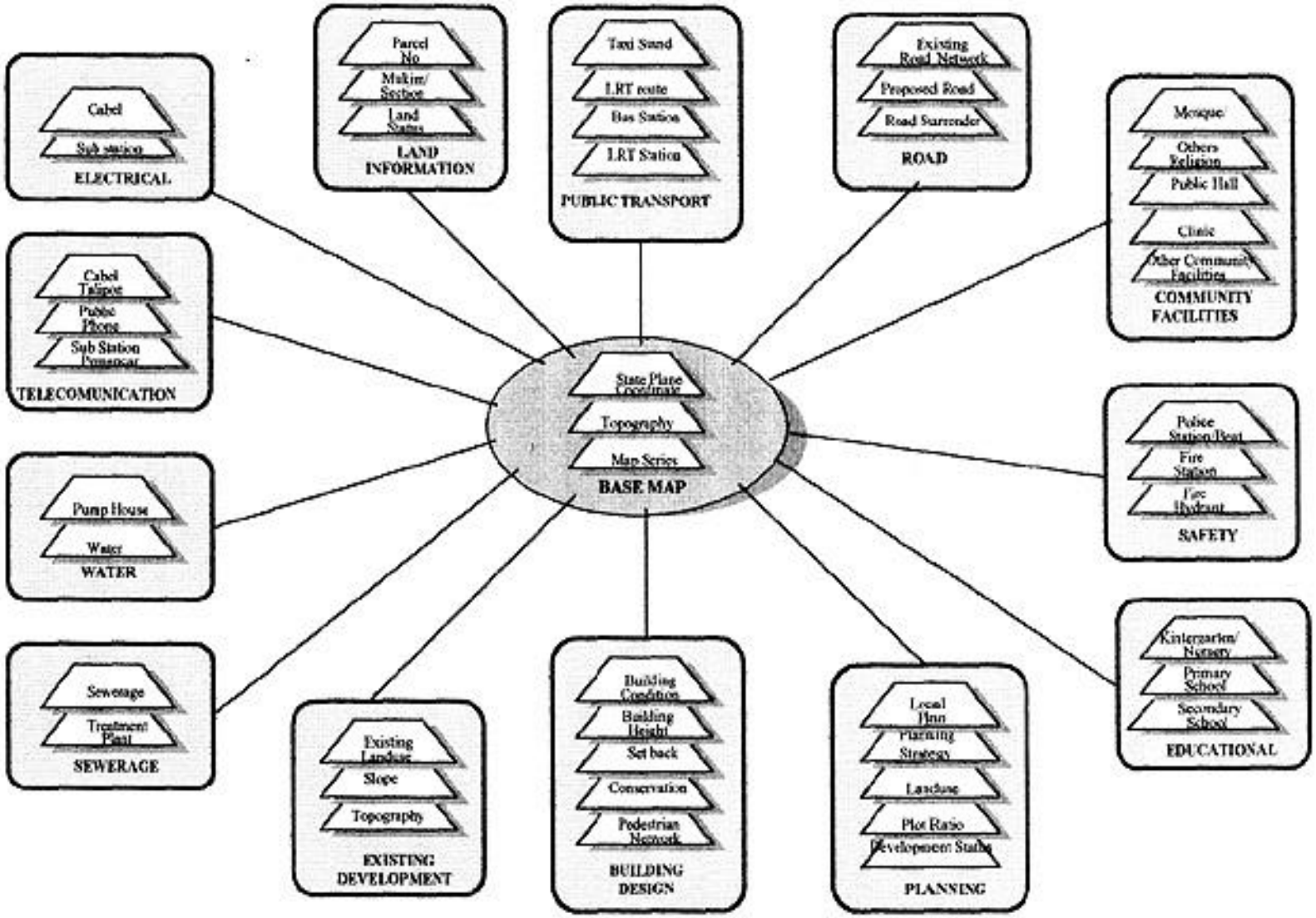

Figure 1: Design of Development Control Database

It is important that the GIS developed for development control to have the following features:

i Capable of analysing development strategies in terms of the roles and functions of Kuala Lumpur taking into consideration the policies outlined by the government. This can be done using current data on floor space of the development area as well as the whole planning area. By comparing this information and the control figure projected by the Kuala Lumpur Structure plan, the effectiveness of the development policies can be evaluated;

ii Capable of providing information to access the implications of planning application upon the provision of social and community facilities. The implications is easier to analyse and display if information on floor space is based on planning unit area;

iii Capable of identifying potential land available for development. This is useful to both the public and private sectors to determine future supply of floor space. Land supply is an economically dynamic process and very much dependent on government policies. Such information therefore form the basis for strategic planning.

iv Capable of identifying areas receiving development pressures to facilitate control and monitoring of the areas;

v Capable of facilitating technical evaluation of planning applications by displaying data on land use, plot ratio, transport system ect. used by other agencies involved in technical aspects;

vi Information on development and administrative polices formulated by the municipality which has been translated into spatial entity is important to enable the planners to advice applicants. The system should therefore be capable of displaying information on development status, surrounding developments, available infratructures and other planning requirements.

The relevance of the above features to the process of development control can be simplified in the following table (Table 1).

Table 1: Development control process and functions of information system.

Stage	Activity	Function of Information System
Initial Discussion	• Consultation to owner/ developer regarding potential, planning requirement, policies involved in the site.	• Data retrieval a. existing development b. development status, approval c. development plan d. planning policies
Processing Planning Application	• Registration • Site visit • Gathering data from various department • Identify planning issues • Preparing technical report • Analyse the application	• Identify potential land fro development • Translate policies formulated into spatial context • Identify development pressure area
Technical Sub Committee	• Comment on technical reguirement • Recommend the tchnical amendment to applicant	• Data retrieval from various agencies • Able to facilitate technical evaluation
Town Planning Committee	• Formulate and review planning policies • Considering planing application	• Capable of analysisng the development strategy • Provide information to evaluate the implication or planning application

5 GIS FOR DEVELOPMENT CONTROL IN THE KUALA LUMPUR CITY HALL

The design of GIS development control is based on the procedure and process which involved the following stages (Yusoff, 1997):

i) Initial discussion
ii) Registration
iii) Invitation for objection
iv) Development control process
v) Consideration by the Urban Technical Committee
vi) Consideration by the Urban Planning Committee
vii) Updating

5.1 **Initial Discussion**

This is the initial stage of the development control procedure whereby the applicants hold a discussion with the planners concerning the proposed development. Planners are expected to give advise on the feasibility of the application. Planners thus need to have information on current devlopment strategies, status of development, provision of development plan, planning restrictions and so forth relating to proposed site. Presently, planners need to sieve through a lot information before such information can be obtained and this can be time consuming and tedious. At this stage, GIS can easily provide current development scenario and planners can anticipate the feasiblity of the proposed development.

5.2 **Registration**

Every formal planning application is registered and reviewed by the Administration Section. Information from new application will be keyed in while spatial data in the application have to be consistent with the base map.

5.3 **Invitation for objections**

Every application involving a change of use or density will have to go through the process of objection by neighbouring landowners. The adjacent landowners to which the application relates will have to be indentified and notice served, inviting them to voice their objections to the proposed development, if any. At this stage GIS should be able to list the adjacent landowners and capable of displaying the changing development scenarios of the related area to be used as a platform in considering the objections.

5.4 **Development Control Process**

Before the Technical Committee can decides on the application, planners have to inspect sites, verify the planning evaluation report submitted to them and prepare their own evaluation report. Such report can be done efficiently if the planners can get access to the relevant data, such as road system, land status, ect., which, presently, are kept by various departments. GIS therefore have to be designed to enable easy access to those information and facilitate data analysis in determining the potential and constraints of the proposed development and able to assist planners in generating development alternatives.

5.5 **Consideration by the Urban Technical Committee**

At this stage, the Technical Committee which consists the representatives from the various departments will meet to review the proposed development. GIS should be able to display the relevant data from the various departments to facilitate those representatives to give their comments. GIS should be capable to indicate the implications of the proposed development and thus providing "early warning systems" if such development can adversely affect the city growth. For example, the proposed floor space should be able to indicate the traffic generated by the development, thus the committee can decide whether the current road system in that locality can accommodate the additional traffic. "What-if" analysis should also be part of the exercise to generate suitable development features based on different assumptions and criteria instead of rejecting the application outright.

5.6 **Consideration by the Town Planning Committee**

The Town Planning Committee plays a crucial role in the whole development control process. The Committee have to formulate development strategies and outline planning policies, taking into account the national policies and Cabinet directives which have to to viewed in spatial contexts. They also reviewed development strategies contained in the Kuala Lumpur Structure Plan and policies that have been implemented. GIS should be able to give them adequate information to facilitate decision making to the proposed development.

5.7 **Updating**

GIS for development control will have to be maintained and planning information will have to be updated continuously. Once the decision is made, both the spatial and attribute database should be updated.

6 IMPLEMENTING GIS FOR DEVELOPMENT CONTROL

The implementation of GIS for the purpose of controlling and monitoring development involved 4 stages, i.e:

i) Data gathering and updating
ii) Development of GIS database
iii) Development of user interface
iv) Application of GIS database

6.1 **Data gathering and updating**

This stage involved updating of both attribute and spatial data from the various sources. Most data will have to be verified since most available data is not up-to-date and previously maintained in various form, size and format.

6.2 **Development of GIS Database**

The Development of GIS database involve:

a) Development of spatial database

Spatial database are built on the base map using the scale of 1: 1584 which is currently used by the Department of Planning and Building Control. The available hardcopy maps have to be rigously up-dated because of the fast-changing development proposals by the developers. Maps are updated, digitised and maintained in the State Plane Coordinate System.

b) Development of attribute data

Attribute data were converted using Dbase and referenced using common map identifier. The required data include planning information, socio-economic and environmental data. Data are obtained from land records, while information on planning dand development are gathered from the pertinent departmental records. Data such as building features, current land use and activities which are not always readily available will have to assembled through field survey.

The GIS database has included the following information:

i) land use according to the Comprehensive Development Plan No.1039 used by the City Hall as a basis for development control;
ii) existing land use;
iii) proposed land use;
iv) building categories;
v) land ownership;
vi) building height;
vii) development status;

viii) buildings covered by the Rent Control Act (Act 168);and
ix) plot ratio.

7 EXAMPLE OF GIS APPLICATION

Once the GIS database has been developed, it can be intensively interogated to provide general development scenarios for every planning unit area, for examples:

i Development of commercial floor space area 1980-2000
ii Composition of commercial floor area 1980 - 1995 - 2000
iii Development potential for every planning unit area

These are examples of basic data which can be combined with other data to be used for development control (Figure 2, Figure 3 and Figure 4).

8 CUSTOMIZATION PROGRAM FOR DEVELOPMENT CONTROL

The design of GIS for development control is based on Arcview software. Several views have been developed based on planning requirements to facilitate data retrieval and analysis (Yusoff, 1997). These view are suitable to be used by planners in giving out advice, in processing development control, in analysing the feasibility of proposed development and in making decision. Examples of view that have been developed are:

i Existing development
ii Land information
iii Building information
iv Buildings covered by the Rent Control Act
v Planning requirements
vi Development status
vii Design guidelines
viii Current development policies
ix Commercial development
x Commercial development potential
xii Control and administrative

These views can considerably enhanced the rationality of decision making because of the readily information available to those involved in the development control process (Figure 5).

Figure 2: Existing Landuse

Figure 3 : Buildings Condition

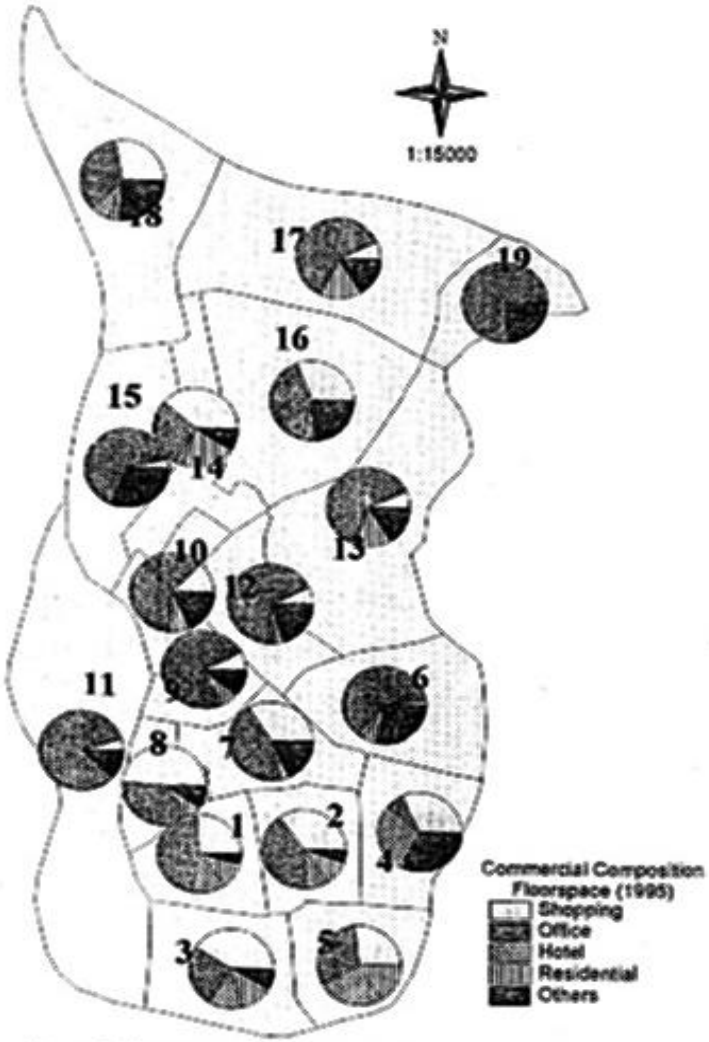

Figure 4: Commercial Composition Floorspace by Zone

Figure 5: User's Interface

8 CONCLUSION

The system that has been developed for the purpose of development control could be used by many parties involved in the process to be used as reference point in evaluating and deciding on the urban growth management programs in a more cost effective manner. This study however only demonstrates how information required by decision makers can be displayed and further study needs to be done to develop a decision support system to evaluate the suitability of a planning application.

REFERENCES

Adom, R. (1992) *Peraturan Mengemukakan Permohonan Perancangan ke Unit Pengekalan dan Seni Bandar,* Unpublished Report, Department of Planning and Building Control, Kuala Lumpur City Hall.

Ali, R.M. (1990) Development Control Guidelines - Managing the Physical Development of the Federal Teterritory, paper presented at the *National Conference on the Challenge and Opportinities in Urban Development,* Kuala Lumpur, Malaysia,

Scholten and Padding (1990) Working with Geographical Information System in a Policy Environment, *Environment and Planning B: Planning and Design*, Vol. 17, pp. 405-416.

Yaakup, A.B., Ibrahim, M. and Johar, F. (1995) Incorporating GIS into Sustainable Urban and Regional Planning: The Malaysian Case, paper presented at the *GeoInformatic'95 Hong Kong: International Symposium on Remote Sensing, Geographical Information Systems dan Global Positioning Systems in Sustainable Development and Environmental Monitoring,* Hong Kong, May 26-28, 1995.

Yaakup, A.B., Johar, F. and Dahlan, N.A. (1994) GIS and Decision Support Systems for Local Authority in Malaysia, *Proceedings of the 2nd International Conference on Design and Decision Support Systems in Architecture and Urban Planning,* Vaals, The Netherlands, August 15-19, 1994.

Yusoff, I.M. (1997) Guna Pakai GIS untuk Kawalan Pembangunan, Kajian Kes: Kawasan Perdagangan Pusat Kuala Lumpur, Unpublished M Sc Dissertation, Department of Urban and Regional Planning, Universiti Teknologi Malaysia.