'Cultures of Legibility' As a Complementary Approach to Site Planning For Southeast Asian Cities: A Case Study of Kuala Lumpur

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1 ABSTRACT

Most urban forms are illustrated with maps and plans but the precise relations between these images and the built form of cities is rarely being critically explored (Cosgrove, 2003). Against this background, this paper will discuss the various literatures on urban planning and design, and landscape theory; Southeast Asian studies; and GIS science, public participatory GIS and geospatial hypermedia. It will then look into the potential to contribute to (theoretical and policy) debates about Kuala Lumpur urban landscape and Southeast Asian cities, and to link these debates to wider discussions on landscape urbanism, which are currently oriented almost exclusively towards European and American exemplars. This paper aims to contribute to improving our understanding of emerging forms of settlement, develop better appreciations of popular forms of creativity and world-making, and will offer new modes of design practice informed by, what historian of cartography J. B. Harley has called, a 'cartographic ethics' which in return would contribute to a smart, sustainable, integrative and livable design of cities.

2 INTRODUCTION

The planning and management process of cities involves many stages of decision-making and expertise from various fields and hence necessitates for collaboration among the parties involved. In addition, public participation is essential as a means of improving information and to facilitate the adaptability of the planning system. Yet factors such as communication and collaboration breakdown due to a lack of trust and inadequate institutional support for communication among stakeholders as well as lack of effective means for public participation do not allow for effective spatial planning. As such there need to be an effective approach and strategy to support consensus-building as well as public participation in the desire to provide better governance of cities.

Mapping, if applied efficiently, can lay a strong foundation to a good governance of cities. A map is a scientific instrument and artistic representation of city space and life. It can be used to create and record a city. The use of map as a mean in the reconstruction and expansion of a city is known for 'virtually every great city – Paris, Rome, Vienna, Amsterdam, Jerusalem' (Cosgrove 2003). A map is also an instrument of urban policy, where, it is used to sustain the physical and social coherence of a city and in the case of metropolitan cities, to control their growth. A map's capability to regulate and coordinate a city can precede the physical presence of the city itself.

Theoretically, scientific cartography should create highly rational, coherence spaces in cities. However, in most cases, 'cities are among the least legible places on earth' (Cosgrove 2003). The problem of legibility in contemporary urbanism however does not reduce the importance of the map's role in urban place making and experience. The fact that 'urban space and cartographic space are inseparable' (Cosgrove 2003) cannot be argued. The feeling of being lost when walking in an unfamiliar city is often resolved by the use of various maps available, such as, of transit routes, of streets and of tourist destinations. One important aspect to look into is the possibilities to integrate these informal maps into the formal urban representation by the use of GIS technology.

GIS technology plays an effective role in the presentation and analysing of planning information. Spatial representation is critical to environmental problem solving. The attribute data related to the problems or issues to be addressed need to be translated into spatial manifestation to ease the process of analysis and decision making. Basically, information is utilised to perform two sets of task. Firstly, information has a role in the process of deciding what action to take, including both operational and strategic decision making and secondly, how activities are organised in terms of managerial control.

Reliable information is therefore needed at the management level to facilitate administrative procedures, policy planning and implementation as well as development strategy. It is a necessity for forecasting, modelling and evaluation of current situation and changes that are in progress. The quality of urban planning and management can be upgraded when available and valid data are handled in an advanced manner with the

aid of computers having the ability to retrieve information rapidly and efficiently, to model different scenarios and to evaluate alternative solutions generated by various modelling procedures. Undertaking a research which provides data on users' perception of the image of a city and its legibility would prove beneficial in complementing an existing GIS application and improving its viability.

3 PLANNING, URBAN DESIGN AND LANDSCAPE THEORY

The first theoretical framework is that work in planning, urban design and landscape theory which highlight on strategies and approaches of qualitative modes of representation, avoiding the quantitative and instrumental modes of representation. A range of distinguishing elements can be identified in these work such as anthropologically inspired interest in pre-modern spaces and vernacular forms, reactivation of the unconscious as motor of urban experience, and typo-morphological concern for the formal 'permanences' of the city fabric. Each element was developed using new, innovative representational styles such as 'de-layering' techniques, hybridized figure-ground drawings, adapted choreography and musical notations, and collage (Cairns and Reitsma 2006). This general work has created a considerable amount of interest and motivation for other researchers to carry out further work on urbanism such as 'recombinant urbanism' (Shane 2005) and 'sprawltown' (Ingersoll 2006). This material later intersects with the idea of 'landscape urbanism', an attempt to develop new design strategies that draw on landscape ecology and performative, temporal analyses of everyday life, supported by new styles of digital mapping and diagramming (Corner 2002).

Several attempts have been made to develop theory and method directly concerned with the relation between the society and its architectural and urban forms. In architecture, space is a central theoretical discipline. We are able to recognise society through the ways in which buildings, individually and collectively, create and order space (Hillier and Hanson 1988). Either in the past or at present, maps and plans are used to illustrate urban form but critical explorations on the precise relations between these images and the built form of cities are rarely found (Cosgrove, 2003). Unfortunately, only a small amount of this now rich intellectual work has addressed the rapidly extending metropolitan regions in Southeast Asia.

3.1 Urban Legibility

This research is also theoretically linked to two much researched on traditions: the image of the city and urban landscape studies. In conceptual terms, urban landscapes possess both tangible and intangible elements. Tangible elements are constituted by urban morphology and everyday events. Because they are expressed mainly in forms and patterns, these elements affiliate more closely with those elements discussed in Lynch's (1960) concept of legibility. On the other hand, landscape symbolism (Appleyard 1979; Cosgrove and Daniels 1988; Hull, Lam et al. 1994) and its spirit, known as genius loci (Norberg-Schulz 1980), comprise the intangible elements of an urban landscape. They are largely humanistic and subjective; they are also often misunderstood by people from different socio-economic and cultural backgrounds. It appears that Lynch's (1960) legibility is concerned mainly with the tangible elements, whereas his concept of imageability addresses the intangible and symbolic elements of the urban landscape.

The term "legibility" was first used by urban designer Kevin Lynch in his analysis of North American cityscapes in the post-war period. He argued on the importance 'to see the hidden forms in the vast sprawl of our cities' (Lynch 1960), which meant giving attention to the legibility of the cityscape. Urban legibility relates closely to the question of orientation. For a tourist, it may simply mean finding one's way, for a migrant, it may be central to how one comes to feel at home. The capacity to 'read' the city affects how one performs and acts in the city, and ultimately feels accommodated by, and empowered within, urban space and society. In diagnosing the emerging cultures of legibility in the city of Kuala Lumpur, this research assumes that this urban condition has something to say about Kuala Lumpur, and other cities in Southeast Asia, but also to wider international debates on urban landscapes, urban design and the representational technologies and languages of urban planners and managers.

Kevin Lynch's (1960) concept of legibility is used to operationalise the landscape image. Lynch (1960, pp. 2-3) defines the legibility of the cityscape as "the ease with which its parts can be recognised and can be organised into a coherent pattern", reflecting his concern with the architectural or built environment. A city is considered legible under three conditions:

- Potentially the interaction between the landscape and its inhabitants has created a mental schema in which places, buildings and landscape elements are easily identified.

- There is a relative ordered and coherent structure.

- Its inhabitants have a functional sense of place.

A legible landscape can

- help an individual interpret information and guide action;

- give him/her and important sense of emotional security;

- heighten the potential depth and intensity of human experience; and

- play a social role by furnishing the raw material for the symbols and collective memories of group communications. (Lynch, 1960).

The character and totality of an urban landscape can be broken down into distinctive sets of constitutive elements. Landscape is thus not just 'everything', but a choice of interconnected elements within a totality (Kobayashi 1989). On the other hand, the perspective or recognition of individual beholders is equally important in understanding the image of the urban landscape. Such landscape imagery performs an existential role in guiding the dwellers. By looking into the human cognition of landscape, this theoretical framework is not only responding to the general upsurge of humanistic and perception studies in human geography (Tuan 1975; Ley 1985; Pocock 1989; Bailly 1993; Ira and Kollar 1994), landscape design and planning (Berger 1987; Downing 1992; Hull 1992; Purcell 1992) and landscape aesthetics (Appleyard 1981; Nasar 1994); but also attending to the more recent issue of scientific cartography inability to capture the contemporary city (Cosgrove 2003) .

3.2 'Cultures of Legibility'

Subsequent scholarship extended the concepts of urban legibility and cognitive mapping into consideration of late-capitalist urban form. These new urban configurations, (motorized by global flows of capital, goods, information and people) extended into the landscape and, in a virtual sense, beyond into wider national and trans-national spaces. They threw up new, often territory-scaled and radically heterogeneous patterns of settlement that were difficult to comprehend in conventional urbanistic terms. The sub-disciplines of information, urban and way finding design responded by investigating new and practical aids to legibility within these emergent urban landscapes. Fredric Jameson, and other theorists of postmodern cultural politics, echoed this more applied work by calling for new kinds of cognitive mapping that would reassert our capacities to 'read' the late capitalist city. Jameson's call self-consciously drew on Lynch's terminology, but he also argued that such a project would require some kind of inventive 'breakthrough' to radically new and as yet unimaginable notational systems and forms of representation.

This research takes this line of thinking on urban legibility to the peri-urban or *desa-kota* (literally, 'rural-city') zones of Southeast Asian megacities – exemplified in this research by the city of Kuala Lumpur. *Desa-kota* zones result from the inter-penetration of wet-rice agricultural landscapes and urban, quasi-urban, suburban and rural settlement patterns. As such, they pose particular challenges to the conventional GIS-based cartography used by state planning authorities. The inhabitants of *desa-kota* zones, by constrast, have exploited new information technologies (mobile phones, PDAs, community internet booths, GPSs) and diverse, hybrid media (newspapers, magazines, street directories, and informal oral and mapping practices) to evolve innovative styles of urban representation that constitute their local nascent 'cultures of legibility'. Such cultures do not deliver a fully or evenly legible city, but a patchy city in which information is variably distributed and owned. In contexts such as this, the call to diagnose the 'hidden forms' of the cityscape (Lynch) and to invent representational 'breakthroughs' (Jameson) has a new imperative. This is not just a matter of more accurately representing what is there so it might be better managed and planned. It is also a matter of generating a representational system that recognises the complexity of local visual, orientational, navigational practices and empowers them by bringing them into contact with, and allowing them to restructure, the very parameters of existing official systems of representation.

4   SOUTHEAST ASIAN URBAN STUDIES

The second theoretical framework for this research is formed against the background painted by the literature that has addressed these regions in a sustained way, in geography, planning and Southeast Asian studies. Among this work, McGee's (1967) is particularly important in setting out a basis for discussion on Southeast Asian urbanism. He discussed on the main features of the growth, characteristics and roles of the great cities in the region of Southeast Asia. McGee attempted to compare the features and growth of Southeast Asian cities with the pattern of urbanisation which has emerged in the Western industrialised societies. His analysis of city growth pointed out clearly to the fact that the economic, political and social conditions underlying the process of urbanisation in Southeast Asia region were very different from conditions which existed in Western Europe (McGee 1967). In his later work, McGee concluded that in the context of Southeast Asian and Third World cities, 'a theoretical framework which regards the city as the prime catalyst of change as applied to Western cities must be discarded' (McGee 1971). The design of Asian cities has come to be defined by huge urban agglomerations as the basis for a new kind of city form. Taking Bangkok and Kuala Lumpur as examples, this approach is made clear by the existence of mega projects in both cities (Marshall 2004). This phenomenon in Southeast Asian cities again supports the fact that the conventions of practice developed in the West have no relevance for these new conditions.

Two decades after McGee's seminal work, Smith and Nemeth (1986) attempted to analyse the issue of the similarities and differences between urban structure and growth patterns in Southeast Asian region and other parts of the world. They concluded that contemporary cities and urban systems of Southeast Asia were much affected by their histories because 'urbanisation is a political process' (Smith and Nemeth 1986). Forbes (1996) highlighted the importance of having a good understanding of the Southeast Asian region's urban development pattern as the old frameworks as applied to the Western cities become less relevant and less accurate for Southeast Asian region. Evers and Korff's (2000) *Southeast Asian urbanism: The meaning and power of social space* gave a late twentieth century update of the early work of McGee. In their work, they had produced a more ambitious mapping of urbanism in Southeast Asia through globalisation perspective. The tensions between the flows of capital, information and labour that threaten to dissolve Southeast Asian cities into generic world cities, and other localising forces that persist and thrive within these flows were discussed.

Against this background, this research aims to investigate the practical and theoretical dimensions of urban legibility and apply it to the peri-urban or *desakota* (literally, 'rural-city') zones of Southeast Asian megacities. Megacity growth tends to sprawl along major expressways and railroad lines radiating out from older urban cores, leap-frogging in all directions, building new towns and industrial estates in areas thus far agricultural and rural. In such areas, regions of dense population and mixed land uses are created, in which traditional agriculture is found side by side with modern factories, commercial activities and suburban development (Marshall 2004). The concept of extended metropolitan regions or *desakota* zones has been coined for this amoebic-like spatial form. These desakota zones seem diametrically opposed to the city-based urbanization to which we are accustomed, where downtown cores radiate rings of lower and lower density.

5   GIS SCIENCE, PPGIS AND GEOSPATIAL HYPERMEDIA

 The third theoretical framework for this research is the field of GIS (Geographic Information Systems) studies, public participatory GIS and geospatial hypermedia. GIS are well known for their ability to store statistical data, for the analysis of trends and development and for the presentation of this information geographically (Scholten and Stillwell 1990). However, a GIS can be more than this. It can be a tool to assist public participation in the spatial planning process. Previous studies show that public participation GIS (PPGIS) is applied frequently in Canada, the United States, and United Kingdom (Kim 1998; Kingston 2002; Dieber and Allan 2003; McCall 2003). Poole (1995) found multiple examples of PPGIS outside these big countries; in Brazil, Philippines, Indonesia, Peru, Thailand, Kenya, and 15 other countries. However, the list from ESRI's PPGIS website (ESRI 1997) shows only one application from six Asian or African countries, compared with approximately 75 cases from North America. In the urban field, PPGIS is maintained, among others, to promote transparency in decision-making (Drew 2003). Representations in PPGIS are made from the maps, images, 3-D models and GIS outputs working with new visualisation software (McCall, 2003).

The amount of research on public participation via technologies such as the web and GIS has shown a steady increase over the years (Pickles 1995; Elwood 2002; Steinmann, Krek et al. 2004). Most of the works focus

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on the use of relatively cheap and widely available technologies, such as cell-phones, to capture increasingly high quality audio and (moving and still) images. Such digital material can be presented on the web in a hypermedia format that integrates audio and images with graphics and text to form non-linear, qualitative information narratives (Cairns and Reitsma, 2006). Geospatial hypermedia, furthermore, couples hypermedia potentials with quantitative geographical co-ordinates. It is this combination of qualitative and quantitative information that gives geospatial hypermedia the capacity to support community participation in planning processes (Grønbæk, Vestergaard et al. 2002).

GIS data which were made accessible on the internet by web-based GIS technology has offered an effective medium for public participation and collaborative planning. The internet is currently considered an important media. Its ability in enabling users to interact across the network has provided opportunities for retrieval of hypermedia information in an easy and effective way. Through the World Wide Web (WWW) multimedia capabilities, users all over the world have turned this technology into an important media to access and acquire information as well as interact using diverse types of visual representation such as images, maps, diagrams and graphs which are easy to implement as text supported by graphical interface, sound, video, animation and so forth (Silva, Saul et al. 2002).

5.1 Public Participation GIS

Public Participation GIS (PPGIS) is, as the name implies, the use of the Internet and web-based GIS systems in citizen participation processes (Craig, Harris, & Weiner, 2002). Increased public involvement in the definition and analysis of questions tied to location and geography is the domain of PPGIS. This approach facilitates the meaningful introduction of appropriate forms of spatial information and related technologies for widening public participation in the planning process. The acceptance of GIS as an appropriate technology for handling environmental information is for example recognised in Agenda 21. Many opportunities for public participation are laid down in the environmental legal framework and Internet GIS can support and facilitate citizen involvement in environmental planning and decision-making (Hansen, 2004a).

Carver (2001) has illustrated the complicated issue of public participation and geographic information through a SWOT analysis.

- Local people usually know their neighbourhood better than anyone else and they can thus provide detailed insight into local phenomena, which is not available from standard national GI data sets. In this way, incorporation of local knowledge into the decision-making process will be a major strength. Additionally PPGIS holds ability to visualise environmental information and communicate this information to interested stakeholders.

- The main weakness is related to the fact that the public generally do not possess the required knowledge to understand the generally complicated matters related to for example environmental impact assessment balancing environmental protection against mainly economic matters. Furthermore, the public does not have all the relevant information. As stated in both the Aarhus Convention and Agenda 21 the real opportunity for public participation lies in making the citizens more accountable for decisions made by given them more responsibility.

- The real threats for the participatory process are related to the antipathy against the politicians and other decision-makers. Although this is not the prevailing situation in for example the Northern Europe if we look at the participation at the general elections, we should not underestimate the potential feeling among ordinary citizens of why they should be involved if their input would simply be ignored or even worse misused or distrusted.

5.2 Interactive GIS

'Interactive' might represent the early 21st century concept of instant gratification: plug it in, ask it a question, and get an instant response. However, in the real world, interaction with the electronic knowledge system (i.e., the GIS) can occur in a number of conceptually distinct ways, each of which provides a legitimate use for the adjective 'interactive'. These include:

- Interacting (individually) across functions or departments. This can be either an employee of the authority or a citizen. The idea is that it is possible to peruse a large amount of data ''owned'' by

many individual departments or functional areas. The ability to share data across units is one characteristic of an ''interactive'' GIS system.

- Interacting (individually) within a single data set by applying workflow models or data models, usually in pursuit of an analytical response. The ability to perform analytical tasks, such as choosing a site or combining layers of information in a land suitability analysis, within the GIS is a second, but different, characteristic of an ''interactive'' GIS. Here, the interaction is meant in terms of getting an answer to a specific problem.

- Interacting (as a group) either across functions or departments and/or in depth in an intra-agency capacity is a third characteristic example of ''interactive'' GIS. This typically involves use of newer web-based GIS in an intra-agency setting. Here, the focus is clearly on intra-agency efficiency. It is similar to the first type of interaction, but involves groups.

- Interacting (as a group) either across functions or departments and/or in depth in an environment of public access up to and potentially including shared decision- making. Again, an answer is sought or a decision is created and supported. This last version of what could be meant by 'interactive GIS' has evolved, since the advent of the Internet Age (roughly post 1995), into what is now known as Public Participation GIS. Nowadays, it is generally accepted that participatory on-line systems will become a useful means of informing the public and allowing access to data and planning tools (on-line GIS) as an additional means of public participation. These will provide mechanisms for the exploration, experimentation and formulation of decision alternatives by the public in future environmental planning processes and have the potential to move the public further up the participatory ladder, although we must be aware of the weaknesses and threats mentioned above.

5.3 The Key Elements of a Successful PPGIS in an Organisation

There appears to be five key elements of a successful PPGIS in an organisation: (a) some meaningful inclusion; (b) a notion of a PPGIS organisation; (c) an appropriate level of interaction; (d) Internet use; and (e) collective efforts of the stakeholders.

- Inclusion. There have been attempts to update the Arnstein ladder to its e-participation analogue (Carver, 2001). The second manner in which inclusion is given priority is like the 'guiding principles' developed by Aberley and Sieber (2003) that appear on the home page of URISA PPGIS Conference web site (http:// www.urisa.org/ppgis.htm). The notion of inclusion is basic to democratic participation; but governments cannot force individuals to become involved. What they can do is to provide as much information accessible as possible. On the other hand, government may or may not want to undertake specific projects that are better initiated by individuals or groups of individuals.

- PPGIS organisation. The design and implementation of a Public Participation GIS framework is an evident action taken by some organisation or agency. There is recognition that PPGIS involves elements of organisational design and change, and Tulloch and Shapiro (2003) encourages treating PPGIS as a 'science' (i.e., the science of organisational design) rather than just as a technology. Thus, the GIS community recognises the need to go outside their own mostly technologically driven community to get help in understanding and designing GIS based citizen participation systems. Sawicki and Peterman's (2002) describe PPGIS organisations as those that: (a) collect demographic, administrative, environmental or other local area databases; (b) prepare the data for general use; (c) provide this information to local non-profit community-based groups at low or no cost.

- Levels of interaction. As in the ladder of citizen participation, GIS—interactive or participatory—are built with certain capabilities. At a very gross level of abstraction, these capabilities vary roughly from Viewing ! Analysis ! Support for Decision-Making. Viewing is akin to passive interaction. It is like searching some travel related web site for information. The fact that the data and maps are available should not be overlooked or downplayed, but this level of interaction is at best minimal in terms of participation in a government process. Analysis involves seeking an answer—usually to a well-defined problem posed by a citizen, singularly or as a representative of a group. The third level of interaction involves some discussion about both the modelling effort being employed and/or some aggregation of preferences in an environment where group decision-making is important. Citizen

participation processes are clearly more akin to the last level of interaction than the previous two. Based on a survey from the Netherlands, Geertmann (2002) concludes that PPGIS should be both more user-friendly and transparent but also flexible and adaptable to the planning situation at hand. These obvious contradictions cannot be removed unless the developers really address the target groups in the PPGIS design process.

- Internet use. The open structure and architecture of the Internet provide a rather simple mechanism by which information can be released to the public at relatively low cost for as well provider (the public authority) as the consumer (the citizens). However, despite the general spread of information and communication technologies, large parts of the world remain technologically disconnected. This so-called 'digital divide' threatens to cut off populations from good jobs and the chance to participate in the affairs of the broader society. Among the Nordic countries the digital divide exists but perhaps less pronounced than in other countries (Hansen, 2004a). Thus, gender does not have any significant effect on the use of the Internet, but age has more remarkable effects on the use. A more serious inequality is related to education, where Nordic persons with only primary education have Internet user rate at about 50% while academic and advanced professionals have user rates between 70% and 80% (Hansen, 2004a). One important finding is that if a person lives in a household with children he or she will be more likely to have access to computer and the Internet than those living in households without children. Thus children can be considered as the key to close the digital divide. However, solely relying on Internet based system for public participation may have to potential to strengthen the voice of younger, male, higher-income people who have more frequent access to the Internet, and thus possibly overriding the voice of the poor.

- Collective efforts of the stakeholders. Stakeholders, in this case is defined as those who are affected by, bring knowledge or information to, and possess the power to influence a decision or programme.

5.4 GIS for Public Participation in Malaysia

The notion of Malaysian public involvement in planning can be traced to the Town Board Enactment of the Federated Malay States of 1927. It provides for the general town plan to be displayed to the public to make objections and propose recommendation on how to overcome the objections. Later the Town Board Enactment 1930 provides similar arrangements for public involvement. In all these cases, the public was only allowed to participate after a draft plan has been completed.

The Town and Country Planning Act (TCP Act), 1976 which succeeded the Town Board Enactment was the only significant planning legislation which covers all local authorities in Peninsular Malaysia. The rationale of the TCP Act 1976 was basically to replace the Town Board Enactment which was considered extremely physical in approach and too rigid in accommodating changes in socio-economic needs for a country experiencing rapid development.

Public participation in Malaysia has been quite successful in informing the public about the development plan of their respective area. However, more significant contribution from the public is desirable to improve the relationship with the authority, which would facilitate better development effort for the country (Shamsuddin, 1994). Apparently, the web-based GIS technology has played an important role in encouraging public participation in many countries in the world. The GIS approach is seen able to handle the problem base on integration of GIS analysis and open public communication through proposals and objection from the public perspective. The capability in simplifying access and management of data has led to the implementation of data sharing between government organisations and local groups involved.

5.4.1 GIS Web Applications in Planning and Monitoring of Urban Development – Some Malaysian Examples

In Malaysia, the growing interest of developing web-based GIS in government organisations as well as private sectors has been a positive sign in extending the use of GIS application to the public, apart from allowing for refer and acquiring of geographic information in digital form. The need to obtain views and feedbacks from the public is the main factor that motivates the development of web-based GIS pertaining to their relevant fields and activities. The examples are GIS web applications at three different planning and management levels, that is, the regional level, the state level, and the local level.

Web-based GIS for Klang Valley or also known as AGISwlk was initiated as an extension to the prior developed database and application modules of the GIS for Klang Valley Region (AGISwlk). While AGISwlk was meant as a planning support system for decision makers in planning and monitoring of the region, the web-based GIS is more toward inviting public participation apart from providing information in the form of maps and data for public access, and paving the path for data sharing with agencies having the same interest (Yaakup et. al., 2004). The AGISwlk Web has two application modules to serve two different target groups base on the requirement and role of each one. The first module, the Public Interactive Maps Application, aimed at providing information on Klang Valley apart from inviting public participation from the general public. Meanwhile, the second module, the Stakeholder Application was designed to enable data sharing and collaborative planning between government agencies and planning authorities. The potential users intended for the Stakeholder Application are government officers. Fig.1 shows the interface for map display via the two applications.
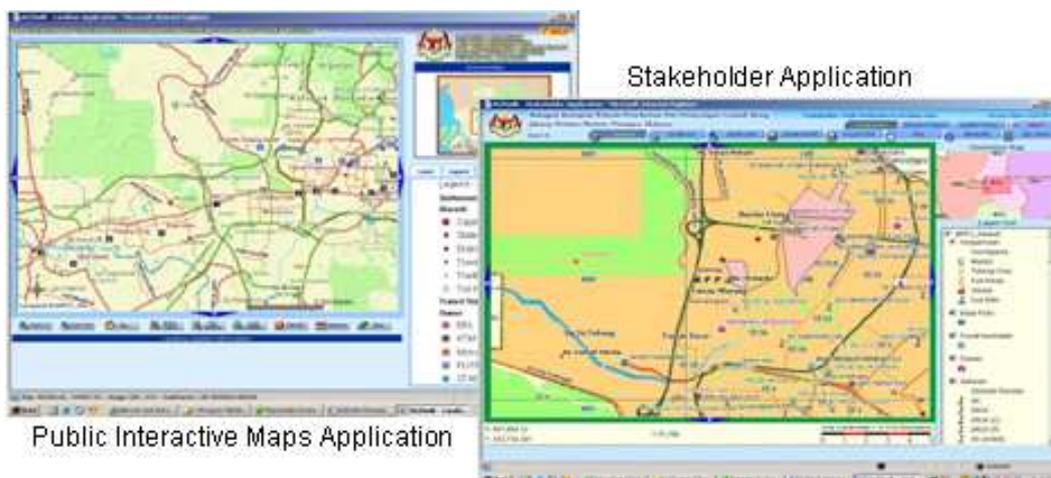

Fig. 1: Map display for the two different applications in AGISwlk Web

At state level, there is the development of web-based GIS application for the State Structure Plan of Malacca. This application was aimed at disseminating information in the form of development programmes for the state. Initially, the adopted concept was more toward display of information in the form of image and maps and allowing for easy and interactive access to maps and relevant policies (Yaakup, et.al., 2004). The web GIS developed is intended to improve public participation and collaboration in the decision making process through data sharing with government agencies, the private sectors as well as the general public. It allows for objections and proposals to be forwarded to the Department of Town and Country Planning through the feedback column provided (Yaakup, et. al., 2004) and hence helps improve the quality of planning apart from providing transparency to the current planning process.

The Interactive Maps Application for the Planning and Building Control Department, Kuala Lumpur City Hall was developed within a broader system package known as the Development Control System for Kuala Lumpur City Hall (KLCH). Fig. 2 shows the interface for Interactive Maps Application. This first such support system for local authority in Malaysia which emphasises on the planning and building control procedures and workflows, integrates as many as seven sub-systems including the Planning Authorisation, Building Control, Enforcement, Geospatial and Planning Information, Information Kiosk, Document Processing and Meeting Presentation (Yaakup et. al., 2004). The Interactive Maps Application is one of the modules developed under the Information Kiosk sub-system which serves to provide information regarding planning and development activities within KLCH planning zones. By keeping the public well informed of the development status in Kuala Lumpur and receiving feedback from users, the web-based GIS developed is seen to support the Planning and Building Control Department and Kuala Lumpur City Hall in upgrading the quality of planning and development control in its jurisdiction .

Fig. 2: Interface for Interactive Maps Application

In general, all the web-based GIS applications being developed for urban management, regional planning and as well as for development control purposes at local level in Malaysia aim at improving public participation in the planning process. However, none of these applications took up the perspectives of legibility in spatial representation and try to integrate this qualitative information into the existing application. Therefore, this research is timely to address this issue.

6 URBAN FORM AND LEGIBILITY, SCIENTIFIC CARTOGRAPHY AND COMPUTER-BASED TECHNOLOGIES

A History of Spaces (Pickles, 2004) provides an essential insight into the practices and ideas of maps and map-making. It draws on a wide range of social theorists, and theorists of maps and cartography, to show how maps and map-making have shaped the spaces in which we live. The book begins by asking a seemingly very simple question: what does it mean to draw a line? It answers this question with the seemingly simple answer: to create a boundary, to define a space, and to shape an identity. The book builds on this foundation by exploring how historically maps have reached deep into social imaginaries to code the modern world. Going beyond the focus of traditional cartography the book draws on examples of the use of maps from the sixteenth century to the present, including their role in projects of the national and colonial state, emergent capitalism and the planetary consciousness of the natural sciences. It also considers the use of maps for military purposes, maps that have coded modern conceptions of health, disease and social character, and maps of the transparent human body and the transparent earth. The final chapters of the book turn to the rapid pace of change in mapping technologies, the forms of visualization and representation that are now possible, and what the author refers to as the possibilities for post-representational cartographies.

This research on cultures of legibility is strongly based on Cosgrove's work, Carto-City (2003). The functions of scientific cartography in urban mapping, its practicality and effectiveness, and as well as its advantages and disadvantages is discussed by Cosgrove in this work. Cosgrove also focused on ways that the urban map is positioned between creating and recording the city. He explored on ways the modern city and social space interacts with 'the map as scientific instrument and artistic representation of its space and life' (Cosgrove 2003). He suggested that this interaction is 'apparent in post-modern American city such as Los Angeles, Houston and Phoenix' where every square metre is geo-coded for various purposes ranging from environmental protection to religious evangelism.

Theoretically scientific cartography should make these cities highly rational and coherent spaces. However, in reality they 'are the least legible places on earth' (Cosgrove, 2003). Cosgrove claimed that the urban landscape seems to confirm the problem of legibility in the constant and competitive presence of words, phrases and whole texts (billboards, street signs and posted ordinances) within it. He argued that the extensive volume of written language in the public spaces of contemporary urbanism has eroded the effective harmonising relationship of image and text. Cosgrove suggested that a characteristic way of negotiating movement within the post-modern American city is the computer generated map. He mentioned the use of Map Quest© which can create 'an instant digital image of any urban location at any requisite scale using simplified set of standard colours and cartographic signs'. However he pointed out that the image totally ignores the context of place they represent and unconcerned with the city as public space.

Cosgrove suggested that scientific cartography inability to capture the contemporary city has opened new possibilities for urban mapping to look into the connections between city space, city life and mapping. Improvement of urban legibility was thought to be achieved through the use of geometry in the early modern city planning. Urban legibility then became the goal of city mapping, to be achieved through precisely measured survey producing maps whose intent is analytic rather than synthetic. By mid-19th century, plain-style urban plans were used as base maps for urban statistics. In the 20th century, controlling metropolitan cities was a dominant theme in urban mapping. Maps were used to their maximum capacity either to make the city more legible or to regulate its material and social disorder. Map was used as an instrument of urban policy, to recapture the legibility of the city on paper and sustain its physical and social coherence.

Advanced computer-based technologies of the 21st century have been more successful in assisting urban mapping to project the future form of the city than in capturing the legibility of its daily life. These mappings may deploy the analytic capacities of scientific cartography in capturing legibility from the contemporary city as a way of enhancing the experience of everyday life. Cartographers used the latest GIS technology to coordinate and plot diverse data sets realising that the contemporary city 'presents both complex new challenges and enormous opportunities for mapping' (Cosgrove, 20023). Cosgrove concluded that the goal of rendering legible the city remains an urgent one and the current visual technologies open up greater opportunity for creativity in shaping and recording urban experience. Taking on this line of thinking, the framework for this research is thus developed.

The concept of legibility promoted by Lynch in 1960 is closely related to 'cognitive mapping', the process of representing a city so as to mentally grasp its form and adequately orient oneself within it. Lynch invented an important notational system that enabled him to diagnose and assess the variable legibilities of a given city. Lynch's work in the 1960 led to along line research in other fields such as anthropology, sociology, geography and environmental psychology. Some studies extended the concepts of urban legibility and cognitive mapping into consideration of late-capitalist urban form. These new urban configurations, (motorized by global flows of capital, goods, information and people) extended into the landscape and, in a virtual sense, beyond into wider national and trans-national spaces. The sub-disciplines of information, urban and way finding design responded by going further into investigating new and practical aids to legibility within these emergent urban landscapes. Fredric Jameson, and other theorists of postmodern cultural politics, echoed this more applied work by calling for new kinds of cognitive mapping that would enhance our capacities to 'read' the late capitalist city. Jameson also argued that such a project would require some kind of inventive 'breakthrough' to radically new and as yet unimaginable notational systems and forms of representation (Cairns and Reitsma, 2006).

These new urban phenomena cannot be analysed with ideas developed for the reality of the ancient town or the old industrial metropolis. As such, they pose particular challenges to the conventional GIS-based (Geographic Information Systems) cartography used by planning authorities. In contexts such as this, the call to diagnose the 'hidden forms' of the cityscape (Lynch) and to invent representational 'breakthroughs' (Jameson) has a new perspective. Apart from identifying the appropriate approach to 'more accurately representing what is there so it might be better managed and planned, it is also a matter of generating a representational system that recognises the complexity of local visual, orientational, navigational practices and empowers them by bringing them into contact with, and allowing them to restructure, the very parameters of existing official systems of representation' (Cairns and Reitsma, 2006).

7 CONCLUSION

This research is significant in a number of perspectives. First, the Kuala Lumpur urban landscape itself deserves sustained academic attention as it is emerging as an important metropolitan in the Southeast Asian region but has yet to receive enough attention from academic researchers. This research has the potential to contribute to (theoretical and policy) debates about Kuala Lumpur urban landscape and Southeast Asian cities, and to link these debates to wider discussions on landscape urbanism. Second, there has been, to date, little work on the ways in which visual media and representational systems impact upon the design, planning and management of extended metropolitan regions. As highlighted by Cosgrove (2003), in the past and at present, urban forms are explained using maps and plans but the precise relations between these images and the built form of cities are seldom being critically explored. While architectural, urban and landscape theory have usefully theorized the 'agency' of different visual media, it rarely draws on empirical material from

outside the west. On the other hand, the existing geography, planning and Southeast Asian studies have not engaged substantively with the innovative work on representation conducted in these design-oriented disciplines. While the work in GIS has productively extended the boundaries of public participation planning, most of it remains its focus on the technology and taking 'the community' as an uncomplicated and unproblematic set, whereas this research aims to examine the fluid socio-spatial configurations of the community. Third, the proposed outputs of this research will represent significant innovations in their own right, as they will 'exploit the qualitative potentials of advanced information technologies by putting them in touch with new modes of urban representation' (Cairns and Reitsma, 2006).

In addition, this research will address inter-linked academic audiences in architecture, urban and landscape design theory, urban theory, urban geography, cultural studies, and postcolonial studies, and qualitative GIS research. The research will contribute to improving our understanding of emerging forms of settlement, develop better appreciations of popular forms of creativity and world-making, and will offer new modes of design practice informed by, what historian of cartography J. B. Harley has called, a 'cartographic ethics'. Moreover, the existing literature suggests that most empirical examples in published materials are drawn from European and American cities. There is no evidence to confirm that the same constitutive elements of the image of the city can be found in or relevant to cities in developing countries (Karan and Bladen 1982; Del Rio 1992).

Thus, this research has the potential to contribute to theoretical and policy debates about Kuala Lumpur and Southeast Asia, and to link these debates to wider discussions on landscape urbanism, which are currently oriented almost exclusively towards European and American exemplars.

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