i-PUTRA.COM: A DIGITAL SOFT CITY OF PUTRAJAYA

AHMAD RAFI, M.E.
Faculty of Creative Multimedia, Multimedia University
Cyberjaya, 63100 Malaysia
ahmadrafi.eshaq@mmu.edu.my

Abstract. This paper presents our experiment and development of i.Putra.com - a digital soft city of Malaysia's new administrative Capital Putrajaya. This project is funded by Putrajaya Holdings Sdn. Bhd. Malaysia and was originally developed by the Multimedia University before finally executed by I-Design Sdn. Bhd. It is designed to be an interactive channel for the civic and urban activities that parallel, enhance, compliment, and sometimes 'compete' with physical Putrajaya. Putrajaya's goal is to be the administrative capital for the governance of cyber communities where digital bits rather than physical assets are the primary scarce resource (Putrajaya Holdings, 2002). The guiding principle for i.Putra.com is content, context, community and commerce in which they will be integrated with the city information such as residential, commercial, service and public areas. As the city is being built, i.Putra.com will expand to provide an interactive channel for those who live in, work in, or visit Putrajaya.

1. Introduction

While an urban and a physical city is mainly shaped by geographic properties, planning regulations, landmarks and infrastructures, the daily life and activities contribute mostly to the urban memory (Lin et al, 2002) or a place for exchanging information. Studies that reflect the ideas on establishing a cyberspace attached to physical space to increase the influence on the urban fabric from architectural perspective were explored by Mitchell (1995 and 1999) and Liu (2001). Researchers from other fields, such as geography (Dodge and Kitch, 2001, Kwan, 1999; Batty; 1997), sociology (Weber, 1995; Castells, 1998) and urban logy (Hall, 1998) studies, identify different overall frameworks of cyberspace to interpret the relation (Chang et al, 2002).

The urban models are created for very different reasons, ways and levels of detail that contain the city information in the form of 2D, 3D, and other modules of interactive content. Ennis and Maver (2001) believe that Internet information system can help to keep these models 'alive'. This has been implemented in VR Glasgow (http://www.vrglasgow.com). The system is capable of tracking the user participation in a sophisticated manner to be able to archive 10,000 visitors' information per year. Dokonal et al, Holmgren et al, Knight et al and Pietsh et al agree that educational needs and the demands of planning departments can furthermore establish new possibilities for urban analysis (Dokonal, 2001). Innovative ideas such as City Experimental Labs (Voigt, 2000) or Labs for Morphological Analysis of Spatial Volumes (Dave, 1994) may open new insights for the use of 3-D city models. However, one of the questions that arises is how do you keep the 'digital dust' away from these models and make them play an active role in supporting life in real cities?

2.   Ideas of Utilising 3D Digital City

There are several attempts made for keeping city models 'alive' in terms of utilising the models as well as increasing the activities (participation) within the urban fabric. Four current 'web-based' digital cities are selected based on the difference approaches of the 'web-based' technology and content to add value to the physical city activities and communications. Discussion will focus on the qualitative understanding of the project brief, methods and solution.

2.1 THE LIVERPOOL CITY MODELS

2.1.1 Brief
The Liverpool City models were developed by the University of Liverpool to be used by the students and by local practioners to aid in the development of designs (Dokonal et al, 2001). The idea behind this is to present significant buildings in Liverpool over the Internet using a number of different technologies (Berridge et. al., 2002). These virtual reality models were combined with a web-based database that provides the content for the site.

2.1.2 Method

The models were created in 3D environment as a base before converting the animated tour into 3D Flash files. The animated tours use a pseudo 3D model (Berridge et. al., 2002) to establish and navigate the user in reference to the city (e.g. building) context such as the overall plan, city landmark and featured buildings. The content is supported text, images and animation. A web enabled PDA is also being implemented and customised the tours primarily for the mobile user. A city navigator component is imparted in the system to enable the user to determine and locate the selected building

2.1.3 Solution

The multi-modal implementation of the database approach allows user to access architectural information using current technology. The idea to incorporate pseudo 3D model into various systems add value by making the data more accessible, up to date and improving way finding.

2.2 THE GRAZ 3D CITY MODELS

2.2.1Brief

The students at Graz University of Technology develop a 3D City Model of Graz, Austria. The model is built as a 3D City Information System (Dokonal, et. al., 2000) for public consultation, planners as well as improving the current resources for architectural education.

2.2.2 Method

The 'photo-geometrical evaluations' of aerial pictures were used to compare the roof configurations. Other building details and features were recorded on site before being developed in AutoCAD drawings. Building data were then entered into a database system at different level of details (LoD). The database allows additional information storage derived from aerial pictures (e.g. dormers of roof and chimneys) and space defining elements (e.g. façades).

2.2.3 Solution

The 3D City Models of Graz has improved the current available resources of both architectural and urban design on a 'low budget' (Dokonal, et. al., 2000) strategy. Their record has shown that time consumption per premise amounts to approximate 10 buildings per student within roughly 2 days.

2.3 DIGITAL TAINAN

2.3.1 Brief
Digital Tainan is developed by the National Cheng Kung University, Taiwan to design similar content with the physical city, but represent the city by a new structure (Lin et al., 2002) with existing information. The detail information includes the site-address, volume, context and information (i.e. events and activities) in which it is classified into City (level 1), District Zone (level 2) and Street Building (level 3).

2.3.2 Method
The interface of Digital Tainan consists of text, images, 3D models, panoramic views, animation, VRML and sound to experience the activities and events stored in a database. Users will relate their 'cognitive maps' through the critical design of the building and the context detailing (e.g. signboards and audio effects of the activities) by search, navigate, explore, and describe function (Lin et. al., 2002).

2.3.3 Solution
The Digital Tainan is a container with memories of the past and activity information at present to reflect the personal experiences (Lin et. al., 2002) which emphasize the memories of different users. The passive interaction allows the user to choose the arranged roles and scenarios to explore the information of the digital city.

2.4 VR GLASGOW

2.4.1 Brief
VR Glasgow was developed by ABACUS from the Department of Architecture, University of Strathclyde to cater for four different groups namely tourism, education, architects and city planning. Several pre-set routes were established to guide tourist selection of hotel, entertainment, shopping, landmark and transport that include QTVR as the key feature. The Glasgow Directory is being used on various level of educational context primarily to locate schools, museum, university as well as introducing the concept of computer modelling (Ennis and Maver, 2000) application. The directory is also being used and accessed by the architects and city planners for design decision process by allowing new design proposal to be imparted within the models.

2.4.2 Method

VR Glasgow used the conventional Internet-based techniques through search engines, lists, and tables. The systems relies on VNET server program running on the host machine which handles communication with each remote client as they login and explore in the 3D environment (Ennis and Maver, 2001). The shared space enables the user to explore via avatar representation (Java VRML) and a chat window for communication.

2.4.3 Solution

The VNET software enables users to explore the city of Glasgow model as well as to see the avatars of each other while moving the selected zone. It would be an advantage to reduce the time spent of the less experienced visitors by having the guided tour that have resulted a higher number of participation (visitors).

2.5 DISCUSSIONS

All of the four digital cities rely on the web-based and database driven structure to connect and most importantly to update the user. The representation of interfaces of the digital city especially the 3D environment (e.g. avatars) and the 'structured' navigation helps a lot to give a better exploration for the less experienced users. Specific target audience is required to ensure the participation and the design of the content selection. By having these models on the web, the specific target audiences are able to access and participate in the soft city's activities, even when they are away from home.

A common link between these models is that the creators of these models are also the inhabitants of the actual physical city. Thus, developing these cities provides authenticity to the design as well as authentic concerns and activities are addressed that only the actual inhabitants living in that particular community can understand and appreciate. City planners (as proposed by The Liverpool City Models, The Graz City Models and The VR Glasgow model) within the specific city are able to address real concerns faced by its inhabitants and address them appropriately. Moreover, planners are able to share their ideas, designs and concerns as well as findings with other departments or units and coordinate efforts for the betterment of the city and its inhabitants.

By creating a container of memories, as proposed by The Digital Tainan model as well as The VR Glasgow model, of the past and activities of the present, actual dwellers, using these soft city models, are able to get a sense of belonging and community. Thus, through active participation these models are kept 'alive', as they are able to share their memories and

experiences through activities, interests and concerns affecting the city with other city dwellers and even visitors. Those living outside the area or tourists that are interested in visiting a particular city will be able to get a sense of the environment as well as the opportunity for 'a day in the life of' experience through participating in these soft city models. This will enhance the reputation of the city as a city that uses state-of-the-art technology while preserving essence and traditions of the city.

3. i-Putra.com

Putrajaya Holdings Sdn. Bhd. the lead developer of Putrajaya has taken the challenge of building a digital community or community that is 'connected' (utilised) using the technology (Internet) on a wide scale basis. i.Putra.com is designed to be an interactive channel providing services to the residential and business community (figure 1).

Figure 1: i-putra.com web site (source from http://www.i-putra.com)

Five core channels were established to reach every conceivable strata of the community namely children, teenagers, young adults, parent and other adults and business. Each channel was designed to suite specific target audience by demonstrating different level of interactivity, navigation and utilisation. The interactive content (i.e. 'I') includes I-education, I-asset, I-content, I-community, I-government, I-lifestyle and I-others (figure 2).

i-putra.com						
	Kids	Teens	Gen-X	Family	Business	
i-education	i-asset	i-content	i-community	i-government	i-lifestyle	i-others
Universities	i-Luds	Narrowband	Putranews	GOE	Women	i-management
Colleges	i-property	Broadband	Activities	PMS	Style	i-traffic
Schools	i-utility	Mobile	Religion		Teens	
Kindergarden	i-service		Chat/Gossip		Home	
Tuition			Yelowpages		As-seen-on	
Network					Others	

Figure 2: i-putra.com structure

i-Putra Kids Channel is dedicated to the children of Putrajaya from toddler to pre-teenager. The content includes 'edu' kids, smart kids and kids circle. The kids are expose to self-learning experience such as Kumon Methods of Learning (figure 3).

Figure 3: i-Putra Kids Channel (source from http://www.i-putra.com)

i-Putra Teens Channel is focused to the older children of Putrajaya and designed to suits young, energetic and creative through the style, education, get around e-teens (figure 4).

Figure 4: i-Putra Teens Channel (source from http://www.i-putra.com)

i-Putra Gen X Channel is for young adults. The concept of hip, cool and trendy will be the key features to draw the users' attention with current trends. It contains Style, Pixel, E2X and Mix Around (figure 5).

Figure 5: i-Putra Gen X Channel (source from http://www.i-putra.com)

i-Putra Family Channel represents ideas for parents and older adults that emphasis security, stability and society. This channel is supported with a series of interactive content that includes lifestyle, parenting, community and entertainment. This is linked with the local 'décor' magazine, Impiana for the users to explore and gain ideas of residential, smart living and Do-It-

Yourself (DIY) design. Parents are also guided by Putrajaya Hospital on health issues such as common diseases and family planning.

Figure 6: i-Putra Family Channel (source from http://www.i-putra.com)

i-Putra Business Channel is a portal on its own with comprehensive databases of information relating to commercial and residential properties, and other development components of Putrajaya. Potential developer, architect, designer, client and visitor for example can surf different sort of illustrations and interactivities to search for the information on specific location. Architects for example can have the detail explanation on the plot ratio, costs and context for building and planning permission. Clients may view the 3D (including VRML) and 2D models of the space to view the interior and exterior before make a selection through Interactive Land Use Database System (I-Luds) and Interactive Properties Database System (Putra Properties) which demonstrate e-commerce application (figure 7 and 8).
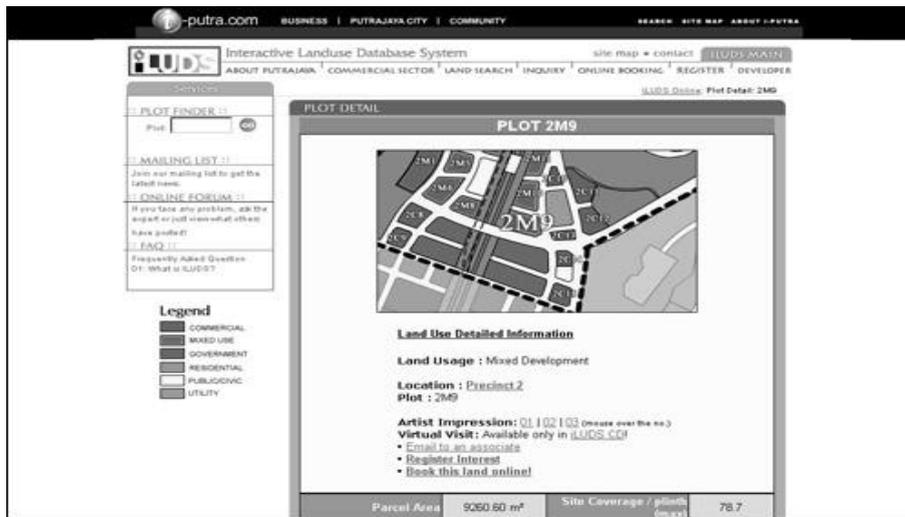
Figure 7: i-Putra Business Channel (source from http://www.i-putra.com)

Figure 8: I-Luds web site (source from http://www.i-putra.com)

i-Community Channel compliments Putrajaya City services. Amongst those that have been developed are mosque online, education online and hospital online. Each component is linked to a physical entity. For example Mosque Online not only provides information on religious issues but it

allows the user to chat, interact and discuss with the Putra Mosque staff online (figure 9).

Figure 9: Putra Mosque Online (source from http://www.i-putra.com)

In Education online, the study groups sessions, online tuition and other resources were established through Smart school to allow students to learn and explore at his or her own pace and time. Similar to this, the Hospital online allows patients to communicate with doctors for consultation and medical report (if necessary) in which the virtual visit is made available to locate individual department.

4. Conclusion

i-Putra.com provides an opportunity to improve and accelerate the 'virtual activities' in an active manner and to add value in the overall city lifestyle. It provides a test bed and model for other virtual communities that are to follow. The success (or failure) of this portal will be more dependent on Putrajaya's community as well as global participation (netizens) to comment and exchange information in a 'shared cyberspace'. Updating the databases and new features will be a continuous routine to ensure richer content creation. By integrating multimedia and interactive elements in to the portal, it is hoped that users are able to communicate with ease and more naturally. It is also suggested that i-Putra.com will be one of the valuable assets to set a foundation of the soft city design.

Acknowledgements

References

Berridge, P., Brown, A. and Knight, M.: 2002, One City to Go: A Multi-modal Approach to Delivering City Data. In the Proceedings of the 7th International Conference on Computer Aided Architectural Design Research in Asia (CAADRIA) Cyberjaya (Malaysia), pp. 057-64

Chang, Y.L., Lee, Y.Z. and Liu, Y.T.: 2002, Construction of Digital City in Physical City: Cyberspatial Cognition Approach to the Project of Hsin-Chu Digital City in Taiwan. In the Proceedings of the 7th International Conference on Computer Aided Architectural Design Research in Asia (CAADRIA) Cyberjaya (Malaysia), pp. 109-116

Dave, B. and Schmitt, G.: 1994, Information systems for urban analysis and design development, Environment and Planning B: Planning and Design 21, pp. 83-96

Dokonal, W. and Martens, B.: 2001, A Working Session on 3-D City Modeling, Architectural Information Management In the 19th eCAADe Conference Proceedings, Helsinki (Finland), pp. 417-422

Dokonal, W., Martens, B. and Ploesch, R.: 2000, Graz: The Creation of a 3-D City Model for Architectural Education. In the Proceedings of eCAADe, Weimar (Germany), pp. 171-175

Ennis, G. and Maver, T.: 2001, Visit VR Glasgow - Welcoming multiple visitors to the Virtual City, Architectural Information Management. In the 19th eCAADe Conference Proceedings, Helsinki (Finland) pp. 423-429

Lin, H.T. and Chiu, M.L.: 2002, From Urban Landscape to Information Landscape: Digital Tainan as an Example. In the Proceedings of the 7th International Conference on Computer Aided Architectural Design Research in Asia (CAADRIA) Cyberjaya (Malaysia), pp. 101-108

Liu, Y.T.: 2001, Defining Digital Architecture: The 2000 FEIDAD Award. Taipei: Dialogue

Mitchell, W. J.: 1995, City of Bits, MIT Press, Cambridge, MA

Mitchell, W. J.: 1999, Replacing Place, in P. Lunenfeld (ed), The Digital Dialect: New Essays on New Media, MIT Press, Cambridge, MA, pp.112-128

Putrajaya Holdings: 2002, A Commercial Investment, Putrajaya Holdings Complimentary CD-ROM and Brochure. http://www.pjholds.com.my or http://www.i-putra.com (1 Nov 2002)

Voigt, A., Walchhofer, H.P. and Linzer, H. (2000) City Experimental Lab, SIGraDi'2000 - Construindo (n) o espacio digital (constructing the digital Space). In the 4th SIGRADI Conference Proceedings, Rio de Janeiro (Brazil), pp. 143-146