UNIVERSITI TEKNOLOGI MARA

THE INTEGRATION OF 3D GIS AND VIRTUAL TECHNOLOGY IN THE DESIGN AND DEVELOPMENT OF GIS-BASED RESIDENTIAL PROPERTY MARKETING INFORMATION SYSTEM

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ABSTRACT

Decades ago property information such as location-based data were recorded and displayed on thousands of maps. Geographical Information System (GIS) technology has transpired to cater the growing need of spatial data handling analysis. Existing property marketing systems do not allow 3D representation and virtual environment of the property and its neighbourhood. GIS and 3D technology will enable users to relate spatial and attributes data, to spatially visualize data and reveals the hidden relationships, patterns and trends. The research aim is to explore the potential integration of 3D and virtual technology in the design and development of GIS-based residential property marketing information system (GRPMIS). The objectives of this research are, i) to study the user requirements for the development of GRPMIS and its current practices, ii) to explore and investigate the potential use of GIS, 3D GIS and virtual environment (VE) in the GRPMIS, iii) to design and develop the GRPMIS. The method adapted in this research is based on standard System Development Lifecycle (SDLC) which is divided into three main phases i.e. User Requirement Study, System Design and Development, and System Implementation, Testing and Evaluation. The 3D analyst an extension in ArcGIS, Map Objects and Microsoft Visual Basic, Sketch-Up 5.0 and its GIS plug-in, 3D Model-Builder and Media Player Codec are the software used within the developed system. The user requirements are outlined based on informal method; semi-structured interview and survey questionnaires given to a group of developers and consumer and literature of existing system. Four methods of integration were examined and indicate that GIS, 3D and virtual reality technology can be integrated into a system by coupling two or more software. The study also determined that a high capacity of computer technology is crucial and the testing needs an extension of time. The GRPMIS is evaluated and tested using black box and white box testing method. The study of user requirements has shown that the existing property marketing system requires an improvement. Based on the study carried out, ten user requirements for the proposed system such as the system should allow users to perform location query and view projected map on the screen, the system should provide users with the topographic information of the housing area and the system should enable users to print out the report were identified. The study has also indicates that a combination of methods of integration can affect the system performance and capabilities. The prototype system developed by the author allows users to display the perspective view of the property and highlights important aspects in buying a property such as the topography, accessibility, neighbourhood and surrounding area in a more realistic way. The results of this research can be used by the real estate agents and property developer as the framework and references for future development of a better conducive property marketing information system. As a conclusion, 3D GIS and virtual technology can be integrated into GRPMIS and enhanced the system capabilities by simplifying the traditional flow of housing selection.

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INTRODUCTION

1.1   Background

"The property industry deals in billions – of pounds and square feet of space. The work loadings on developers, contractors and professionals alike are demanding – sometimes overwhelming – but few will admit it" (Sir Christopher Benson, Vice Chairman and Managing Director, MEPC plc,1988)

"... the strongest tangible benefit noted by many users of GIS for land and property management was the ability to visualise relationships between property and the surrounding geography by mapping land and property assets... the strongest intangible benefit was the data audit and cleaning..." (Wyatt and Ralphs, 2003)

Housing estates and property industries have become significantly active industry in Malaysia. This has led to a large number of investments from the property developers, contractors, professionals and local authorities. The rapidity of property development results in more choices of houses available. Consumers will certainly become more indecisive towards making a choice. According to Narains Corporation (1971) a famous property consultant and realtors in India, property management can be defined as the functions of looking after buildings. These functions comprise of rental collection, payment, building maintenance, services condition, insurance policy and many more. Selling and marketing are also one of property management functions. Marketing involves several parties such as estate agents, home owners, developers, lawyers and legal companies.