

Incorporation of Building Information Models into Land Administration Systems

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Abstract:

Architecture, Engineering and Construction professionals predominantly use the Building Information Model (BIM), which is a source of information related to spatial and semantic characteristics of the buildings. BIM is used to depict the planning, design, construction and operation stages of the building in 3D. BIM has the potential to assist land administration systems to efficiently manage ownership information in three dimensions. Therefore, there is a need to evaluate the possibility of integrating BIM into land administration systems where the data is predominantly 2D. In this research, data models for both BIM and the cadastre will be evaluated and then challenges and requirements regarding the incorporation of BIM into the cadastral data models will be investigated.

Introduction

Urbanisation and growth of population in metropolitan areas have recently resulted in substantial increase in development of high-rise buildings, utility networks and infrastructure facilities. This means that there are multiple uses of the space above or below the land in urban environments. Therefore, there is a need to improve current cadastral data models to manage land information in three dimensions and, as a consequence, enhance efficiency of current land administration systems. In this research, BIMs are considered as a potential contributing solution for practical possibility of managing 3D land information systems in more efficient way.

Research Problem

There is no an integrated spatial data model which utilizes the advantages of BIM data model to incorporate three-dimensional property information into land administration systems.

Research Hypothesis

Incorporation of BIM into land administration systems can improve the efficiency of these systems in managing ownership information in dense urban environments with high-rise complex buildings.

Research Objectives

The objectives identified in this research are:

- 1- To study BIM concepts, data models and standards and, in particular, gain knowledge of IFC data models
- 2- To study the concept of 3D cadastre and identify case studies which represent different 3D situations
- 3- To establish mechanisms to distinguish between unnecessary and essential information in BIM for land administration systems.
- 4- To design and develop an integrated spatial data model based on existing spatial data models for land administration and BIM.
- 5- To implement a prototype system for testing the developed data model based on the identified case studies.

