POZNAN UNIVERSITY OF TECHNOLOGY
FACULTY OF ARCHITECTURE

DOCTORAL DISSERTATION

Application Research of Simulation and Evaluation Based on BIM Technology in Urban Design

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Abstract

Cities are developing rapidly, the drawbacks of urban design issues are increasingly show, sustainable urban design has become the most significant demand for urban development. However, traditional urban design methods have been brutal to meet this purpose. The development and mature application of BIM technology provide an opportunity to solve this problem. This dissertation introduces the application process of BIM-based technology in urban design projects and profoundly analyzes the application methods in urban design. Researches how the BIM technology applications will make urban design more rational and standardized.

Building information model (BIM) is changing the entire building environment. Customers, professional designers, including contractors and manufacturers in the construction industry supply chain, want to seize the opportunities brought by BIM. Buildings and architectural environments are becoming more and more digitized, using computer data more and more. The use of BIM helped and facilitated this transformation, providing strong support for the digital industry, emphasizing the use of shareable building information to support better creation of the public domain. BIM can help achieve better results at all construction project life cycle stages and achieve sustainable building design. BIM is helping everyone move into the emerging urban planning and infrastructure industry, providing people and society with the value foundation they need. BIM data can quickly generate design options and better implement design options. Simulate and analysis evaluation early in the urban design phase to get better design results.

This dissertation focuses on exploring and researching the application, technology, and professional practice of BIM in urban design. Through theoretical analysis and case studies, the method of BIM technology to optimize urban design is discussed.

By studying the digital tools used in BIM projects, the dissertation emphasizes the "information" in building information models and the possibilities provided by data-rich models in urban design.

Using survey research on the innovative implementation of BIM in urban design, the views of professional designers on the applicability and fields of BIM use in urban design were investigated.

As a result, the research study conducted in the dissertation answered the formulated research questions:

What are the research trends in the use of BIM in urban design?

Can BIM technology be useful in urban design as in architecture design?

In which elements of urbanism can BIM find effective application?

Will this BIM-based design technology completely replace traditional urban design methods?