

BIM-BASED BUILDING PERMIT PROCEDURES USING DECISION MAKING METHODS

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ABSTRACT

The Building Information Modeling (BIM) methodology deals with the digitalization of the whole construction process and the collaboration of all involved people. In German construction supervision authorities, a conventional and decentralized working with paper media is used and is related to challenges in processing times and communication. Several scientific approaches provide opportunities to check a variety criteria automatically. To define basis for an international standard all process criteria and parameters should be identified in detail. An empirical study to analyze the high potential of BIM in building supervision authorities is proposed. This approach suggests the scientific design of an empirical study and first results. The variety of how to practice decision procedures in building authorities should be carried out. The analyzation should be shown as a descriptive model based on decision analysis methods.

1 INTRODUCTION

Building Information Modeling (BIM) is a dynamically developing issue in the Architecture, Engineering and Construction (AEC) industry. The National BIM Standard Project Committee defines a Building Information Model as a digital representation of physical and functional characteristics of a facility and a shared knowledge resource for information about a facility, forming a reliable basis for decisions during its life cycle; defined as existing from earliest conception to demolition (NIBS 2007). However, the subject presented in this research proposal is focused on the phase of applying and granting a building permission.

A previous research conducted in the US found out that over 80 percent of the existing code professional workforce is planning on retiring within the next 15 years (NIBS 2014). Therefore, there exists a special demand in the United States to optimize the building permit process. A similar trend can be noticed in different German building supervision authorities, which is proved by several personal interviews.

2 CURRENT WORK

This research poster obtains an overview of the methodology used for investigating BIM-based building permit procedures using decision making methods. The methodology is shown in figure 1. Therefore, a descriptive model, which visualize current processes within building authorities, is required.

The descriptive model describes the decisions which are needed for granting a building permit. In this research proposal, the descriptive model bases on different influences: (1) a literature review and (2) an empirical study. The literature review focusses on regulations and laws which provide the algorithmic and rational explanation. The empirical study aims to identify heuristic and intuitive decisions by the professional workforce in building authorities. For a detailed understanding of current processes, qualitative interviews with experts (academic, industry and authority members in AEC sector) are carried out and evaluated. To figure out decision processes according to assessing a building approval a BIM model simulates

certain critical situations while the interviews. The interviewer use a BIM model to explain and to visualize and to evaluate benefits as well. This simulation supports to understand the purpose of certain issues and relevancy for individual building projects. For example, the BIM model demonstrates the interviewee a compensation of distance area to the neighbor area or a special fire protection situation.

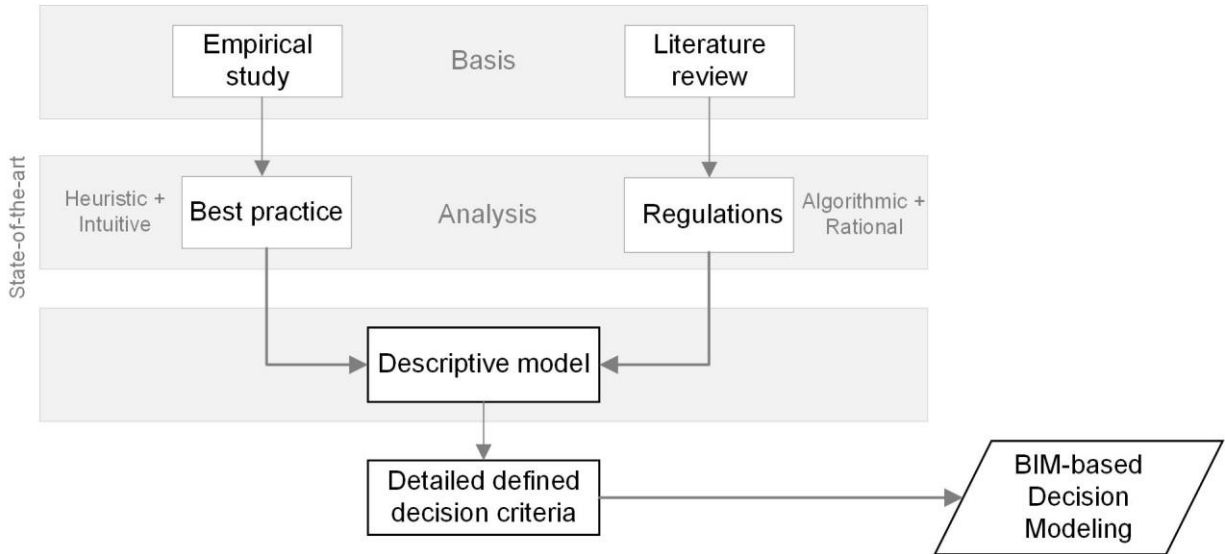


Figure 1 - Methodology of developing the descriptive model.

3 CONCLUSION AND FUTURE WORK

The proposed descriptive model aims to optimize the building permit processes and serves as a basis for an international standard using BIM. Results of the empirical study describe (a) differences/issues in structure, organization and processes within several building supervision authorities and (b) the variety of criteria to be proofed and allows an overview of assessment scopes depending on authority staff.

Therefore, further investigation of detailed building permit decision criteria is required. Related to an international understanding, the descriptive model needs to be evaluated and extended in a further level of interviews. Subsequently, according to the acquired knowledge, investigations for a BIM-based implementation of building permit criteria and processes will be able to follow.

REFERENCES

- NIBS (National Institute of Building Sciences) 2007. "National Building Information Modeling Standard, Version 1 – Part 1: Overview, Principles, and Methodologies".
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