Zukunft Bau

SUMMARY

Title

"Methodology and tools for improving work planning in small and medium-sized enterprises in the construction industry using Building Information Modeling"

Starting situation

Currently, the focus of digitisation in the construction industry is the application of the BIM method. In order to optimize the efficiency of the construction industry and to strengthen the competitiveness of construction companies, the application of the BIM method is indispensable not only during the planning phase but also during construction. SMEs, which make up 99% of construction companies, need to be made familiar with the method in order to ensure its consistent application.

Subject of the research project

The research project focusses on work planning processes in SMEs. SMEs play a special role within the construction industry, as they generate 88% of the total turnover of the German construction industry (as of 2014). Due to the importance of SMEs, the affiliation of companies to the BIM method is being pursued. The aim of the analysis is the development of a so-called data viewer. It is intended to make it easier for SMEs to integrate the BIM method by presenting the information relevant to them from a data model in a Web application. SMEs should neither have to purchase their own software products nor have to work in a model themselves. In the form of a demonstrator, the research project for selected trades will show how the information required for SMEs can be pre-filtered from a building data model in a web-based application.

To develop the interface between the work planning of SMEs and a data model, information was collected on how the work planning is currently put into practice in the companies and on the status of the application of the BIM method. The developed empirical study on crafts businesses aimed to find out which work planning processes are currently being implemented in the enterprises, which data is required for work planning and to what extent model-oriented work is already being carried out in the enterprises. The questionnaire was coordinated with the practice partners and tested in a pre-test phase. The work planning processes already modeled in the process modelling software by the research project BIM in the construction phase were analysed for the survey and used as a basis for the survey. In order to obtain further findings on work planning and the BIM method for crafts businesses in addition to the survey, the practice partners were consulted to validate the results of the evaluation.

In order to describe the development requirements of a data viewer, the market was analyzed with regard to available software for reading data from a digital building model. Here it was examined to what extent such offers already exist in parts and whether they were implemented accordingly for the needs of the craftsmen. The information provided by the survey participants was also taken into account for this review.

The results of the interviews and survey as well as the market analysis served as a basis to determine how the data viewer should be programmed to be accepted by the companies and brings them benefit. These requirements were recorded in a specification sheet and made available for programming the interface.

The interface, the data viewer, was programmed on the basis of the requirements from the specifications. The software identifies the data from building models relevant for the work planning of craft businesses and displays it in tabular form for export. This enables craft businesses to evaluate and use the information relevant to them with software that is already in operation. OneTools was involved in the research project as a practice partner to support the programming of the interface.

Finally, the developed data viewer was applied to an example model and selected sample trades to prove its functionality. Revealed limitations and errors were corrected accordingly and a demonstrator was made available for further development. The combination of database and data viewer makes data consistency from planning to construction transparent and comprehensible for SMEs.

The results of the project will be published on the website www.biminstitut.de and other communication channels and thus made available to the public.

Conclusion

The survey of SMEs in the construction industry showed that the main barriers to the use of the BIM method are the costs of acquiring software and training employees and the time factor required to do so. These aspects were taken into account when implementing the data viewer. SMEs can obtain information for their trade from a data model with the help of the data viewer without having to buy a software product themselves. The information is pre-filtered according to the trade and can be exported to the familiar programs of SMEs. Further development of the demonstrator into a market-ready solution can make it much easier for SMEs to work with the BIM method.

Key data

Short title:	BIM-supported work planning in SMEs
Researchers / Project leader:	Univ.-Prof. Dr-Ing. Manfred Helmus Dr.-Ing. Dipl. Wirtsch.-Ing. Anica Meins-Becker Agnes Kelm, M.Sc Brian Klusmann, M.Sc Carla Pütz, M.Sc.
Overall cost:	89.957,98 €
Federal subsidy:	62.057,98 €
Project term:	20 month + 3 month cost-neutral extension

IMAGES:

5 - 7 Druckbare Bilddaten als **eigene Datei** (*.tif, *.bmp, ...) mit der Auflösung von mind. 300 dpi in der Abbildungsgröße (z.B. Breite 10 - 20cm). Bilder frei von Rechten Dritter.
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