Future Building

STRUCTURE SHORT REPORT

Title

BIM-based building with RFID:
Use of consistent information for RFID-controlled planning, execution and management processes.

Inducement/ Initial Situation

The ARGE RFIDimBau has been involved in recording, monitoring, controlling and documenting processes using RFID technology since 2006. As a result of the previous subprojects, applications have been developed separately but in a coordinated manner. For a continuous, digital data flow and increased sustainability in data management over all life cycle phases, it is necessary to develop an overall concept.

Subject of the research project

The solutions developed so far by the research institutions were coordinated and independently designed.
In order to ensure a continuous and cross-process recording, control, management and documentation of processes along the value-added chain, an overall concept for the interfaces between various RFID-related demonstration applications of ARGE RFIDimBau from the last project phases and existing CAD, construction progress planning and AVA applications must be defined.
Only development of standards for data storage, data exchange and the necessary software interfaces by means of a cross-project use of so far recorded process data can be achieved.
The implementation of this overall concept forms the basis for the extended documentation of the process data and a continuous flow of information along the value chain over the life cycle of a building.
In addition to increasing efficiency in conventional processes, the entirety of the available data makes it possible to realize further new application possibilities for the entire life cycle. These include rapid pollutant checks by including component properties, location and navigation functions for building operators and users on the basis of digital building data, refurbishment concepts and more.
Interfaces for linking data must be developed in view of the fact that in practice there is an increasing trend towards Building Information Modeling (BIM). This creates considerable possibilities for object-oriented and consistent networking of building-related data.
The development of standards also allows the information flow to be optimized over the entire life cycle of a building.
For example, by linking the virtual planning world with the physical real world, additional process data from construction logistics and production can be documented in full, from construction logistics to construction in DEBt.
Additionally generated, dynamic data, e.g. regarding the required proofs for EnEV and sustainable building, can be documented in digital building models.

Both digital building models and intelligent building components can therefore contain maintenance and building logistics data in addition to building production and usage data. Master, event and condition data for objects of a building can be networked in an object-oriented, common structure. Even sensor data can be integrated.
The sole derivation of basics and the subsequent development of standards and interfaces will not establish the project idea and the applications or applications developed from it in practice.
For this reason, a concept was developed on how the use of RFID technology in the construction industry can be further disseminated with the help of practice partners and associations. The public relations work resulting from this concept plays a major role in project work.
An important part of the public relations concept is the development and equipment of a demonstration module. Selected applications are presented in various ways in a specially designed room module:

- Through posters and visual objects, visitors can gain an overview of how RFID technology works and of the project ideas. The contents are processed in a way that they are also understandable for laymen.
- The demonstration module also shows a film developed especially for the project, which illustrates and deepens the ideas.
- The most important element is to be the own experience of RFID technology in the building industry. Various hand-held readers, elements tagged with transponders and matching applications will be on display so that visitors can try out the individual applications for themselves and experience them in practice.
- The combination of these three modules allows a wide variety of visitor groups, from students and craftsmen to the management board of construction companies, to gain access to the ideas and developments of ARGE RFIDimBau and to experience the benefits.

Conclusion

As part of the joint project " BIM-based Building with RFID technology", standardization requirements were developed within an overall concept for interlocking existing process data and making it possible to link the data to the IT infrastructures and existing classification systems and product catalogs used in practice. On the basis of selected example applications the developed solution proposals were demonstrated in a practical way. The research project was supported by the Hauptverband der Deutschen Bauindustrie (HDB) and the Zentralverband Deutsches Baugewerbe (ZDB). Furthermore, the associations and practice partners served as multipliers in the dissemination and establishment of the results.

Key Data

Short title: BIM-based Building with RFID

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Total costs: 1.782.516,37€

Proportion of federal subsidy: 1.031.165,87 €

Project duration: 44 month

ILLUSTRATIONS:

5 - 7 printable images as **separate file** (*.tif, *.bmp,...) with a resolution of at least 300 dpi in the image size (e.g. width 10 - 20cm). Images free of third party rights.

Picture credits: ARGE RFIDimBau

Picture 1: Bild 1.jpg

Caption: View of the demonstration module from outside

Picture 2: Bild 2.jpg

Caption: Stations in the demonstration module

Picture 3: Bild 3.jpg

Caption: Exterior design of demonstration module

Picture 4: Bild 4.jpg

Caption: Exterior design of demonstration module with location system

Picture 5: Bild 5.jpg

Caption: Exhibition of the demonstration module at the first use at the Bautec 2014 in Berlin, interior view 1

Picture 6: Bild 6.jpg

Caption: Exhibition of the demonstration module during initial use at the Bautec 2014 in Berlin, interior view 2