COMPUTER-AIDED CIVIL AND INFRASTRUCTURE ENGINEERING

Ontologies to Support RFID-Based Link between Virtual Models and Construction Components

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Abstract

Abstract: *Virtual models have in recent years proven their worth in practice in building design. Today, virtual models of a complete building project are often created before the project is carried out in practice. The immediate advantages of this new working process are great; it reduces the number of errors, it gives a better production basis, and it improves clarity and enhances communication compared to traditional 2D drafting methods. However, there is still much unutilized potential in the virtual models, especially for use in the construction and operation phases. A digital link between the virtual models and the physical components in the construction process can improve the information handling and sharing in construction and building operation management. Such a link can be created by means of Radio Frequency Identification (RFID) technology. Ontologies play an important role as the foundation for information sharing between trading partners, reuse of data from one phase in construction to the next, integration of process and product models with enterprise resource planning (ERP) systems, easy access of information, communication of data through networks, reading of data stored in electronic tags, etc. This article reviews existing ontologies relevant in relation to creating such a digital link between virtual models and the physical components. The ontologies are reviewed from an ontology consumer (system developer) point of view. The ontologies are categorized according to their applicability to specification of technical services, resources, organizational relations, business processes, and overall frameworks for ontology descriptions and their relations. It is concluded, with a few modifications for industrial use, the technical service and resource ontologies are applicable and that the meta-, organizational, and business process ontologies need further development and industrial maturity to be applicable for use in system development.*

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