

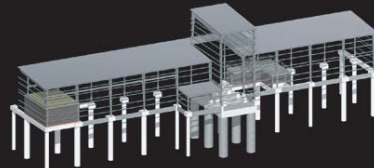
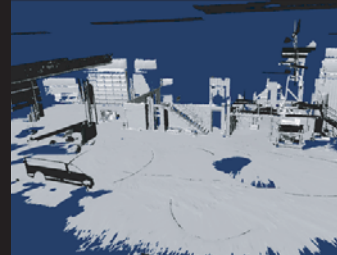
Construction projects commonly involve a large number of participants from various domains.

Integrating their different views into a single project model, or supporting information exchange between alternative representations is the focus of this research. We aim to develop a representation structure that includes:

- (i) a model of the as-built information; and
- (ii) provides a flexible decomposition of the product model so as to incorporate the different views of the specialty trades at any given point of time.

In exploring a flexible representation schema, we are proposing to test the capabilities, and employ a framework for representational flexibility, named "*sorts*", which define sets of similar entities.

Work on sorts is being developed in collaboration with professors Rudi Stouffs at Delft University of Technology and Ramesh Krishnamurti at Carnegie Mellon University and their research students.



We use compositions of primitive data types in a constructive approach to model the representational schema, to be able to compare representational structures with respect to scope and coverage,. A *sort* is defined as a complex structure that consists of compositions of other *sorts*. At a base level, a *sort* may be defined as a set of similar data element. A comparison with other sorts addresses a comparison of respective data types of a *sort*, which is defined in terms of *primitive sorts*; the *sorts* combine to construct a *composite sort* under a compositional operation.

In our case studies, importance is given to capturing dynamic changes in construction including update, addition, and removal of data from the project model, and presenting an effective representation for the specific needs of the various experts. The idea of individual needs, a complex project model and its representation emphasize the important of user interaction. Our research into flexible design representation for construction focuses on database forms, queries, and user interaction. These include integrating and maximizing the use of collected data sets from embedded sensors and laser scanning.