Proposal for 2x view definitions

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Overview

The purpose of this document is to briefly describe the most important view definitions made for the IFC model prior to the IFC2x release.

The goal of the IAI is to unite the different implementation streams that have existed in the past; for this to happen the conditions must be such that all implementers have a proper incentive to implement IFC 2x. To reach this goal it is important to define views that meet the needs of various implementers. The views defined for IFC 2.0 can be used as a starting point.

The BLIS project has defined several views for the IFC R2.0, of these views the 'Architectural design to quantity takeoff" and "Architectural design to Thermal load calculations / HVAC system design" can be considered to be the most important ones. These views have been approved and implemented by architectural design software (Graphisoft and Microsoft) and analysis software (Timberline, LBNL, PNNL, Granlund, YIT, Skanska, Solibri etc.). The IAI approved certification for the R2.0 implementations was made based on these views.

During the development of the views great care was taken to make them realistic; it is possible to implement them in existing software using existing releases of the IFC model. Furthermore the views have been designed such that they can be applied internationally.

Construction types

The key concept used in these views is 'construction types'. Since the goal of the views is to enable data exchange between dissimilar applications (e.g. CAD and quantity takeoff) no common view of e.g. a wall construction exists. CAD programs focus on the visual representation of a wall and quantity takeoff applications on the composition and work tasks for the same wall. However, both applications deal with the same wall instances and design teams in projects have a common understanding about the construction types used in a project.

In the views the construction type is communicated using a construction type tag, e.g. 'EW-1' for external wall type one. When the designer creates the model he/she knows the wall type and is easily able to include this information in the model. When the model is used on the analysis side programs can map the construction type to their internal databases; quantity takeoff to a wall assembly and thermal analysis to specific thermal properties.

Additional information in the model, e.g. information about wall layers, can be used to verify the construction type or for an educated guess about the construction type in case the type tag is missing.

It is important to note, that the view does not contain any library of construction types, just the mechanism for communicating the construction type. Typically construction types are defined on a project-to-project basis, in fact in some documents they are referred to as 'project types'

Further information can be found in the BLIS document IFCR2_ProjectTypes_000714_jh.pdf

Arch. Design to Quantity Takeoff

The 'Arch. Design to Quantity Takeoff' view defines the information that is exchanged between architectural design applications and quantity takeoff applications. Quantity takeoff applications usually use the quantity data they imported to perform a cost estimate, however information about the cost estimate is not part of this view. The BLIS project has also defined the 'HVAC Design to Quantity Takeoff' view, which is quite similar, but used by different kind of software.

The goal of the view is to transfer relevant data between the applications. This data can be divided into 3 categories.

Category	Example
Identification	The wall's construction type is EW-1
Quantity	The length of the wall is 7.6m and height 3.2m
Location	The wall is located on the Ground Floor

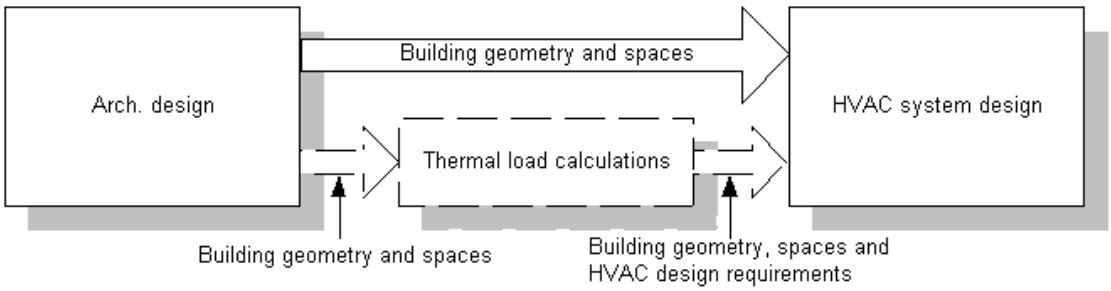
The view can be used to communicate the quantities of the following object types.

Wall, door, window, slab (both floor and roof), column, beam and roof

Further information can be found in the BLIS view definitions and detailed background considerations in the BLIS document IFCR2_QuantityTakeoff_991106_jh.pdf

Arch. design to Thermal load calculations / HVAC system design

This view enables several business cases. The decision to define only one view came from the consideration that all these business cases set the same requirements to the architectural design applications.



- Building geometry and spaces from the architectural design application are used as a starting point for the HVAC design

- Building geometry and spaces from the architectural design application are used for calculating requirements for the HVAC design (e.g. maximum air flow rates for spaces). The combined information from these two applications is used as a starting point for the HVAC design.
- Building geometry and spaces from the architectural design application are used for thermal load, energy and building life cycle analysis.

On the technical side this view is very similar to the quantity takeoff view; the important difference is the additional requirement to support spaces and space boundaries. Columns and beams on the other hand are not very relevant for this view.

Further information can be found in the BLIS view definitions.

Other views

Supporting the two major views described above brings us 90% towards the goal of supporting also the following views

- Pre-design to architectural design (e.g. space program to CAD)
- Architectural design to facility management
- Architectural design to security analysis
- Clash detection between architectural design and HVAC design.
- And in some limited, but important areas, also building code checking, such as fire safety analysis.

However, it is important to concentrate on a few high value views and to implement them well. Once the major views are stable it is relatively easy to design and add new views.