The IFC (or How Much Does That Shirt Cost?)

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If you have become involved with Building Information Modeling (BIM) at your site, you have probably encountered the acronym IFC. So, what are IFCs and why should you care about them?

In the real world, a building consists of components (e.g., doors, walls, windows, etc.) that are made up of other components (e.g., a "door" is made of an opening, a frame, the specific door, and the door hardware). The Industry Foundation Classes (IFC) can be used in an ASCII file to contain a complete facility model, including its geometry, attributes, and relationships. Objects in the file can be composed of other objects (such as the door example) or can be related to other objects (e.g., a door in a wall goes from one room into another). The relationships allow various pieces of Object information to be tied together, making the IFC objects extendable. An IFC Object has associated sets of attributes that can be related to the Object by a "Relationship Class" that acts as an intelligent link to connect the two. Groups of attributes, called property sets, contain individual pieces of data and can be attached to objects for specific purposes. This attached information could be considered similar to a price tag on a shirt in a store.

When you go to a store and buy a shirt, the sales clerk scans the price tag attached to the shirt. The price tag is generally just a piece of paper with some ink. Although it adds no sales appeal to the shirt or value for the customer, it contains crucial information to both the customer and the business. Scanning the number on the price tag quickly finds the price, notifies inventory that the stock of that particular item has decreased by one, notifies the sales register of the amount as well as any deductions for discounted or sale prices, and then becomes part of the operational data (i.e., a certain number of these shirts were sold this day or during this period or by this salesperson).

The BIM Object can have multiple "price tags" or property sets such as CAD symbology (i.e., layer name, color, etc.), materials, cost estimating, specification, or maintenance. The "Pset_Draughting" property set contains data about the original creator and software as well as the layer name and the color in an RGB value. The Construction Operations Building Information Exchange (COBIE) data will consist of property sets linked to objects. A BIM Object can be a building, a floor, a door, a wall, a space, a tree, or any other item that has geometry and attribution. In contrast, IFC Objects can be tangible (e.g., walls, columns, doors, chairs), physical (building, site, space), or conceptual (grids, boundaries), as well as processes, controls and actors. IFC information allows for an object to have additional properties such as required clearances around an electrical panel. Infringement of the panel access space would be flagged during an automated interference check.

A property set can be created for a specific use and applied to a specific object, a type of object (such as doors or windows), or a selected group of objects. When such objects as computers, furniture, or equipment need to be tracked with bar code numbers, these objects can be created in BIM, attributed with the bar codes, and linked to a database.

The BIM model hierarchy begins with a site location from which the building location is established. Projects are under way to allow this site location to be georeferenced. Since the locations of all objects in the building are referenced to the building's location, this would give the entire model a real-world location, and would potentially allow

searching through multiple files of attribute information based upon that location. The building location is in relation to the site location where multiple buildings can be assigned to a single site.

In short, the IFC information is still in its infancy in terms of application and vendor support, but is growing rapidly. The IFC has much potential, and its uses are just beginning to be tapped.