

BIM NEWSLETTER

(AEC NEWS & STORIES)



Highlights

- Transforming AEC projects with BIM
- Information Delivery Specification (IDS)
- Role of (IDS) in BIM
- OpenBIM workflow with IFC and IDS
- Nexus Twin Platform(for building permit system)
- Model Quality Assurance and Quality Control (Verifying model content)



Transforming AEC projects with BIM

Government organizations, AEC companies, Facility management and Infrastructure development sectors working with different data formats, standards and methods during the stage of an AECO process (e.g. design, pre-construction, construction and maintenance). That is where the need for unifying all stakeholders around a common standard arises.

OpenBIM supports collaboration and data sharing between diverse applications employing standards that can be used by all, not proprietary “locked” or “closed” protocols. OpenBIM is adhering to international buildingSMART standards and commonly defined work processes.

With openBIM in place, the large network of stakeholders working from Building Design to Infrastructure project can easily send information between systems and tools, leading to a number of benefits that improve cost control and productivity.

openBIM standards



We can classify openBIM standards in " Data Standards, Workflow Standard ".

Open data formats like IFC allow data to be transferred accurately across different software platforms, streamlining design and engineering workflows.

The complexity of modern construction projects requires the use of open standards. Open standards make it easier and more efficient to communicate using data exchange formats such as IFC.

A single project can involve hundreds of stakeholders, from the architect to the company, each of whom must contribute and access data. Needless to say, if that data cannot be easily exchanged or reused during the life cycle of the project, there could be considerable confusion with consequential waste of time and money.

The following belong to the Data Standard

IFC (Industry Foundation Classes), which allows you to catalogue the data that make up an information.

MVD (Model View Definition), which defines which of these datasets need to be exchanged during a communication process and represents a property filter for an IFC file.

In general, a MVD, or "Model View Definition", is a specific implementation level of IFC to describe facilitate a specific use or workflow.

The model view definition determines how you use an IFC file, because it enables a specific data exchange scenario.

Workflow Standard

Integrated design is based on the coexistence of different disciplines and therefore specific models made by different professionals. There may be errors in transmitting the model, and those responsible must be told to resolve them.

It is therefore necessary to define process standards, a set of specifications that indicate the minimum information necessary to achieve all the processes of the entire life cycle of the building. The aim is to increase the effectiveness of communication between the different stakeholders.

The standard workflows include:

BCF (BIM Collaboration Format), which was created to streamline communications and allow the exchange of feedback between professionals.

IDM (Information Delivery Manual), which allows you to standardize the exchange processes between professionals.

How does the IFC work?



According to the “buildingSMART” consortium, IFC is the main tool used for openBIM implementation, “...a universal approach to the collaborative design, realization, and operation of buildings based on open standards and workflows”.

The IFC format is a standardized data model that describes:

The IFC architecture bases its structure on: Semantics, relations, properties

identity and semantics: object, name, function

characteristics: material, colour, properties

relationship between:

objects (e.g., walls, slabs, windows)

abstract concepts (e.g. performance, costing)

processes (e.g., installation, assembly)

people (e.g., owners, designers, contractors, managers).

- The IFC schema itself can be expressed in various file formats, most commonly in STEP Physical Format (SPF or IFC-SPF) but also as XML or a ZIP file.
- IFC-SPF is a text format in the modelling language of express data. It has compact dimensions and is the most used IFC format
- IFC-XML is a format in the extensible markup language, XML. Although XML is a more common programming language, IFC-XML has a larger file size than IFC-SPF and is less used
- IFC-ZIP is a ZIP compressed format of the IFC-SPF file. .ifcZIP file usually compresses a 60-80% .ifc and a 90-95%. ifcXML

Advantages of the IFC

The main advantage offered by the IFC format is to allow collaboration between the various figures involved in the construction process, allowing to exchange information through a standard format. This entails greater control and quality, reduction of errors, reduction of costs, time saving, with consistent data and information in the design, execution, management and maintenance phase.

For data processing objects, vendors can use any kind of BIM software platforms like (Bentley, Autodesk, Telka (a Trimble product), Archicad, BIMx etc, and these objects can export in to IFC.

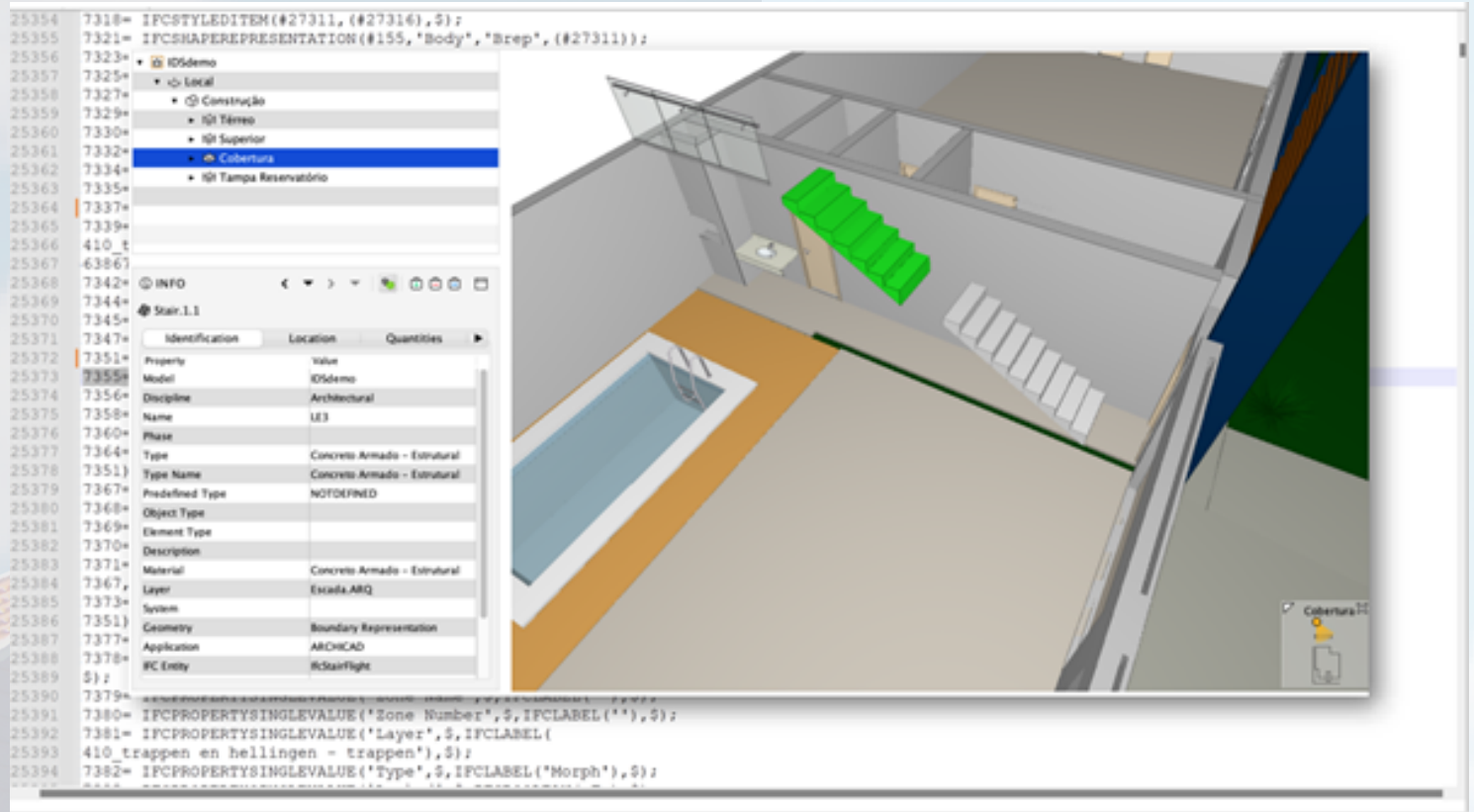
Information Delivery Specification (IDS)

IDS (Information Delivery Specification), which defines Exchange Requirements within an exchange of information based on the use of a BIM model (IDS BIM).



The (IDS) is a standard in development from buildingSMART for defining information requirements in a way that is easily read by humans and interpreted by computers.

This standard in development helps people in the built asset industry to better define their exchange requirements and adds clarity amongst various stakeholders. It ensures asset owners can specify accurately what they want, and allows project participants with a better insight into what they need to deliver. It adds certainty and clarity when used in combination with other standards and services.

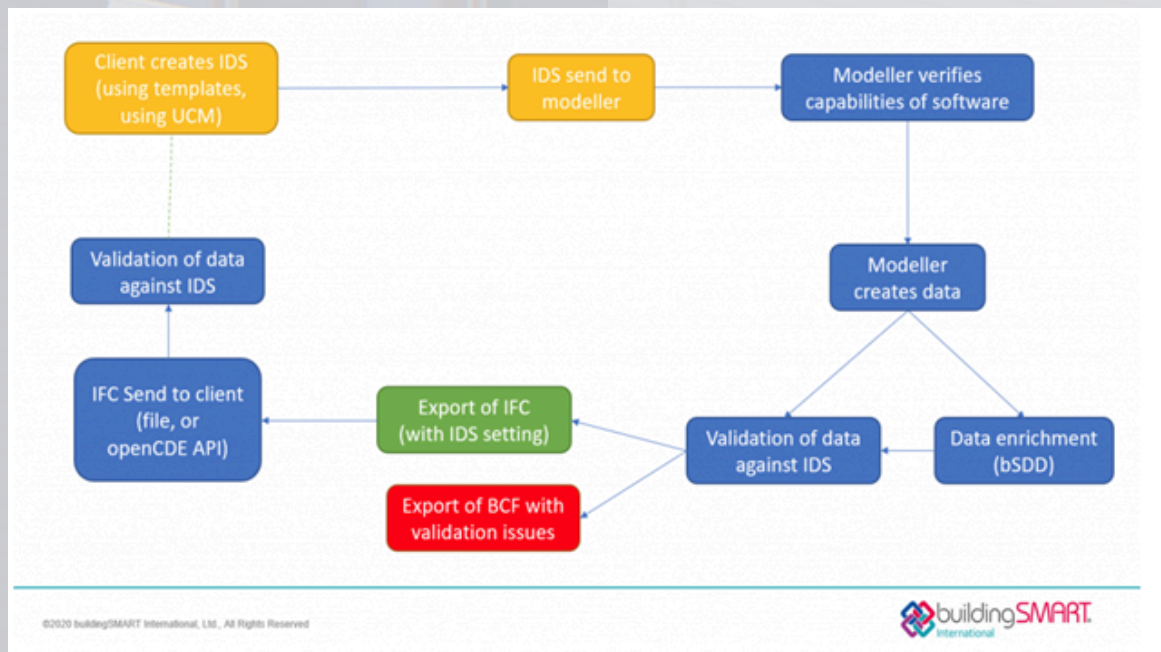


What makes the IDS crucial is that the list can be exported as an .xml file. The IDS then is transformed into a .xml standard code that can be imported into other projects.

Accordingly, in case several projects shall meet the same requirements, the IDS can easily be uploaded and the computer will check whether the requirements for the project are being met.

This standard in the Building Information Modeling (BIM) process aids in ensuring service quality and effective project controls, making it an essential part of any construction project.

OpenBIM workflow with IFC and IDS



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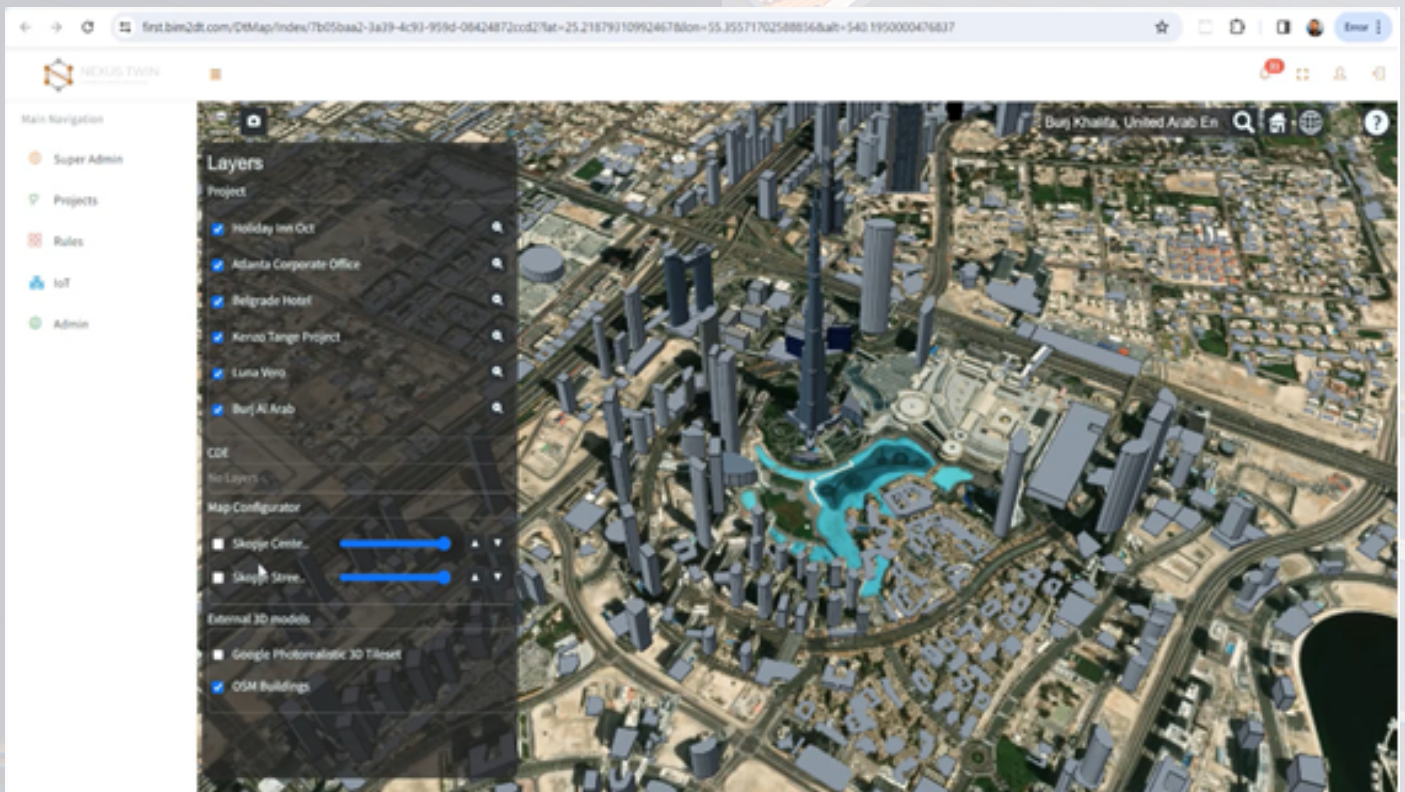
Role of IDS in Building Information Modeling (BIM)

In the context of Building Information Modeling (BIM), IDS plays an instrumental role in facilitating effective information exchange, minimizing errors, and optimizing workflows.

- It provides a structured and standardized approach to define what information should be delivered, how and when, thereby ensuring everyone involved in a project is on the same page.
- IDS facilitates the integration of various building systems such as interior, envelope, structure, and mechanical, electrical and plumbing (MEP) systems. This is crucial in delivering the required performance of a sustainable building.
- IDS in BIM also fosters interoperability and efficient collaboration throughout the lifecycle of a building – from feasibility and conceptual design through to demolition and recycling stages. This is achieved by its machine-readable nature, allowing different software tools to read, understand and work with the data seamlessly.
- Overall, IDS in BIM acts as a bridge between different stakeholders, software tools, and processes involved in a construction project.

Nexus Twin Platform

(Digital Twin Platform for the Building Permit System)



Nexus Twin Platform represents a shared system between permit applicants and permitting engineers that streamlines BIM models submission, validation and review processes.

·With Nexus Twin platform's built-in tools, users can visually inspect each project model individually in a 3D environment or together combined in a georeferenced digital twin environment.

·Digital Twin (DT) viewer shows all of the data at once - .dwg, GIS,IFC, Point-cloud, raster, IoT

·Users can retrieve important data information for each digital twin project model and enhance their decision-making.

·Integrate openBIM API's with ArcGIS API's (to interact 2d feature layers)

By centralizing data and establishing a streamlined workflow, stakeholders can work together by creating a centralized hub for data exchange and collaboration, the openBIM Digital Twin platform empowers stakeholders to work together effectively.

Model Quality Assurance and Quality Control (Verifying model content)

Two kinds of issue: Model health issues, Design issue

Model Health Issues

- Columns and beams not connected to other structural elements at both ends
- Sprinkler heads not connected to a supply line
- Plumbing fixtures that are not connected to supply and drain

Design Issues

- Doorways that lack ADA clearances
- Ramps with slope outside requirements
- Headroom clearances outside required range
- Interior and exterior wall thicknesses are outside expected range
- Overall window area is not within expected range
- Insufficient clearance for service requirements
- Exit pathway exceeds required maximum length
- Accessibility - no opening in false ceiling to repair MEPP
- Spaces without required window area





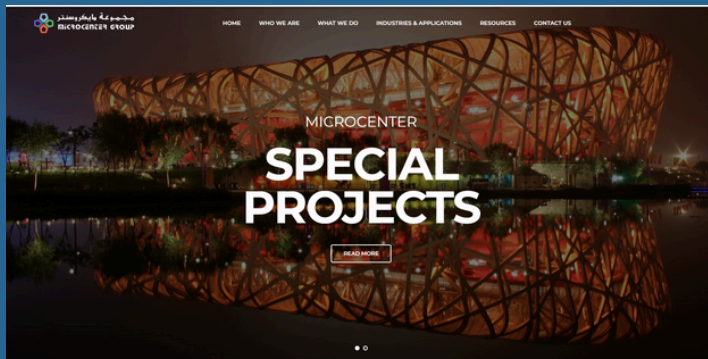
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