buildingSMART International

Activity Proposal

Project Name:

Machine Readable Information Delivery Specifications

AKA "Information Delivery Specification (IDS)"

General Information

Room Governance:

Technical Room (TR)

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1 GLOSSARY

Body	Abbreviation	Short summary
buildingSMART International	bSI	
Expert Panel*	EP	Brings in expert advice during the project, on a voluntary basis, during on average four meetings per year.
Technical Room*	TR	Open forum within bSI responsible for the Technical domain and all developments on IFC within this domain.
Technical Room Project Steering Committee*	TRPSC	Body within the Technical Room responsible for managing the Technical Room projects, meets once a month and Project Lead presents the Project Dashboard during this meeting.
Technical Room Steering Committee*	TRSC	Steers the Technical Room and is responsible for setting out strategy, managing initiatives and liaison with other Rooms and bodies.
International Standardization Organization	ISO	Please follow this link for more information: http://www.iso.org/iso/home.html
Open Geospatial Consortium	OGC	Please follow this link for more information: http://www.opengeospatial.org/
Project Leader	PL	Responsible for managing the project and ensures the project is delivered within budget and on time.
Project Team*	PT	Executes a project based on a project plan and delivers the results according to plan.
Standards Committee**	SC	The senior governance body within bSI overseeing the standards process. It will comprise representatives from members and chapters.
Standards Committee Executive**	SCE	Establishes and manages the bSI standards process and addresses procedural and programmatic issues.
Standards Committee Technical Executive**	SCTE	Provides technical advice to the SC and SCE the bSI standards process and addresses project technical issues.

* For more information please see the buildingSMART International Standards Process. This process describes the manner in which standards and other technical work is created and governed within buildingSMART International. It is available online: http://buildingsmart.org/standards/standards-process/

2   EXECUTIVE SUMMARY

The industry is creating more and more 'Exchange Requirements' in projects. These appear in different names like 'Level of Information Needs', 'Exchange Information Requirements' and 'Information Delivery Manual'. These documents further specify what needs to be inside an IFC dataset ('a file'), but are often described in text and published as pdf. There is no possibility to define or validate machine readable Exchange Requirements.

This project intents to create a machine readable, computer interpretable 'Information Delivery Specification'. This standard can be used by clients to define their requirements, by modelers to validate the data, and by computer systems to automate processes.

The IDS standard brings security, predictability and validation to the IFC exchange workflow.

3   BACKGROUND

3.1   HISTORY

IFCs are defining data structures and semantics. The full IFC Schema has been split into Model View Definitions (MVDs). An MVD can have one or multiple standardized Exchange Requirements. Software tools have implemented the interface to import/export MVDs with those exchange requirements. History has learned that exchange requirements in practice are dynamic, different per project and change in every phase. This is why practitioners have started to add additional constraints and requirements to the standardized MVDs.

3.2   OPPORTUNITY & INDUSTRY NEED

The exchange requirements defined in practice today are almost always in human language, and rarely computer interpretable. Some vendors and large clients have tried to use mvdXML, but the Technical Roadmap (April 2020) has clearly stated its limitations for this use.
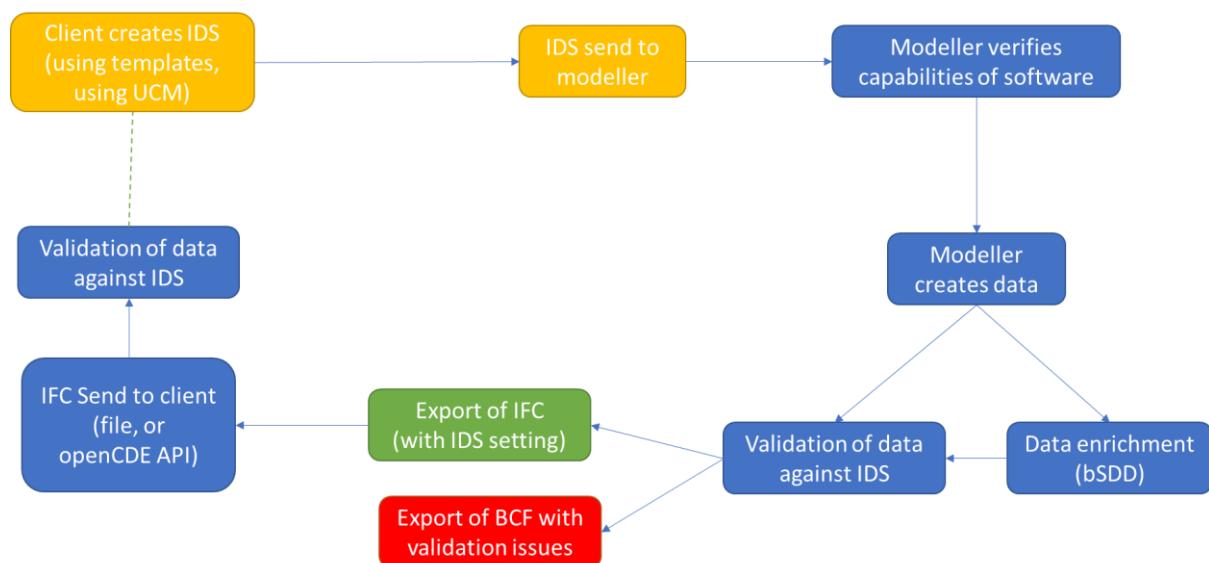

Figure 1: a typical IFC exchange workflow with IDS

Creating a new standard to define 'Information Delivery Specifications' in an easy and simple way will help the industry with facing the most urgent use-cases and thus create a lot of added value for the industry. An easy to define language for exchange requirements can help accelerate the formal definition of requirements between contracted parties. It also brings the ability to automatically validate an IFC dataset against the requirements.

3.3   PROJECT GOVERNANCE

The proposed project will be executed and governed as a buildingSMART International project within the Technical Room. Use-case input will come from the Building Room and Infra Room.

3.4   RELATIONSHIP TO BSI STANDARDS, TECHNICAL WORK, AND TECHNICAL ROADMAP

The Technical Roadmap (April 2020) clearly stated the relation with mvdXML and MVDs. The IDS standard will be the configuration standard of IFC at the different conformance levels.
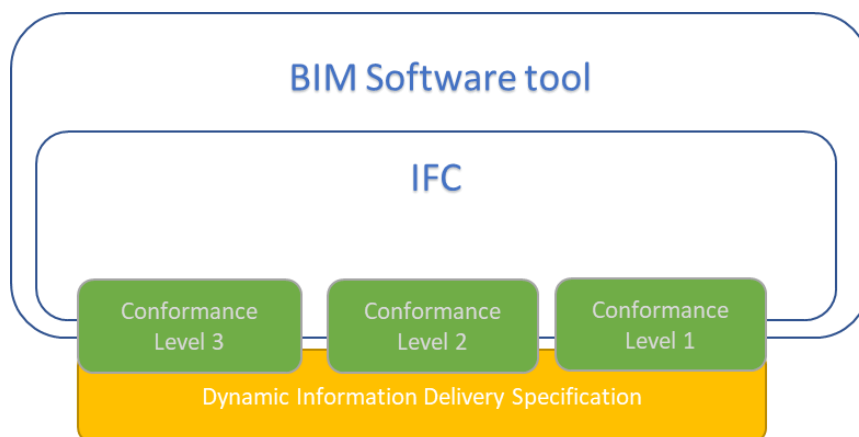

Figure 2: The relation between IFC, Conformance Levels and Dynamic IDS

This initiative is defined as 'vital' in the Technical Roadmap.

The experiences from mvdXML implementations will be used during the development of this project. Also experiences from working with SHACL, bimQL and the Json Based IfcQL will be used.

There will be a prominent place in this project for the use of IFC Property Templates since they are closely related to the use-case. This automatically incorporated the work in CEN on Product Data Templates as well.

First experiments have already been published on https://github.com/buildingSMART/ids. Although this project will be used as an inspiration, by no means it defines the final direction.

The CEN Group working on "Level of Information Needs" (LOIN) has a similar approach. Leader of the LOIN work, Marzia Bolpagni, is committed to the collaboration with buildingSMART through this project. This IDS work will deliver a first version of the standard to facilitate the 'low hanging fruit'. Where this IDS project focusses first on data requirements without geometry definition

requirements, the follow up work in collaboration with CEN/LOIN will expand the IDS use-cases to include definition of geometry richness.

4   SCOPE & OBJECTIVES

4.1   SCOPE STATEMENT

This standard defines a first version of the IDS standard, focusing on the requirements of IFC Entities, Extensions, Classifications and Properties. It assumes exchange of IFC data, but does not fix on a certain syntax of exchange. It includes Classifications and Properties from bSDD, but does not limit itself to bSDD. The IDS Standard will be developed against the beta version of IFC5.

Complex constraints on an instance level are out of scope. Defining the level of detail/development/requirements of geometry is out of scope.

4.2   OBJECTIVES

An IDS will:

- be able to define instance level requirements;
- be able to link to bSDD concepts, properties and domains;
- be easy and simple so users can in principle ("practically") write it in notepad;
- be as non-recursive as possible (so multiple IDSs can be combined by just putting them into one file);
- be able to specify properties and specific classifications;
- be machine readable to be able to load into authoring tools to facilitate both users and software tools to generate, validate and correct mapping of internal data to the desired output;
- be computer interpretable to allow automatic validation of IFC against the requirements;
- be based on industry standard technologies to work with generic parsers;
- be extendable.

4.3   APPROACH

This project will start by collecting several examples and use-cases of exchange requirements in practice. The BIM Base IDS will be one of those, but also the COBie specification, the ICMS (cost management standard) and the requirements some software tools set to be able to define automated simulations. The CEN group working on Level of Information Needs is also providing use-cases.

The team will consist of end-users (clients and data modelers) and implementors.

The found requirements in the use-cases will be classified based on their characteristics. The team will define what will be in scope and out of scope, based on their expertise and experience.

A choice will be made about the syntax of the standard.

After the scoping and choice of syntax, the implementors will make first implementations of the chosen use-cases.

Results from the prototypes will be tested and evaluated. An update of the standard will be proposed and implemented again. These iterations will happen no more than 5 times.

Eventually this will result in a 0.x version of the IDS standard.

4.4 CHALLENGES

Challenges are:

- Getting enough software implementors involved;
- Getting a good balance between simplicity and support of a wide range of use-cases;
- Getting enough funding for the next phase;
- Dealing with resistance from stakeholders that have committed to mvdXML;
- Collaborating with the IFC5 development group.

The requirements and scope of this project are only possible when the changes to IFC that are proposed in the Technical Roadmap are deployed. This project will develop an IDS that works for IFC5.x. There is a strong dependency between the success of this IDS and the characteristics of IFC5.

5 DELIVERABLES

Deliverables after the first phase will be:

- IDS standard 0.x;
- Documentation how to use the standard;
- Examples;
- Prototype implementations;
- Plan for the follow up in phase 2;
- Formal collaboration with the CEN Group on LOIN development.

6 RESOURCES & PROJECT EXECUTION

6.1 RESOURCES & SKILLS

The project is open to participants that want to contribute in a significant way. The project leader, together with the Room Steering Committee evaluates the competence and impact additional participant can bring to the project.

The current team consists of:

- Cyrille Pennavaire (project leader)
- Lex Ransijn & Jeffrey Truijens (use-case input and configurator)
- Marzia Bolpagni (CEN Leader LOIN)
- Ruben de Laat (software implementor)
- Jiri Hietanen (software implementor)
- Ralf Mosler (use-case input)
- Peter Muigg (software implementor)
- Representative from buildingSMART Benelux
- Arie van Kranenburg (software implementor)

- Thomas Krijnen (software implementor)
- Representatives from several buildingSMART Rooms
- Representative from RICS (ICMS use-case)

6.2   PROJECT EXECUTION & MANAGEMENT

The project will be led by the project manager. There will be a formal liaison with CEN group that works on LOIN though Marzia Bolpagni.

Coordination with the Technical Roadmap will be done through Léon van Berlo Coordination with the IFC5 task force will be done through Arie van Kranenburg and Thomas Krijnen. Input about mvdXML comes from Jiri Hietanen. A formal representative from RICS (probably Andrew Knight) will focus on the ICMS use-case.

The project intents to hold 2-weekly web conferences, and 2 monthly meetings on location (if possible, depending on the COVID-19 situation).

7   WORK & TIME SCHEDULE

Work will start on July 1st. The first 2 months are focused on gathering use-cases and scoping. In this period there will also be more clarity about IFC5.

After 2 months a first beta version will be developed. Another 2 months will be taking to make first implementations.

It is intended that the iterations will be finalized around October 2020. The last months are focused on delivering documentation and writing a plan for the second phase. The project will finalize in the first months of 2021.

8   BUDGET & FUNDING

This first phase is based on in-kind contributions from the participants. During this first phase sponsors and supporters will be approached to allocate budget for the second phase.