```
/* a simple Shell sort */
static void groups_sort(struct group_info *group_info)
{
        int base, max, stride;
        int gidsetsize = group_info->ngroups;

        for (stride = 1; stride < gidsetsize; stride = 3 * stride + 1)
                ; /* nothing */
        stride /= 3;

        while (stride) {
                max = gidsetsize - stride;
                for (base = 0; base < max; base++) {
                        int left = base;
                        int right = left + stride;
                        gid_t tmp = GROUP_AT(group_info, right);

                        while (left >= 0 && GROUP_AT(group_info, left) > tmp) {
                                GROUP_AT(group_info, right) =
                                    GROUP_AT(group_info, left);
                                right = left;
                                left -= stride;
                        }
                        GROUP_AT(group_info, right) = tmp;
                }
                stride /= 3;
        }
}
```

IDS: Eierlegende Wollmilchsau?

Štefan Jaud

05.09.2024

BIM Kongress, Gießen

Agenda

IDS: Eierlegende Wollmilchsau?

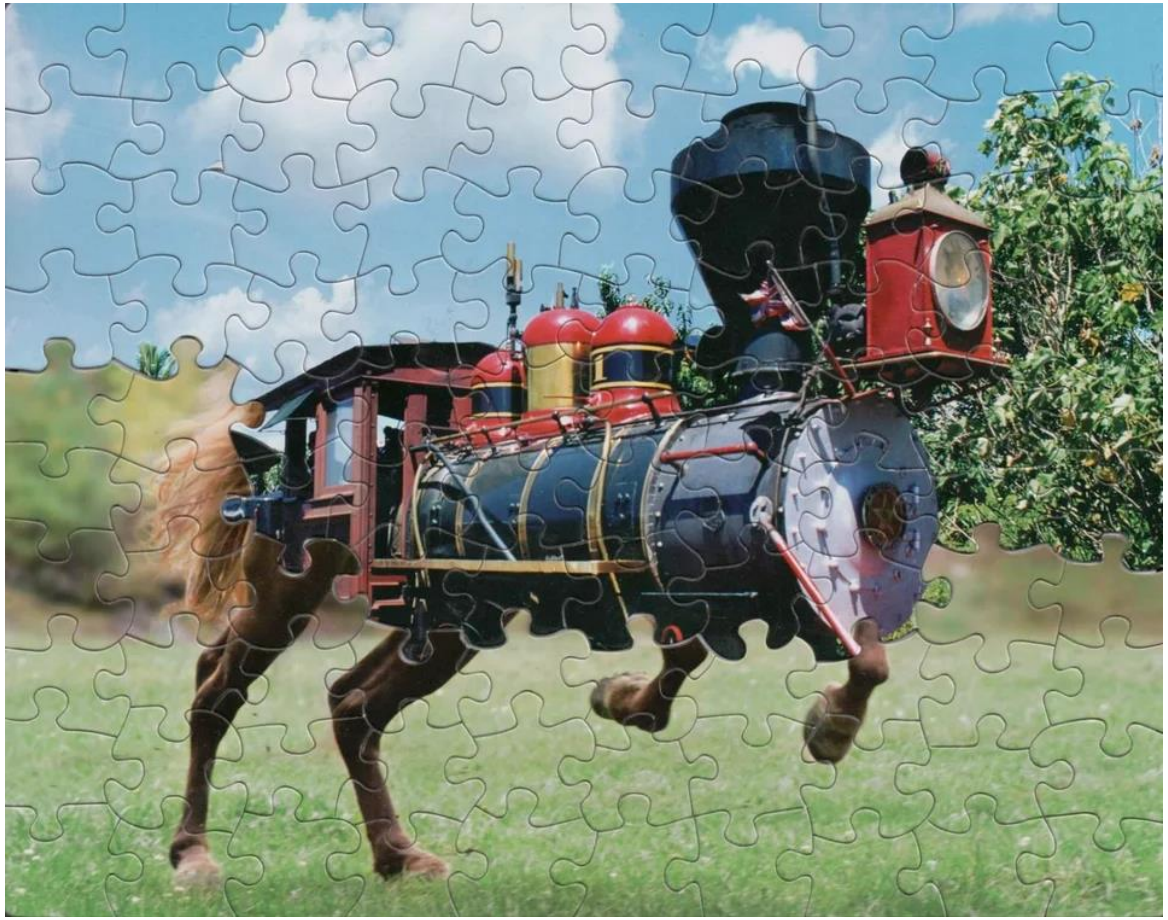
- Motivation
- Was ist IDS?
- Vergleich mit verwandten Methoden
- Fazit

Agenda

IDS: Eierlegende Wollmilchsau?

- Motivation
- Was ist IDS?
- IDS im Kontext
- Fazit

Motivation



Reddit.com (2018)

Übergeordnetes Ziel

The call

We therefore call on all players in the infrastructure and real estate industry to use open standards such as IFC in their projects and business processes to promote sustainable and future-proof development of the industry.

Applying IFC 4.3 for Rail Manifesto (2024)

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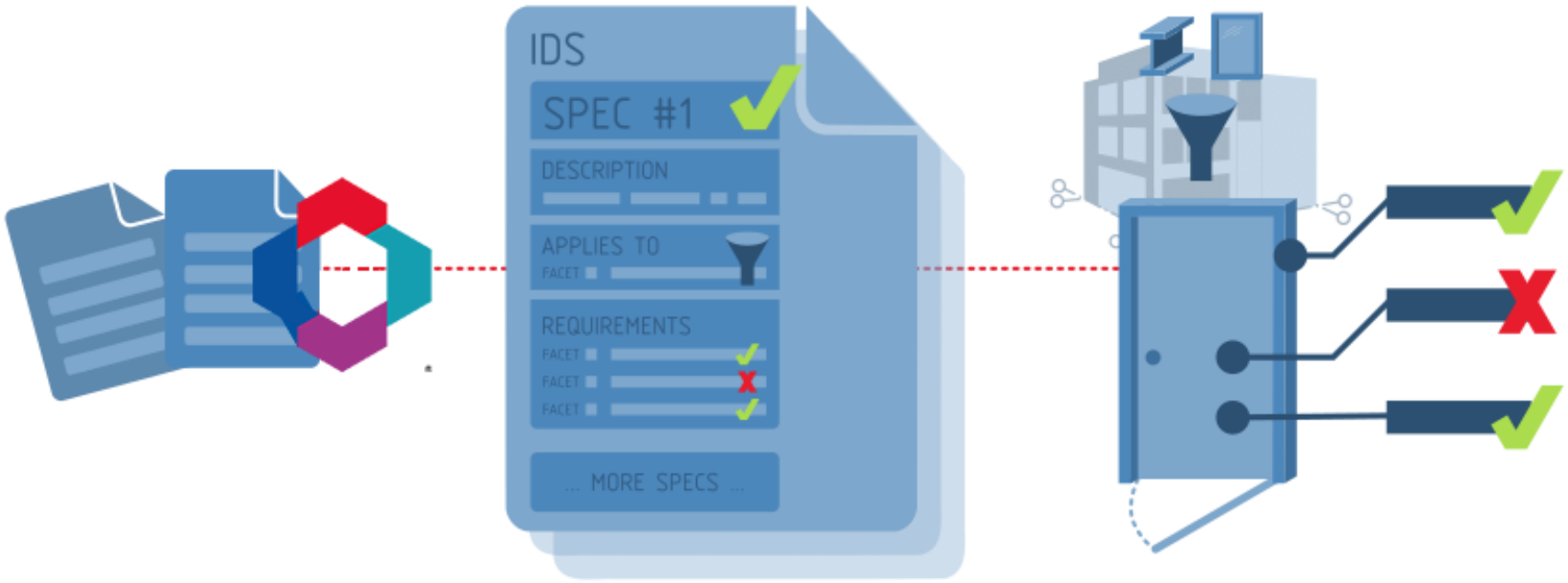
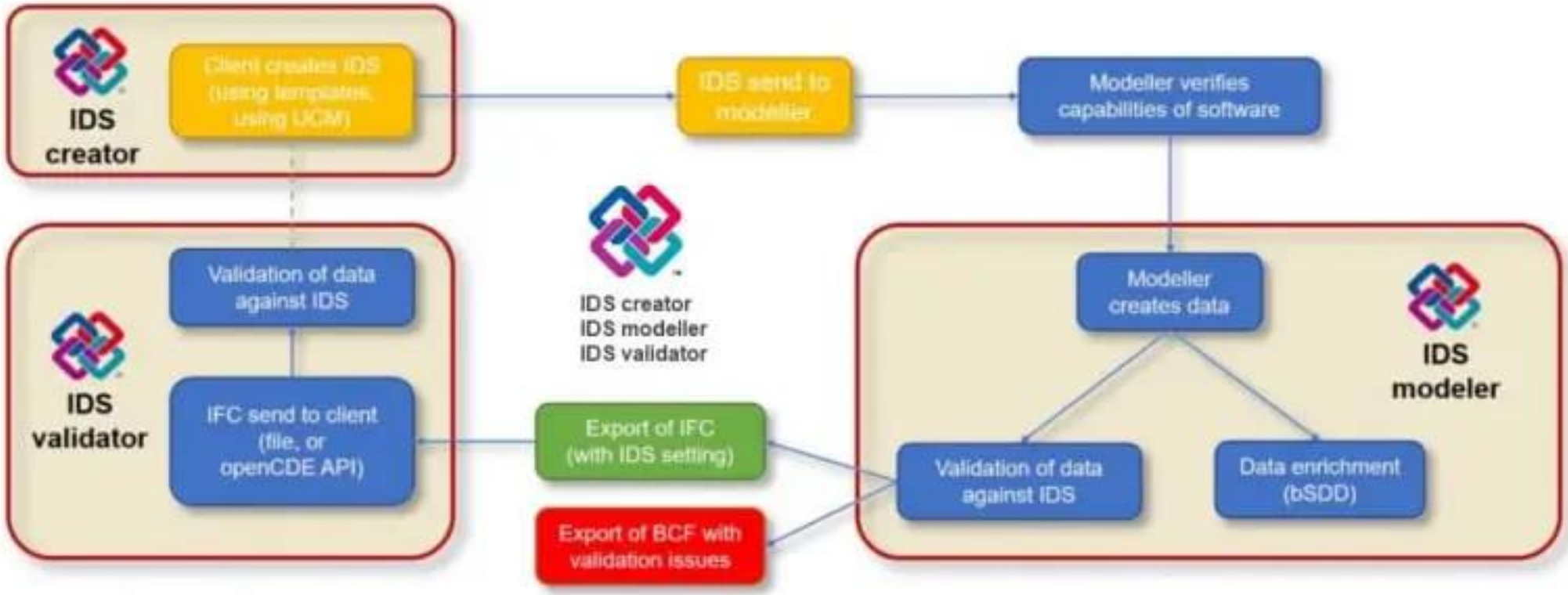
Information Delivery Specification (IDS)



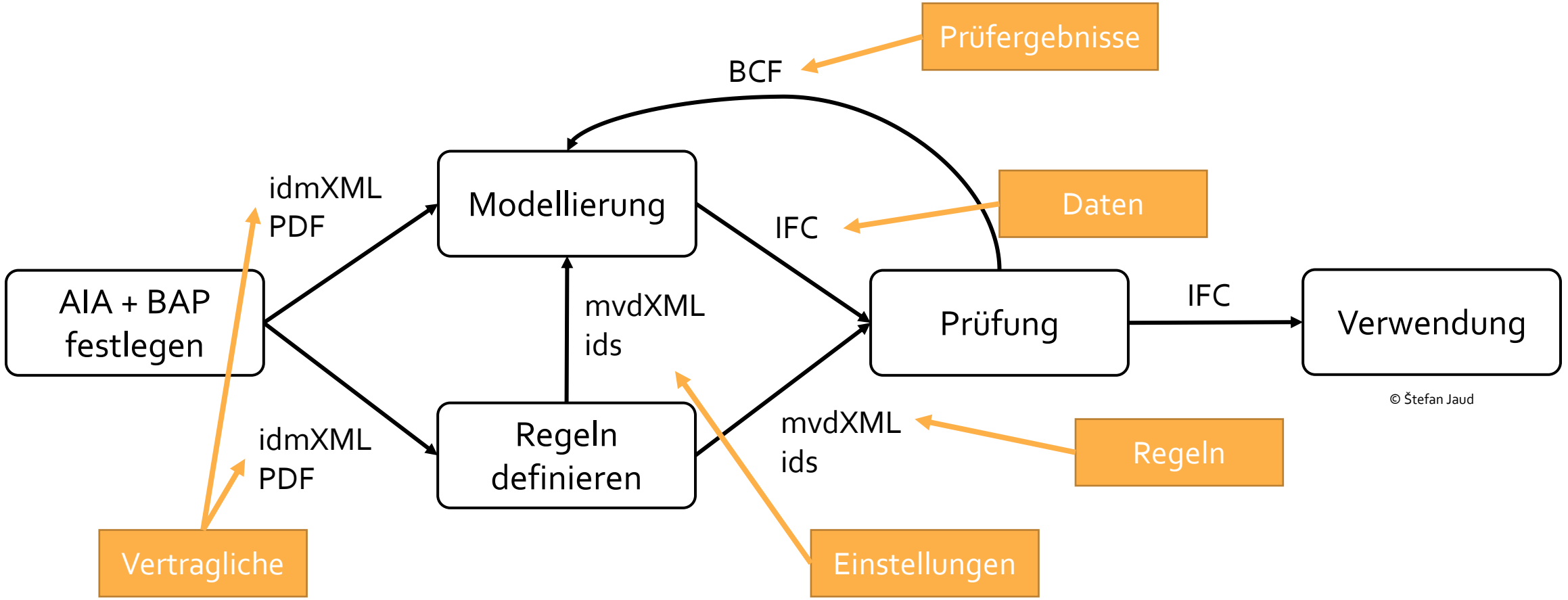
https://github.com/buildingSMART/IDS

IDS Workflow



BibLus ACCA (2024)

IDS Einsatz beim Arbeitsablauf



ids: Datenmodell für IDS

- ids represents the top node of the IDS dataset. It includes the info metadata object as well as multiple specification elements.
- specification represents a collection of constraints for a selection of objects. Additionally, human readable instructions for communication with the end user can be provided.
- applicability defines the rules by which objects are selected from the model with a combination of facets.
- requirements defines the constraint on applicable objects with a combination of facets.
- simpleValue allows to specify specific values, ranges and patterns to check against.

Prüfmöglichkeiten: IDS Facets

Facet Type	Facet Parameters	Example applicability	Example requirement
Entity	**IFC Class** and **Predefined Type**	Applies to "IfcWall" with predefined type of "SHEAR"	Must be an "IfcWall" with a predefined type of "SHEAR"
Attribute	**Name** and **Value**	Applies to elements with the attribute "Name" having the value "W01"	Must have the attribute "Name" with the value "W01"
Classification	**System** and **Value**	Applies to elements classified under "Uniclass 2015" as "EF_25_10_25"	Must have a "Uniclass 2015" classification reference of "EF_25_10_25"
Property	**Property Set**, **Name**, and **Value**	Applies to elements with a property set of "Pset_WallCommon" with a "LoadBearing" property set to "TRUE"	Must have a "Pset_WallCommon" property set with a "LoadBearing" property set to "TRUE"
Material	**Value**	Applies to "concrete" elements	Must have a "concrete" material
Parts	**Entity** and **Relationship**	Applies to elements that are "contained in" an "IfcSpace"	Must be "contained in" an "IfcSpace"

https://github.com/buildingSMART/IDS

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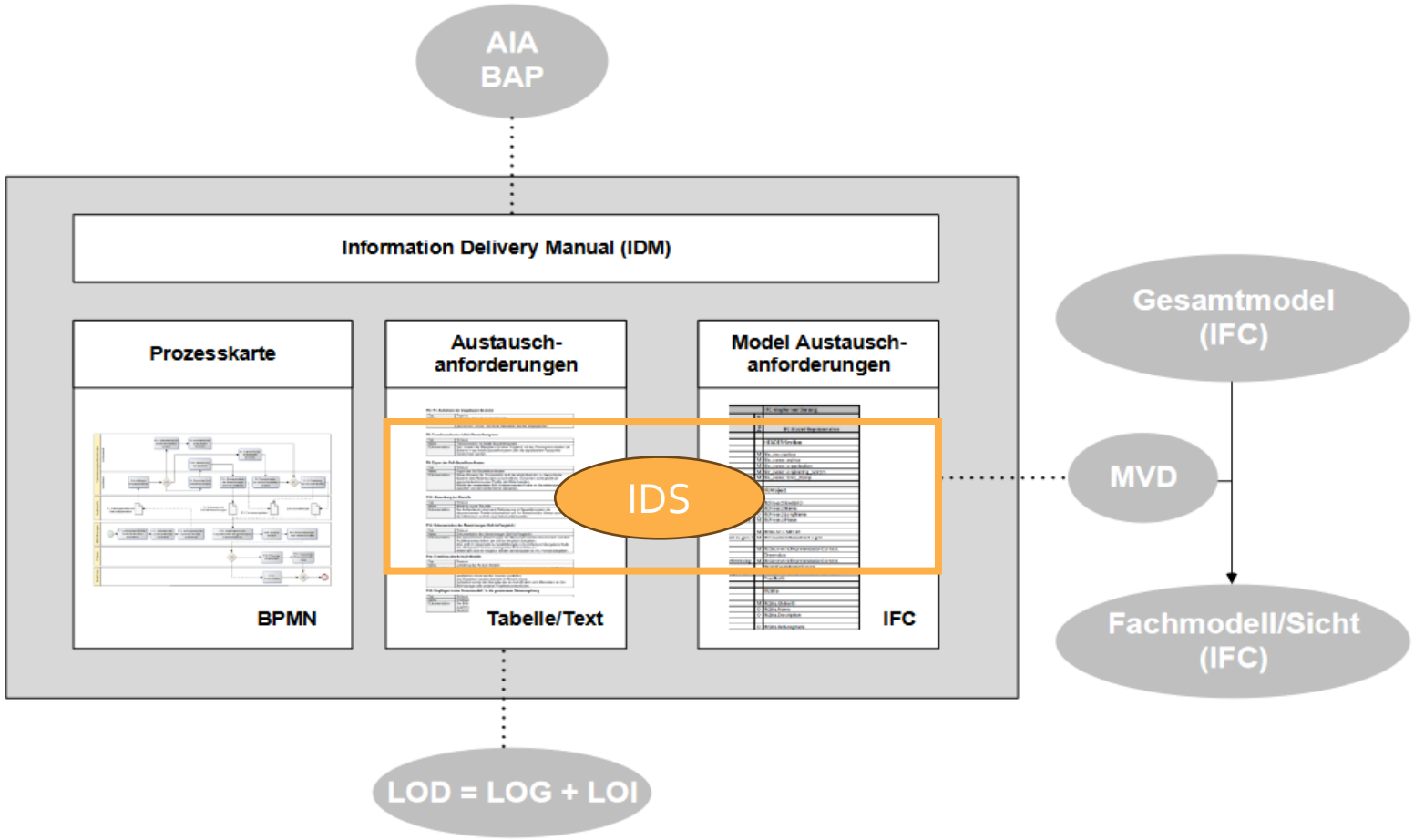
IDS im Kontext

Mit verwandten Standarden.



Görne (2016)

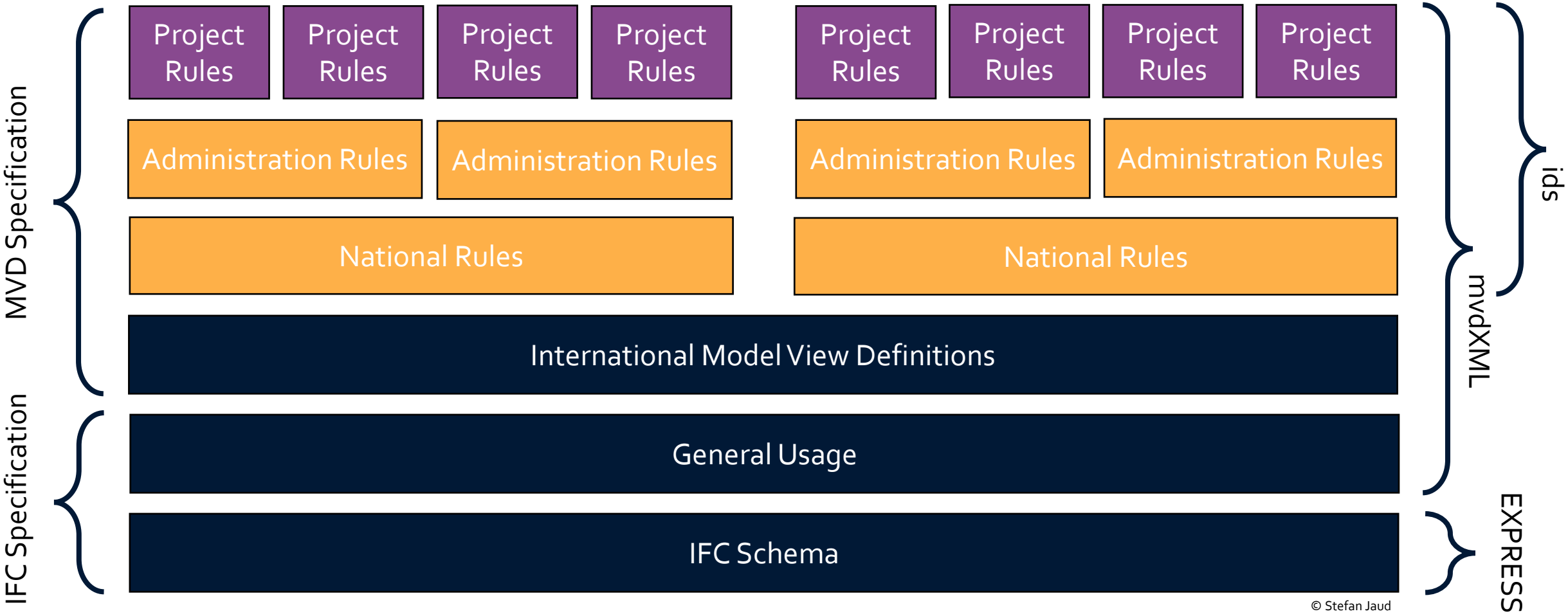
Vergleich: Anforderungsspezifikation

○ – No
◑ – Partial
● – Yes
* – under development

	Standardised	Applicability	Fields					Value constraints				Content			Geom.		Metadata		
			Info. type	Data type	Unit of meas.	Description	References	Equality	Range	Enumeration	Patterns	Existence	Documents	Structure	Representation	Detailedness	Purpose	Actors	Process map
Spreadsheet	○	◑	◑	◑	◑	◑	◑	◑	○	○	○	○	○	○	○	○	◑	○	○
PDT*	●	◑	◑	●	●	◑	●	○	◑	●	○	◑	○	○	○	○	◑	○	○
Data Dict.	●	○	●	●	◑	●	●	●	◑	●	◑	○	○	○	○	○	○	○	○
IDS*	●	●	●	●	●	◑	◑	●	●	●	●	●	○	◑	○	○	●	◑	○
mvdXML	●	●	●	●	●	◑	○	●	●	◑	◑	◑	○	●	●	○	○	◑	○
idmXML	●	◑	◑	◑	◑	●							●		◑	◑	●	●	●
LOIN*	●	◑	◑	●	●	◑	◑	○	○	●	○	○	●	◑	◑	●	●	●	○
IFC P.T.	●	◑	◑	●	●	◑	○	○	○	●	○	○	○	○	○	○	○	○	○
LD+SHACL	○	●	●	●	●	◑	●	●	●	●	●	◑	◑	●	●	○	◑	◑	○

Tomczak et al. (2022)

Anwendungsbereich



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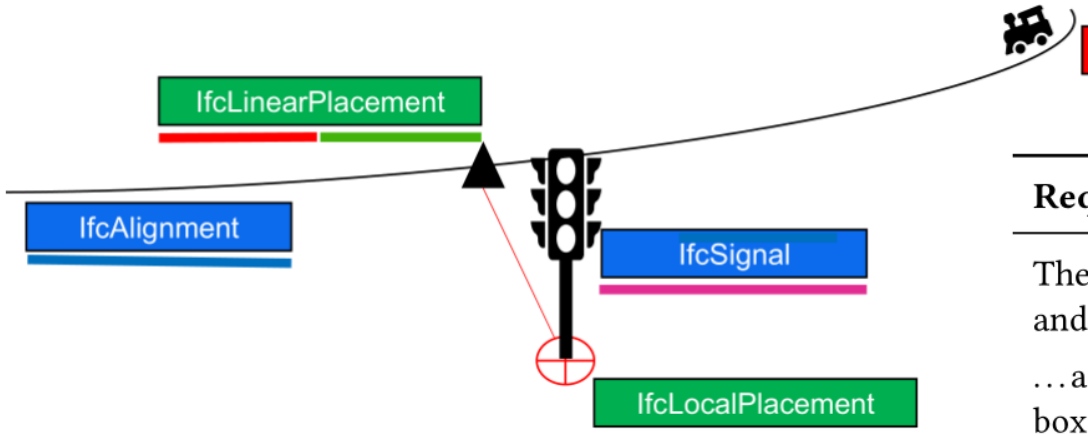


Beispiel

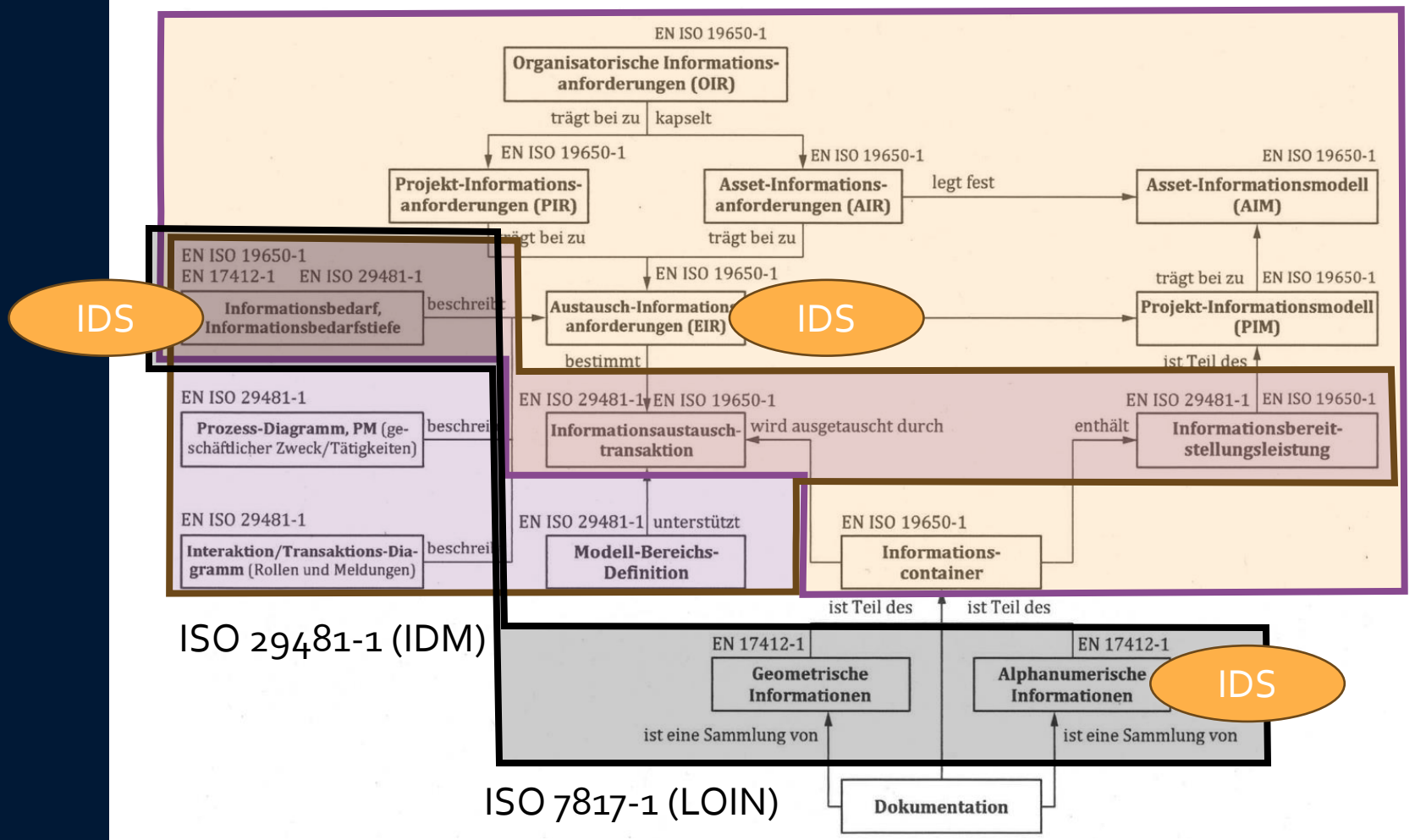
Entlang der Achse „0001R" steht ein Signal „Signal 01" bei Position 69.395 m.

Requirement	IDS	mvdXML
There shall be an IfcAlignment with name *0001R* and	entity, attribute	Object User Identity
…a signal IfcSignal with name *Signal 01* (cf. blue boxes on Figure 2).	entity, attribute	Object User Identity
The alignment has an IfcGradientCurve as a geometric representation assigned (cf. red box on Figure 2).	✗	Product Representation
There is a station IfcReferent.STATION	entity	Object Predefined Type
…which is linearly placed along the alignment's geometry at 69.395 m using IfcLinearPlacement (cf. green box on Figure 2).	✗	Product Linear Placement
The station is connected with the alignment using IfcRelPositions relationship.	✗	Product Relative Positioning
The signal is placed relatively to the station using IfcLocalPlacement (cf. green box on Figure 2)	✗	Product Relative Placement
…and connected to it with IfcRelPositions relationship.	✗	Product Relative Positioning

Fazit

Jack of all trades,
but master of none.

ISO 19650-1 (BIM)



ISO 29481-1 (IDM)

ISO 7817-1 (LOIN)

SN EN 17412-1:2020

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