



EUROPEAN UNION
European Regional
Development Fund



buildingSMART process – IDM (Information Delivery Manual)

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Technical University
of Denmark



Danish Building Research Institute
AALBORG UNIVERSITY



LUND UNIVERSITY



buildingSMART®
International home of openBIM

Information Delivery Manuals

- **Information Delivery Manuals (IDM)**
 - Aimed at exchange of computer interpretable information
 - General method but details are buildingSMART specific
 - An IDM defines
 - WHO is requesting information
 - WHY in relation to a process or decision
 - WHEN stage in a project
 - WHAT information to be exchanged
 - WHOM is receiving the information

What is IDM about?

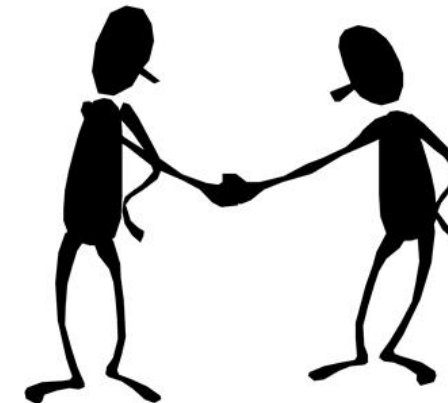
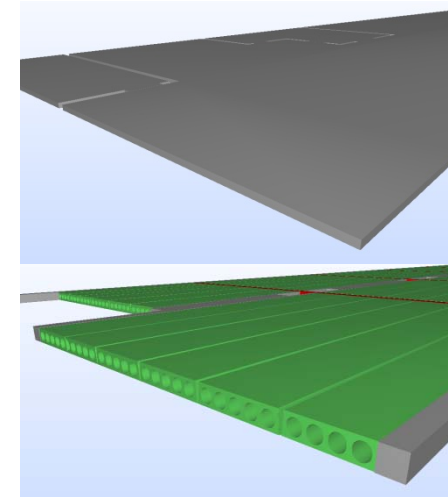
- **AEC/FM industry**
 - **Clients**
 - **Architects**
 - **Consulting Engineering Companies**
 - **Contractors**
 - **Supplies**
 - **Operators**
 - **Facility Managers**
- **All actors are depending on information from each other in order to do their job**



IDM specifies which information that have to be delivered from one party to another at a given point in time

What is the purpose of IDM?

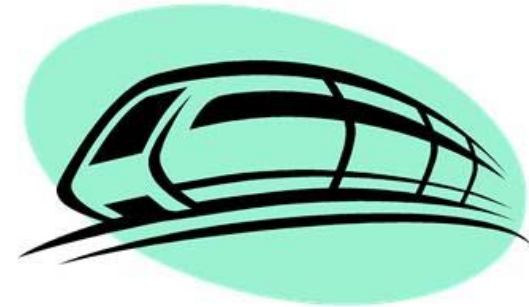
- **In order to have a successful communication process**
 - The sending part must know which, when and how information have to be delivered
 - The receiving part must know what to receive at a given time
 - This requires mutual agreements on when the information is available, how it can be used and the expected level of detail



What is the purpose of IDM?

- In order to have a successful **digital** communication process
 - Every detail have to be specified
 - Computers are intolerant when it comes to information
 - Humans are better to interpret data than computers
 - Most computer programs need very well organized data
 - Computers are like a train – faster than walking but it will only follow the track!
 - We may in the future have self organizing software systems like artificial robots, but until than we have to “create” and “follow” the tracks

Computer based interpretation of data requires use of well defined data structures



Will IDM limit creativity?

- **Representation and presentation**

- Analogy: In order for one telephone to call another phone it always have to dial a number
- The software interface may hide the representation and present the information in a different way
 - You may use
 - Number
 - Telephone number
 - Name
 - Picture
 - Voice
- Most people can't remember telephone numbers anymore

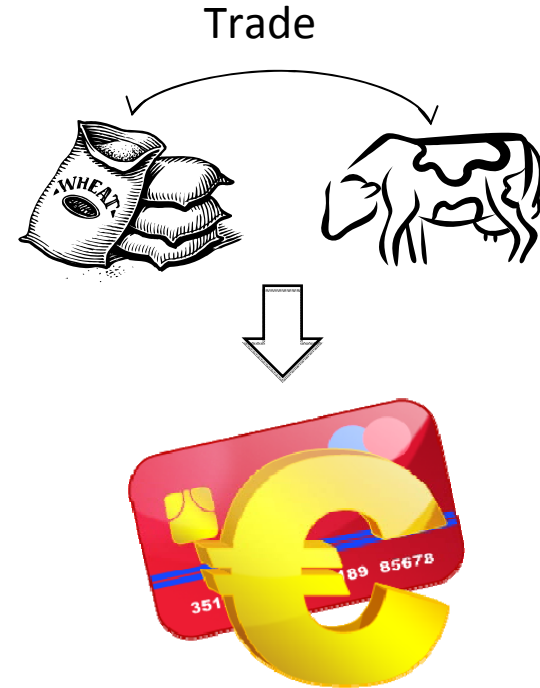


IDM will not automatically reduce creativity or limit working procedures

Challenges

- **Lack of well-defined**
 - Processes
 - Data
 - Business rules
 - Classification
 - Measurement
 - Level of detailin the construction industry
- **More time is consumed on agreeing on processes than documenting them**
- **IDM needs support from **software** in order to be useful** (MVD, implementation)

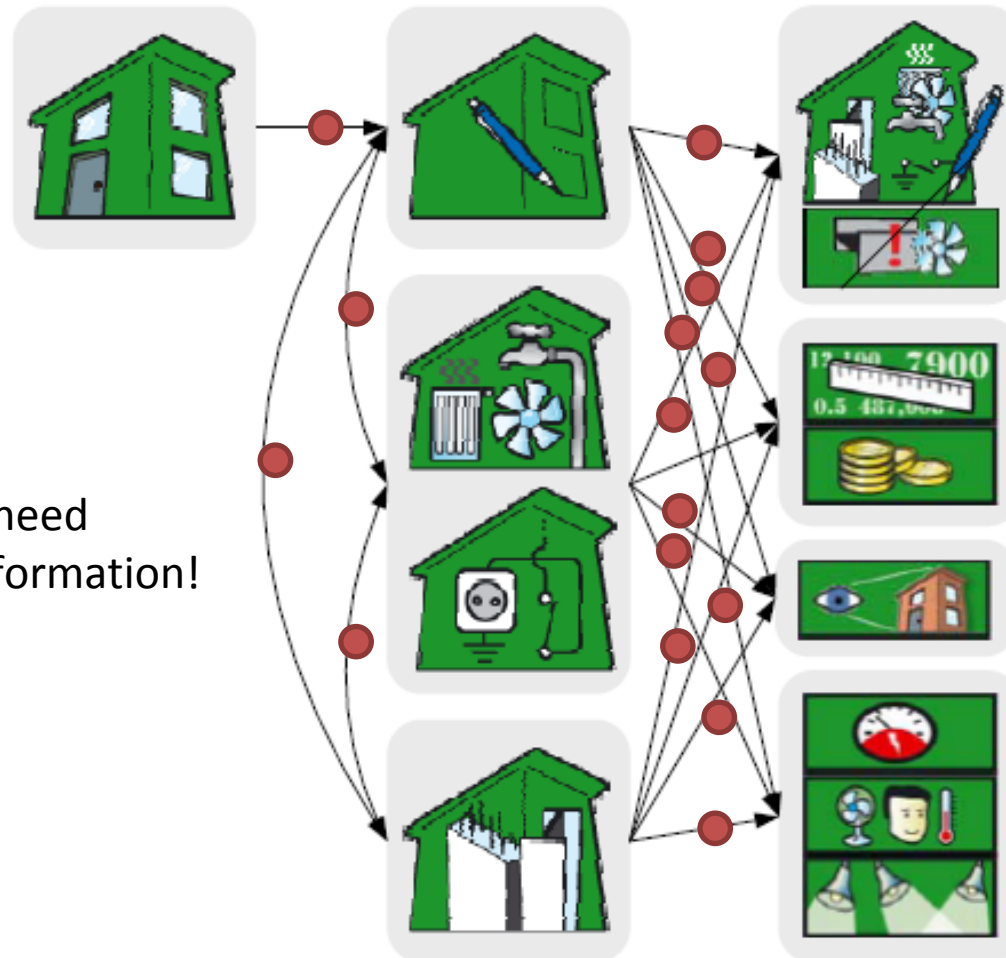
Concentrate first on repeatable processes



I need different information at different stages!

Yes, actors need different information!

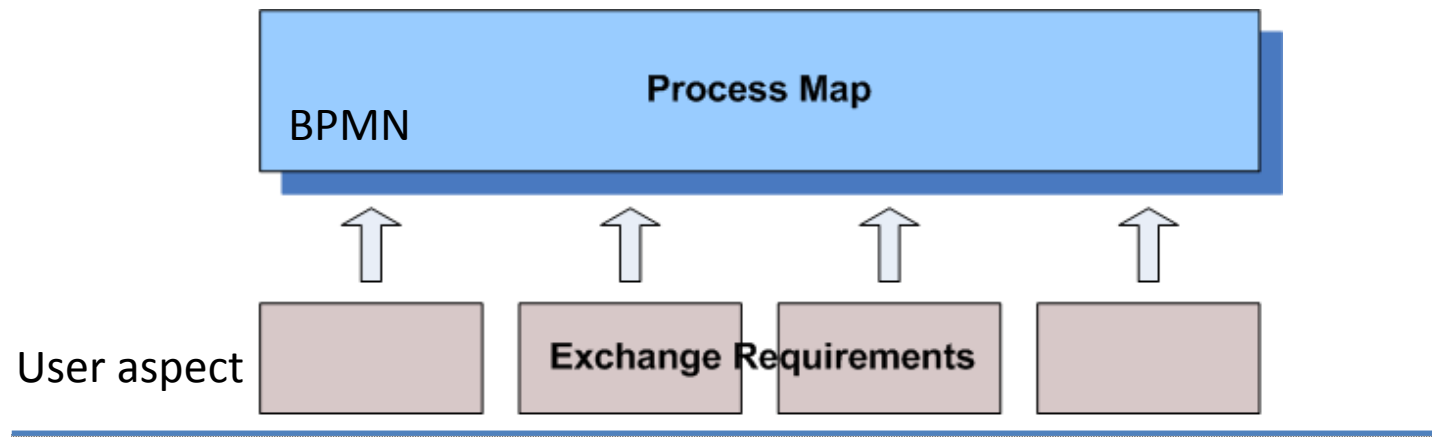
● IDM



Icons: Senate Properties, BIM Requirements 2007

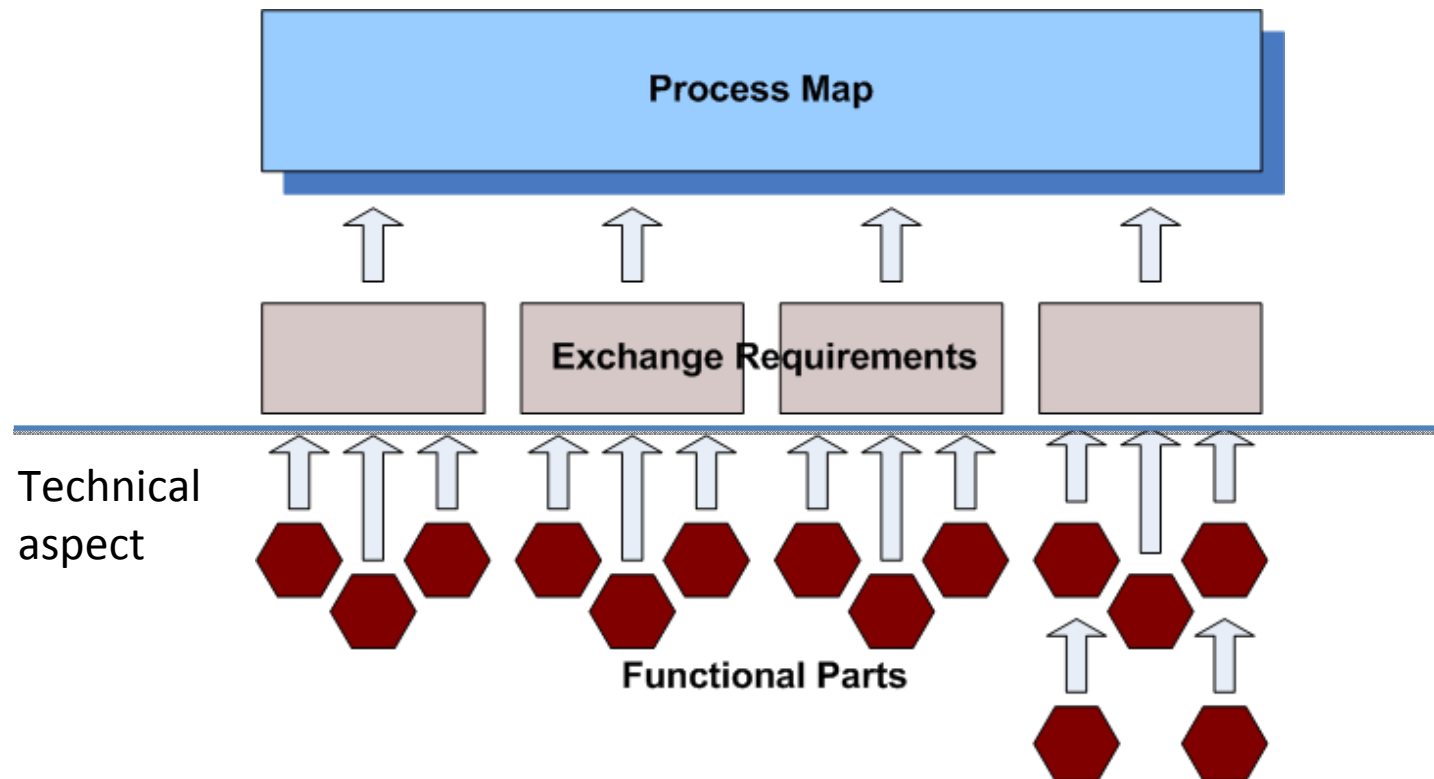
Components in an IDM

- IDM consists of



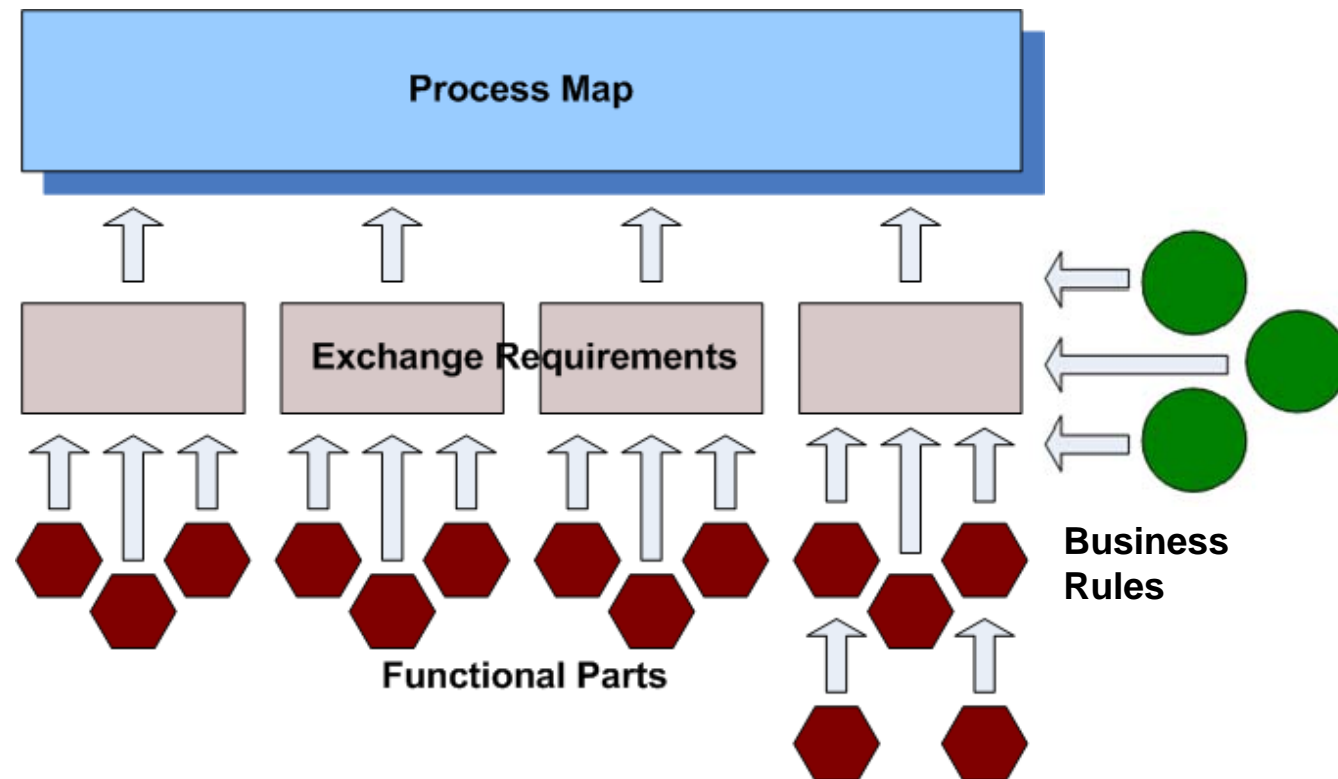
Components in an IDM

- IDM consists of



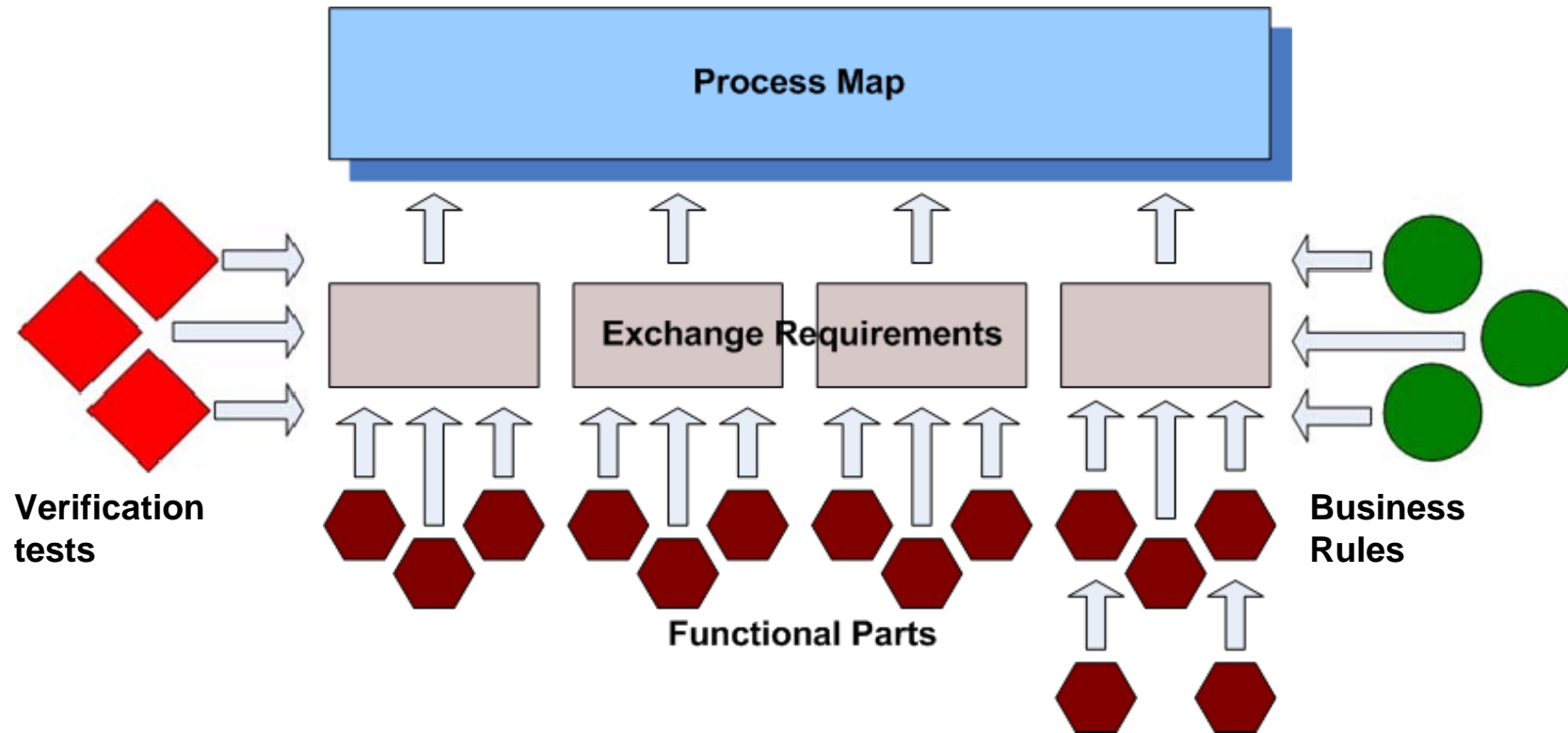
Components in an IDM

- IDM consists of



Components in an IDM

- IDM consists of





bSa, NBIMS Document #:

Date

Insert < Working Group Name>

Insert <IDM Use Case Name>

Version

Concept Design BIM 2010

Process Map

Name **Spatial Program Validation**

Change Log		
15-May-08	Version 0.5 created, based on GSA BIM Series 02 documents developed in 2006.	RichSee@DigitalAlchemyPro.com
01-Jun-08	Version 0.7 – adding task descriptions and updates to the process diagram	RichSee@DigitalAlchemyPro.com
26-Jun-08	Version 0.9 – finalizing the process, task descriptions, data objects, exchange definitions, and coordination point definitions	RichSee@DigitalAlchemyPro.com
25-Aug-08	Version 0.92 - Updates to address comments from Peggy Ho (GSA) and Anne Aaltonen (Solibri)	RichSee@DigitalAlchemyPro.com
06-Nov-08	Version 0.95 – Updated process diagram to address comments from Solibri.	RichSee@DigitalAlchemyPro.com
30-Nov-08	Version 0.96 – Updates to address comments/requests from Statsbygg and Senate.	RichSee@DigitalAlchemyPro.com
15-May-09	Version 1.00 – updates to address comments/requests from Statsbygg/Senate.	RichSee@DigitalAlchemyPro.com
25-Jul-09	Version 1.10 – updates to address comments/requests to generalize the verbiage to work for any building owner.	RichSee@DigitalAlchemyPro.com
19-Aug-09	Version 1.2 – more updates to address comments/requests to generalize the verbiage to work for any building owner.	RichSee@DigitalAlchemyPro.com
Exchange Requirements	ER_Spatial_Program_Validation_(concept)	

Contents

OVERVIEW	2
SPECIFICATION OF PROCESS	4
CONCEPT DESIGN PHASE SPATIAL PROGRAM VALIDATION	4
[1.1] Develop the Concept Design BIM	4
[1.2] Address BIM Guide Requirements	4
[1.3] Check BIM Against BIM Guide Requirements	4
[1.4] Submit Concept Design BIM	5
[1.5] Initiate Design Validation	5
[1.6] Pre-Check BIM	5
[1.7] Report Pre-Checking Results	5
[1.8] Review and Comment Pre-Check Results	5

– Requirements Definition - Information Delivery Manual (IDM) –
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IDM: DK GOV Spaces

IDM ID: DK-GOV-Area



IDM Header: Arealinformation fra projekt til FM

Document Id	Title	Organisation /Author	Date	Status
DK-GOV-Area	Arealinformation fra projekt til FM	buildingSMART-DK	20100816	App

Udarbejdet efter international standard ISO/IEC 29481-1 Information Delivery Manual (IDM)

Vejledning for aflevering af digital arealinformation

Denne vejledning beskriver formål, procedure og specifikation for aflevering af digitale arealdata via en bygningsinformationsmodel (BIM) i IFC-format.

Formål

I forbindelse med arealforvaltning i de statslige styrelser er det af stor værdi at have overblik over alle bygningernes arealer. Arealer er selve formålet med bygningerne og er styrende i en lang række af forvaltningsprocesserne. Arealer danner således grundlag for konkurrencer, husleje, rengøring, energivurdering, indberetninger, benchmarking og lignende.

Derfor er det af vital betydning, at arealinformation efter nybygning, renovering og ombygning hurtigt bliver registreret korrekt i centrale systemer hos driftsherren. Derfor stilles der med denne vejledning konkrete krav om aflevering/udveksling af arealinformation i de relevante processer.

Specifikationen vil blive benyttet af de statslige bygherrer i Danmark.

Det er udelukkende rum og den rumlige struktur i bygningen, der stilles krav til og som skal afleveres.

Læsevejledning

Afsnittene Formål, Leveranceoversigt og Procesoversigt er rettede mod projektledere og beslutningstagere.

Øvrige afsnit omhandler specifikationer for dataleverancen, og er derfor rettede mod teknikere.

Udarbejdet af buildingSMART Danmark på initiativ af Slots- og Ejendomsstyrelsen



Finansministeriet
Slots- og
Ejendomsstyrelsen



Universitets- og
Bygningsstyrelsen



Side	Author
1 af 9	buildingSMART DK - Jan Karlshøj, Stig Brinch

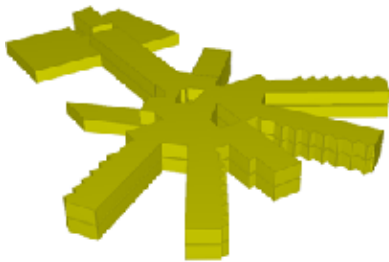
Experiences by Dalux

4 Projekter med stigende BIM krav

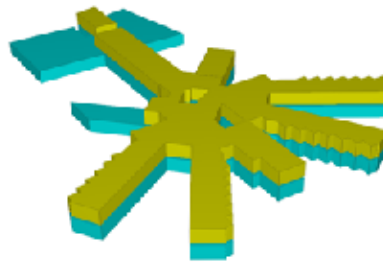
Projekt	BIM Check før aflevering	IFC Arealer	IFC Energi Økonomi	Resultat
Niels Bohr	Nej	Ja	Nej	Visuelt brugbart
Panum	Tilbud	Ja	Nej	Anvendeligt
KU Life	Krav	Ja	Nej	Super
Campus Ballerup	Krav	Ja	Ja	?



Nyt fængsel Falster Første erfaringer



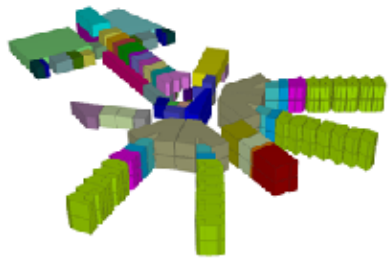
BRUTTO AREALER



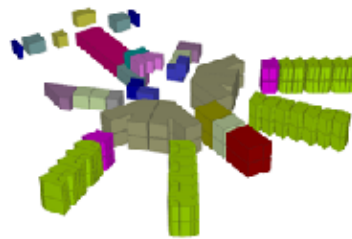
BRUTTO / ETAGE



NETTO / ETAGE



RUM EFTER TYPE (NÆRHED)



RUM, FILTERET EFTER ANVENDELSE



RUM, PERSONALERELATERET

IDM Roadmap: Services, Lifecycle stages and IDM

Services	ISO 22263 Stages					
		IDM	IDM			
				IDM	IDM	
	IDM					IDM

IDM Roadmap: Identified IDM per stage per service

Services	ISO 22263: Pre-lifecycle stages			
	Inception	Brief		
	Portfolio requirements	Conception of need	Outline feasibility	Substantive feasibility
Client's needs		Design brief to design		
			Compare proposal with brief	
				Client's evaluation
Regulatory			Do code compliance checking	
Modelling		Existing conditions building/ environment to design		
			Make Archi. BIM model	
			Make Elect. BIM model	
			Make HVAC. BIM model	
			Make Struc. BIM model	
			Make Georeferencing	

IDM Roadmap: Identified IDM per stage per service

Services	ISO 22263: Pre-lifecycle stages			
	Inception	Brief		
	Portfolio requirements	Conception of need	Outline feasibility	Substantive feasibility
Performance Analysis			Perform energy analysis	
			Perform HVAC control analysis	
			Perform Structural analysis	
			Perform Elec analysis	
			Perform Daylight analysis	
			Perform Egress analysis	
			Perform LCC analysis	
				Perform security analysis
Cost			Make quantity take-off	
			Perform cost analysis	
Coordination			Perform consistency control	
Presentation			Visualize Solution	

IDM Roadmap: Identified IDM per stage per service

Services	ISO 22263: Pre-construction stages		
	Design		
	Outline conceptual design	Full conceptual design	Coordinated design (and procurement)
Client's needs	Compare proposal with brief	Compare proposal with brief	Compare proposal with brief
			Client's evaluation
Regulatory	Do code compliance checking	Do code compliance checking	
Modelling	Make Archi. BIM model	Make Archi. BIM model	Make Archi. BIM model
	Make Elect. BIM model	Make Elect. BIM model	Make Elect. BIM model
	Make HVAC. BIM model	Make HVAC. BIM model	Make HVAC. BIM model
	Make Struc. BIM model	Make Struc. BIM model	Make Struc. BIM model
Performance Analysis	Perform energy analysis	Perform energy analysis	
	Perform HVAC control analysis	Perform HVAC control analysis	
	Perform Structural analysis	Perform Structural analysis	
	Perform Elec analysis	Perform Elec analysis	
	Perform Accessibility analysis	Perform Accessibility analysis	
	Perform Acoustic Simulation	Perform Acoustic Simulation	
	Perform Daylight analysis	Perform Daylight analysis	

IDM Roadmap: Identified IDM per stage per service

Services	ISO 22263: Pre-construction stages		
	Design		
	Outline conceptual design	Full conceptual design	Coordinated design (and procurement)
Performance Analysis cont.	Perform Egress analysis	Perform Egress analysis	
	Perform LCC analysis	Perform LCC analysis	
	Enhance element with Fire requirements		
	Perform security analysis	Perform security analysis	
Cost	Make quantity take-off	Make quantity take-off	Make quantity take-off
	Perform cost analysis	Perform cost analysis	Perform cost analysis
Documentation			BIM handover to contractor
			Make FM documentation
Coordination	Perform Consistency control	Perform Consistency control	Perform Consistency control
Presentation	Visualize Solution	Visualize Solution	Visualize Solution

IDM Roadmap: Identified IDM per stage per service

Services	ISO 22263: Construction stages	
	Production	
	Production Information	Construction
Client's needs	Compare proposal with brief	Compare proposal with brief
Regulatory		Start commissioning
Cost	Make quantity take-off	
	Perform cost analysis	Perform cost analysis
Construction	Find construction products	
	Sim.construction sequencing	
	Perform procurement	
	Perpare safty on site	
		Control machinery
		Handle construction logistics
Documentation	BIM handover to subcontractor	
	Make production doc.	
		Make FM documentation
Coordination	Perform consistency control	
Presentation	Visualize Solution	Visualize Solution

IDM Roadmap: Identified IDM per stage per service

Services	ISO 22263: Post Construction stages	
	Maintenance	Demolition
	Operation and maintenance	Disposal
Performance Analysis	Perform energy optimization	
	Monitor building	
Regulatory		Recycle material
		Prepare demolition of building
Operation	Manage spaces	
	Schedule maintenance	
Documentation	Make FM documentation	
	Make FM docu. from non BIM	
	Create opera. doc. from BIM	

IDM Roadmap: Prioritised Information Delivery Manual (IDM)

Primary

Secondary

Services	ISO 22263: Pre-lifecycle stages			
	Inception	Brief		
	Portfolio requirements	Conception of need	Outline feasibility	Substantive feasibility
Performance Analysis			Perform energy analysis	
			Perform HVAC control analysis	
			Perform Structural analysis	
			Perform Elec analysis	
			Perform Daylight analysis	
			Perform Egress analysis	
			Perform LCC analysis	
				Perform security analysis
Cost			Make quantity take-off	
			Perform cost analysis	
Coordination			Perform consistency control	
Presentation			Visualize Solution	

IDM Roadmap: Prioritised Information Delivery Manual (IDM)

Primary

Secondary

Services	ISO 22263: Pre-construction stages		
	Design		
	Outline conceptual design	Full conceptual design	Coordinated design (and procurement)
Client's needs	Compare proposal with brief	Compare proposal with brief	Compare proposal with brief
			Client's evaluation
Regulatory	Do code compliance checking	Do code compliance checking	
Modelling	Make Archi. BIM model	Make Archi. BIM model	Make Archi. BIM model
	Make Elect. BIM model	Make Elect. BIM model	Make Elect. BIM model
	Make HVAC. BIM model	Make HVAC. BIM model	Make HVAC. BIM model
	Make Struc. BIM model	Make Struc. BIM model	Make Struc. BIM model
Performance Analysis	Perform energy analysis	Perform energy analysis	
	Perform HVAC control analysis	Perform HVAC control analysis	
	Perform Structural analysis	Perform Structural analysis	
	Perform Elec analysis	Perform Elec analysis	
	Perform Accessibility analysis	Perform Accessibility analysis	
	Perform Acoustic Simulation	Perform Acoustic Simulation	
	Perform Daylight analysis	Perform Daylight analysis	

IDM Roadmap: Prioritised Information Delivery Manual (IDM)

Primary

Secondary

Services	ISO 22263: Pre-construction stages		
	Design		
	Outline conceptual design	Full conceptual design	Coordinated design (and procurement)
Performance Analysis cont.	Perform Egress analysis	Perform Egress analysis	
	Perform LCC analysis	Perform LCC analysis	
	Enhance element with Fire requirements		
	Perform security analysis	Perform security analysis	
Cost	Make quantity take-off	Make quantity take-off	Make quantity take-off
	Perform cost analysis	Perform cost analysis	Perform cost analysis
Documentation			BIM handover to contractor
			Make FM documentation
Coordination	Perform Consistency control	Perform Consistency control	Perform Consistency control
Presentation	Visualize Solution	Visualize Solution	Visualize Solution

IDM Roadmap: Prioritised Information Delivery Manual (IDM)

Primary

Secondary

Services	ISO 22263: Construction stages	
	Production	
	Production Information	Construction
Client's needs	Compare proposal with brief	Compare proposal with brief
Regulatory		Start commissioning
Cost	Make quantity take-off	
	Perform cost analysis	Perform cost analysis
Construction	Find construction products	
	Sim.construction sequencing	
	Perform procurement	
	Perpare safty on site	
		Control machinery
		Handle construction logistics
Documentation	BIM handover to subcontractor	
	Make production doc.	
		Make FM documentation
Coordination	Perform consistency control	
Presentation	Visualize Solution	Visualize Solution

IDM Roadmap: Content table for Primary prioritised Information Delivery Manual (IDM)


IDM	Stage	Service
Perform energy analysis	Outline feasibility	Performance Analysis
Make Archi. BIM model	Outline conceptual design Full conceptual design Coordinated design(and procurement)	Modeling
Make Elect. BIM model	Outline conceptual design Full conceptual design Coordinated design(and procurement)	Modeling
Make HVAC. BIM model	Outline conceptual design Full conceptual design Coordinated design(and procurement)	Modeling
Make Struc. BIM model	Outline conceptual design Full conceptual design Coordinated design(and procurement)	Modeling
Make quantity take-off	Coordinated design(and procurement)	Costing
Perform cost analysis	Coordinated design(and procurement)	Costing
Make FM documentation	Coordinated design(and procurement)	Documentation
Perform consistency control	Coordinated design(and procurement)	Coordination

IDM Roadmap: Content table for Secondary prioritised Information Delivery Manual (IDM)

IDM	Stage	Service
Design brief to design	Conception of need	Client's needs
Perform LCC analysis	Outline feasibility	Performance Analysis
Do code compliance checking	Full conceptual design	Regulatory
Perform procurement	Production Information	Construction
Make FM documentation	Construction	Documentation

IDM Roadmap: Invitation letter

- A single page document have been produced to encourage organizations to take active part in or sponsor the development of top prioritised Information Delivery Manuals.



Document id	Title	Organisation /Author	Date	Status
IDMC_014	Prioritised IDMs	IDMC	22/02/11	Ver. 1.1

Call for Active Participation in making Data Exchange SMARTER
The Construction and Facility Management industries can optimize their processes, improve their efficiency and profit by the use of digital communication. Optimization is also an important aspect in creating more sustainable solutions. BuildingSMART is an international non-profit organization that enables digital communication by the use of open standards.

BuildingSMART is focusing on standardisation of computer interpretable exchange of data in order to reduce the need for manual retyping in numerous IT-tools. In practice, the data which should be exchanged between parties, must be specified and structured and have support from software programs. BuildingSMART has developed a methodology for specifying business processes and exchange requirements and how they can be transformed into more technical specifications that again can be used for software implementation and eventually a certification process.

The process is initiated with the development of a specification, named an Information Delivery Manual (IDM) that specifies the exchange requirements in a specific business process.

The International User Group, which is a subgroup within buildingSMART, has identified a number of prioritized Information Delivery Manuals that should be developed in accordance with an overall IDM Roadmap. The prioritized IDMs are characterized by their support of exchange scenarios that frequently occur and aim at both easing the job for the involved parties as well as increasing the quality of the end product.

BuildingSMART is looking for organizations and sponsors that want to get involved in the development of the prioritized IDMs. By their participation they will be able to influence the outcome, include their company, national or regional requirements into the process in order to make the final result applicable for their own needs.

The list of prioritized Information Delivery Manuals is:

- Performing Energy analysis in Outline feasibility Stage
- Creation of Architectural, Structural, Electrical and HVAC BIM models in the Design phases
- Perform Quantity Take-off and Cost analysis during Coordinated Design and Procurement Stage
- Develop FM documentation during Coordinated Design and Procurement Stage
- Perform Consistency Control during Coordinated Design and Procurement Stage

If you wish to get involved or are looking for more information please contact one of the following persons:

- International IDM Coordinator: Jan Karlshøj, jan.karlshoj@gravicon.dk
- Your local buildingSMART Chapter contact

Procedure for approval of IDMs

Stage 1: Initiating development of Information Delivery Manuals

- This stage can be compared to ISO stage 1: Proposal Stage in developing of ISO standards.

Stage 2: Developing Information Delivery Manuals

- This stage can be compared to ISO stage 2: Preparatory stage in development of ISO standards.

Stage 3: Seeking official status as a buildingSMART Information Delivery Manual

- This stage can be compared to ISO stage 3: Committee stage in development of ISO standards.

Stage 4: Preparation to becoming an official buildingSMART Information Delivery Manual

- This stage can be compared to ISO stage 4: Enquiry stage in development of ISO standards.

Stage 5: Approval as an official buildingSMART Information Delivery Manual

- This stage can be compared to ISO stage 5: Approval stage in development of ISO standards.

Stage 6: Publishing official buildingSMART Information Delivery Manual

Information

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