

# EDUCATIONAL SYSTEM - buildingSMART NORWAY

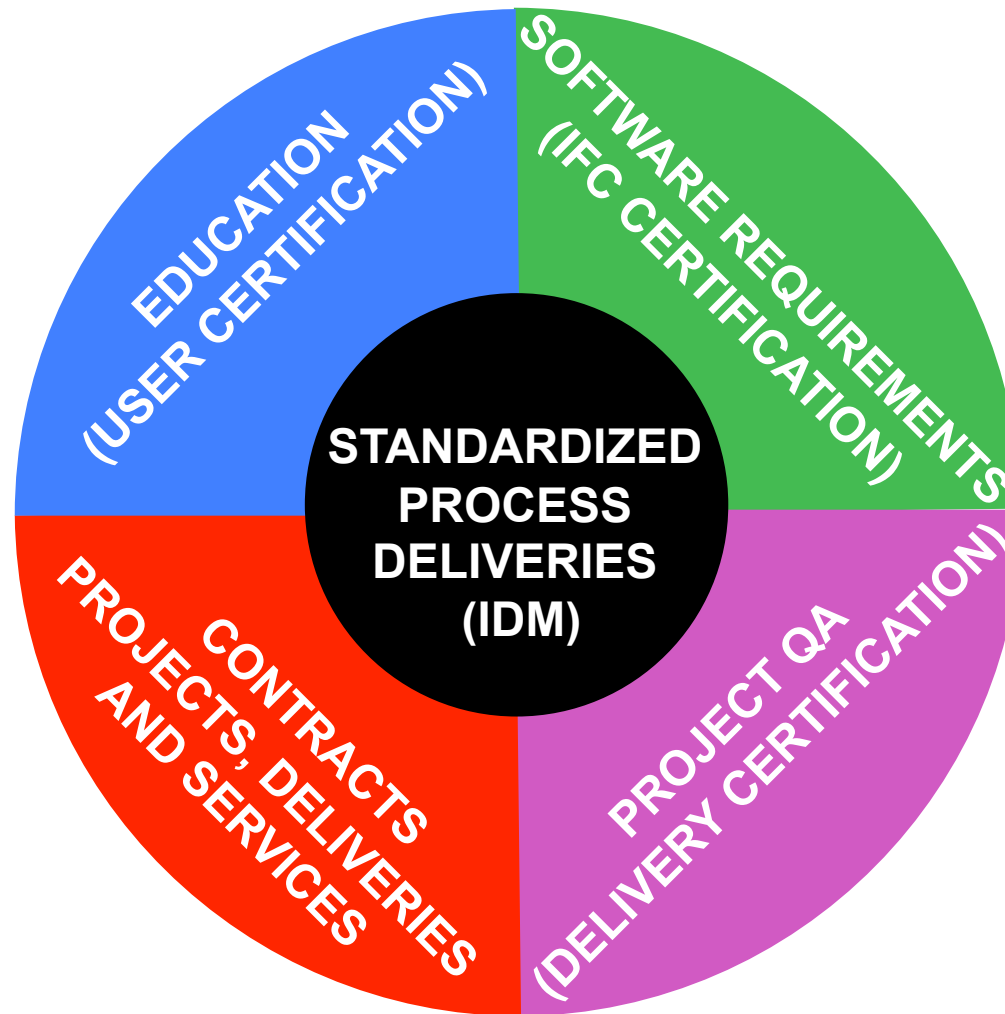
PROCESS ROOM – TOKYO – 16.10.2012 – STEEN SUNESEN

## NATIONAL openBIM REQUIRES EDUCATION

1. openBIM is a project requirement in more and more Norwegian projects.
2. Move from pilot projects to broad national use.
3. Establish a low-threshold information/requirement system

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## IDM BASED EDUCATION - 2012

IDM = Agree on Best-Practice on general processes

1. Clash-detection
2. Visualization
3. Cost Estimation
4. 4D - Planning and Ressource Allocation

Free to use <http://www.buildingsmart.no/standarder/buildingsmart-prosess>

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åpenBIM datautvekslingskrav - ER bSNP forenklet spesifikasjon	Visualisering			Kollisjons- kontroll	Kalkyle			Fremdrift & Ressurs- styring			
	bSNP2			bSNP3	bSNP4			bSNP5			M = mandatory O = optional X = skal ikke være med
Beskrivelse	ER 2.1	ER 2.2	ER 2.3	ER 3.1	ER 4.1	ER 4.2	ER 4.3	ER 5.1	Kobling til IFC 2x3	Kobling til IFC 4	Kommentar
<b>Krav til modell</b>											
Felles origo i prosjekt	M	M	M	M	M	M	M	M	Geometri	Geometri	
Hensikt med datautveksling	M	M	M	M	M	M	M	M	-	-	
Modellens status	M	M	M	M	M	M	M	M	Defineres av NS8360	Defineres av NS8360	
<b>Krav til innhold av modell</b>											
Alle konstruksjonselementer	X	X	M	M	M	M	M		Geometri	Geometri	
Synlige objekter	M	M							Geometri	Geometri	
Eksterne objekter	X	M							Geometri	Geometri	
Korrekt objekt-geometri				M					Geometri	Geometri	
Objekter i produksjonsmessige størrelser								M	Geometri	Geometri	
Løst inventar	M	X	X	X	X	X	X		Geometri	Geometri	
<b>Krav til alle objekter i modell</b>											
Unik ID (GUID)	M	M	M	M	M	M	M	M	IfcRoot_GUID	IfcRoot_GUID	
Programnavn	M	M	M	M	M	M	M	O	IfcRoot_Description	IfcRoot_Description	
Prosjektnavn	O	O	O	O	O	O	O	O	IfcElement_Tag	IfcElement_Tag	
Typenavn	M	M	M	M	M	M	M	M	IfcObject_ObjectType	IfcObject_ObjectType	
Etasjetilhørighet	O	O	O	O	O	O	O	M	IfcStorey	IfcStorey	
Objekt status				M	O	O	O	M	Defineres av NS8360	Defineres av NS8360	
Entreprisetilhørighet					M	M	M	M	Defineres av NS8360	Defineres av NS8360	
<b>Krav til bygg (ARK og RIB) elementer</b>											
Intern / Eksternt objekt							M	M	IsExternal	IsExternal	
Materialkrav								O	IfcMaterialLayer	IfcMaterialDefinition	
Materialkrav, prosjektert								M	IfcMaterialLayer	IfcMaterialDefinition	
Materialkrav, oppfylt								M	-	-	
Brannkrav								O	IfcFiringRating	IfcFiringRating	
Brannkrav, prosjektert								M	IfcFiringRating	IfcFiringRating	
Brannkrav, oppfylt								M	Defineres av NS8360	Defineres av NS8360	
Lydkrav								O	IfcAcousticRating	IfcAcousticRating	
Lydkrav, prosjektert								M	IfcAcousticRating	IfcAcousticRating	
Lydkrav, oppfylt								M	Defineres av NS8360	Defineres av NS8360	
Krav U-verdi								O	IfcThermalTransmittance	IfcThermalTransmittance	
Krav til U-verdi, prosjektert								M	IfcThermalTransmittance	IfcThermalTransmittance	
Krav til U-verdi, oppfylt								M	Defineres av NS8360	Defineres av NS8360	

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## IDM BASED EDUCATION - 2013

Next year IDM

1. Accessibility
2. Georeferencing
3. Escavation from openBIM
4. Building Programming - BPie
5. Facility Management - FMie (requirements, not best practice yet)
6. Energy Analysis (NS 3031)

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## CONTENT

### General part

How to think in multi-disciplinary and long-term information perspectives

### Training for specific Business Roles

- |                         |  |
|-------------------------|--|
| 1. Clients              | Requiring services, User of openBIM information,<br>User of openBIM Software |
| 1. Architects/Engineers | Author of openBIM and user of openBIM software                               |
| 2. Contractors          | Recipient of openBIM, User of openBIM software                               |
| 3. Owners               | Recipients of openBIM, user of FM software                                   |

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## CONTENT GENERAL PART

### **Content**

Motivation – Seeing is believing

Context – Why the Industry needs åpenBIM

Understanding potential and obstacles of openBIM

Insight - The buildingSMART idea and standards

Introduction to role specific modules

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## CONTENT ROLE SPECIFIC PART - CLIENT

### Content

- Understand clients responsibility to facilitate multi-domain interoperability and life-cycle perspective in information authoring and use.
- Require multi-domain use of Building Programming, Cost Estimation, Visualization, Clash-detection,
- Use tools for Building Programming, Cost Estimation and Visualization



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## CONTENT ROLE SPECIFIC PART – ARCHITECT/ENGINEER

### Content

- Produce models including information for other roles and/or stages
- Take responsibility for receivers need for information
- Support and use tools for Georeferencing, Clash Detection, Cost Estimation
- Hand-over to contractor

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## CONTENT ROLE SPECIFIC PART - CONTRACTOR

### Content

- Receive openBIM from architect/engineer
- Transform designBIM to constructionBIM (structural design, object dimensions etc.)
- Visualize construction progress and communicate with sub-contractors.
- Use tools for openBIM
  - Building Programming
  - Clash Detection
  - Cost Estimation

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## BUSINESS PLAN

1. Educational program free to use for member organizations

<http://www.buildingsmart.no/buildingsmart-norge/utdanning/utdanning>

2. Offer bS Norway User Certification independently of education – for a fee

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## NATIONAL openBIM HANDBOOK

1. Easy-to-use, low-threshold description on how to specify openBIM Deliveries and to interoperate multi-disciplinary in Design and Construction.
2. Based on the Norwegian Home Builder BIM Manual, Statsbygg BIM Manual, SENRHA openBIM Handbook, NBIMS, COBIM, official IDMs, Relevant Norwegian and International Standards.
3. Digital, database, three-dimensional (time, role, process).

buildingSMART Guide <http://www.buildingsmart.no/bs-guiden>

buildingSMART guiden		Prosjektering				
Kart	Prosjektoppstart	Tidligfase	Detaljfase	Bygging	FDV	
Byggherre/ Prosjektleder	Romprogram	KRAV	KRAV	BYGGE		
PGL	KONSEPT	KONSEPT	KRAV	BYGGE		
Rådgiver	KONSEPT	KONSEPT	KRAV	BYGGE		
Entreprenør	KONSEPT	KONSEPT	KRAV	BYGGE		
Forvalter	KONSEPT				FDV	
Bruker	KONSEPT	KONSEPT	KRAV		FDV	