211in Model Uses Table

v1.25

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I. Introduction

BIM Excellence (BIMe) is a unique *research-based* approach to digital innovation in the construction industry. It provides an integrated methodology and a modular language for performance assessment, learning and process optimisation. The **BIMe Initiative** is *not-for-profit effort* guided by a set of **Principles**[1] undertaken by volunteer researchers from both industry and academia. The BIMe Initiative is supported by in-kind contributions, commercial services, and institutional/corporate sponsorship.

> *This document must be read in conjunction with **101in BIMe Initiative Explainer**, **102in BIMe Initiative Knowledge Structures**, and **103in BIMe Initiative Projects*** (refer to list of publications). *The BIM Excellence approach and the BIMe Initiative are based on the published research of Dr. Bilal Succar and a growing cohort of esteemed international collaborators.*

II. What are Model Uses

Model Uses identify and collate the **Information Requirements** that need to be delivered as – or embedded within – 3D digital models. As a Knowledge Block, Model Uses form part of a larger modular language that connects information requirements with System Units, Defined Roles, and Competency Items[2].

III. Background Research

The conceptual background of Model Uses has been covered in a peer-reviewed conference paper[3] after being more extensively peer-reviewed by eight international subject matter experts (from four countries) through the BIM ThinkSpace[4] blog. A couple of related conceptual foundations were also briefly explained on the BIM Framework blog[5].

[1] BIMe Initiative Principles (BIMe Principles, or Principles for short) includes both General Principles and the Excellence Manifesto.
[2] The relations and applications of Knowledge Blocks will be covered by a future BIMe Initiative document.
[3] Succar, B., Saleeb, N., Sher, W. (2016). *Model Uses: Foundations for a Modular Requirements Clarification Language*, Australasian Universities Building Education (AUBEA2016), Cairns, Australia, July 6-8, 2016. http://bit.ly/BIMPaperA10
[4] Understanding Model Uses (Episode 24- Sep 9, 2015)
[5] Model Uses – Conceptual Structures (Post 37 - Sep 9, 2015) and Model Uses Taxonomy (Post 39 - May 24, 2016)

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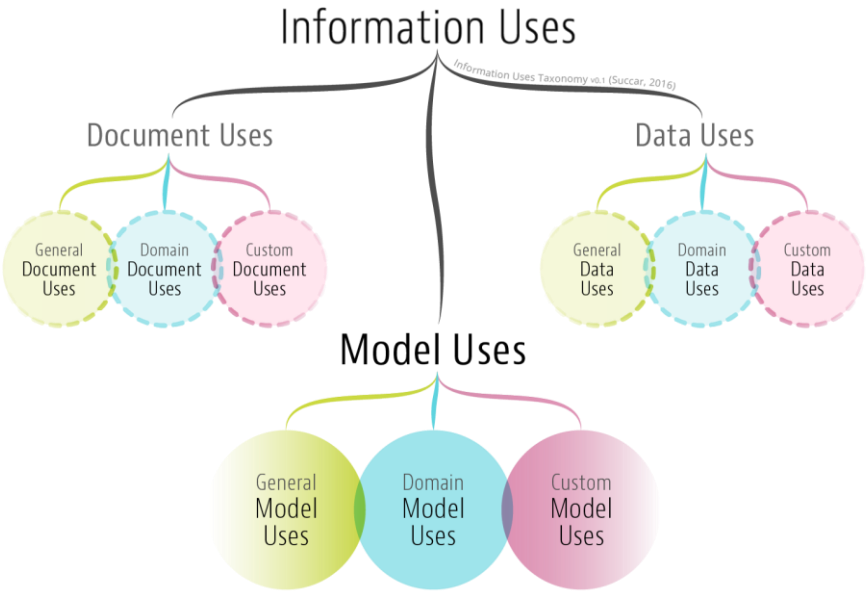
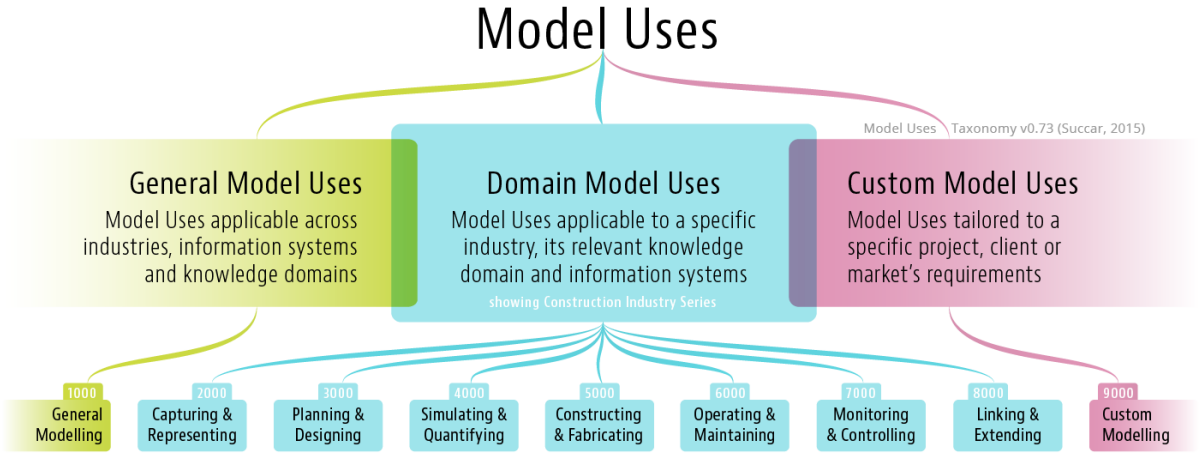
IV. Information Uses

Model Uses are one type of Information Uses which also includes: Document Uses and Data Uses (to be covered in future BIMe Initiative documents).



V. Model Use Categories

Model Uses are grouped into three categories:



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CATEGORY I: Model Uses > General Model Uses

General Model Uses are applicable across industries, information systems and knowledge domains. General MUs include the word 'modelling' in their name and are typically measured using granularity metrics (e.g. Level of Definition , Level of Development and Granularity Level) at component/item level. There are currently 52 General MUs – with 100s of potential synonyms – organized as a single MU Series, General Modelling (1000-1990):

The following is a list of General Model Uses [with a few synonyms]:

CODE	GENERAL MODEL USE	SYNONYMS
1010	Architectural Modelling	Architectural Tectonics
1020	Audio-visual Systems Modelling	Sound Systems Modelling; Video-network Modelling
1030	Barrier Systems Modelling	Fence Modelling; Highway-barrier Modelling
1040	Brick Structures Modelling	Brick Information Modelling
1050	Concrete Structures Modelling	Concrete Frame Modelling
1060	Conservation Modelling	Historical Site Modelling; Historical Excavation Modelling; Ancient Monument Modelling
1070	Decorative Modelling	Wrought Iron Modelling; Gypsum Decorations Modelling; Sculptural Modelling; Fountain Design Modelling
1080	Display Systems Modelling	Exhibition Systems Modelling
1090	Drainage Systems Modelling	Flood-relief systems Modelling
1100	Ducted Systems Modelling	Fresh-air Systems Modelling; Exhaust Systems Modelling; Smoke-extraction Systems Modelling
1110	Extra-terrestrial Structures Modelling	Space-habitat Modelling
1120	Façade Systems Modelling	Glazing Systems Modelling; Cladding Systems Modelling; Curtain Systems Modelling
1130	Fire Systems Modelling	Sprinkler Systems Modelling
1140	Fitout Modelling	Interiors' Modelling; Tenant Modelling
1150	Flue Systems Modelling	Chimney Systems Modelling; Exhaust Systems Modelling
1160	Forensic Modelling	Criminal Investigations Modelling; Crime-scene Modelling
1170	Foundations Modelling	Piling-systems Modelling
1180	Fuel Systems Modelling	Liquefied-gas Supply Systems Modelling; Liquid-fuel Systems Modelling; Gas-supply Systems Modelling
1190	HVAC Systems Modelling	Heating Systems Modelling; Ventilation Systems Modelling; Air-conditioning Systems Modelling;
1200	Hydraulic Systems Modelling	Plumbing Systems Modelling; Compressed-air Systems Modelling; Steam Systems Modelling; Sewage Systems Modelling; Black-water Systems Modelling; Grey-water Systems Modelling

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CODE	GENERAL MODEL USE	SYNONYMS
1210	Information Systems Modelling	Computer Systems Modelling; Communication Systems Modelling; Telecommunication Systems Modelling
1220	Infrastructure Systems Modelling	Underground Systems Modelling; Supply Systems Modelling
1230	Irrigation Systems Modelling	Hydrological Systems Modelling;
1240	Landscape Modelling	Hardscaping; Softscaping
1250	Lighting Systems Modelling	…
1260	Marine Structures Modelling	Oil Riggs Modelling
1270	Masonry Structures Modelling	…
1280	Medical Systems Modelling	Oxygen-pipes Modelling; Vacuum-pipes Modelling
1290	Modular Units Modelling	…
1300	Nuclear Systems Modelling	…
1310	Parametric Modelling	Object-based Modelling; Algorithmic Modelling;
1320	Power Systems Modelling	Generator Systems Modelling; Low-voltage Systems Modelling; Medium-voltage Systems Modelling; High-voltage Systems Modelling; Battery Systems Modelling; Electrical Systems Modelling
1330	Refrigeration Systems Modelling	…
1340	Renovation Modelling	Refurbishment Modelling; Retrofit Modelling
1350	Sanitary Systems Modelling	Septic Systems Modelling
1360	Security Systems Modelling	Surveillance Systems Modelling; Alarm Systems Modelling; Modelling; Listening Systems Modelling
1370	Signage Systems Modelling	Visual-guidance Modelling; Exit Systems Modelling
1380	Signalling Systems Modelling	
1390	Spatial Inspection Modelling	Zone Modelling; Height-inspection Modelling; Clearance-space Modelling; Line-of-sight Modelling;
1400	Steel Frame Modelling	Steel Structures Modelling
1410	Subterranean Spaces Modelling	Tunnel Modelling; Tunnel Shaft Modelling
1420	Temporary Structures Modelling	Scaffolding Systems Modelling; Fence Modelling
1430	Tensile Structures Modelling	Stressed Textile Modelling
1440	Terrain Modelling	Topographical Modelling; Site Modelling; Geological Modelling; Geotechnical Engineering Modelling; Open-pit Modelling
1450	Timber Structures Modelling	Timber Frame Modelling; Truss Systems Modelling
1460	Traffic Modelling	…
1470	Transportation Systems Modelling	Rail Systems Modelling; Road Systems Modelling
1480	Underwater Spaces Modelling	Aquatic Spaces Modelling
1490	Urban Modelling	City Modelling; Precinct Modelling
1500	Vertical Circulation Modelling	Elevator Systems Modelling; Stair Systems Modelling; Escalator Systems Modelling; Vertical Conveyance Modelling
1510	Waste-disposal Systems Modelling	Garbage Systems Modelling
1520	Wood Frame Modelling	Wood Structures Modelling

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CATEGORY II: Model Uses > Domain Model Uses

Domain Model Uses are industry-specific. The ones identified below are *Construction Domain* Model Uses (or BIM Uses for short). The naming format for each Domain Model Use is either a Noun + Adjective (or just an Adjective). There are currently 76 Domain MUs, organized in seven MU Series.

CODE	MODE USE SERIES	MODEL USE [SYNONYMS NOT SHOWN]
2010	Capturing and Representing	2D Documentation
2020		3D Detailing
2030		As-constructed Representation
2040		Generative Design
2050		Laser Scanning
2060		Photogrammetry
2070		Record Keeping
2080		Surveying
2090		Visual Communication
3010	Planning and Designing	Conceptualization
3020		Construction Planning
3030		Demolition Planning
3040		Design Authoring
3050		Disaster Planning
3060		Lean Process Analysis
3070		Lift Planning
3080		Operations Planning
3090		Selection and Specification
3100		Space Programming
3110		Urban Planning
3120		Value Analysis
4010	Simulating and Quantifying	Accessibility Analysis
4020		Acoustic Analysis
4030		Augmented Reality Simulation
4040		Clash Detection
4050		Code Checking & Validation
4060		Constructability Analysis
4065		Construction Operation Analysis
4070		Cost Estimation
4080		Egress and Ingress
4090		Energy Utilisation (replaces Energy Use)
4100		Finite Element Analysis
4110		Fire and Smoke Simulation
4120		Lighting Analysis
4130		Quantity Take-off
4140		Reflectivity Analysis
4150		Risk and Hazard Assessment
4160		Safety Analysis
4170		Security Analysis

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CODE	MODE USE SERIES	MODEL USE [SYNONYMS NOT SHOWN]
4180		Site Analysis
4190		Solar Analysis
4200		Spatial Analysis
4210		Structural Analysis
4220		Sustainability Analysis
4230		Thermal Analysis
4240		Virtual Reality Simulation
4250		Life Cycle Assessment (replaces Whole Life Cycle Analysis)
4260		Wind Studies
5010	Constructing and Fabricating	3D Printing
5020		Architectural Modules Prefabrication
5030		Casework Prefabrication
5040		Concrete Precasting
5050		Construction Logistics
5055		Construction Waste Management
5060		Mechanical Assemblies Prefabrication
5070		Sheet Metal Forming
5080		Site Set-outs
6010	Operating and Maintaining	Asset Maintenance
6020		Asset Procurement
6030		Asset Tracking
6040		Building Inspection
6050		Handover and Commissioning
6060		Relocation Management
6070		Space Management
7010	Monitoring and Controlling	Building Automation
7020		Field BIM
7030		Performance Monitoring
7040		Real-time Utilization
7050		Structural Health Monitoring
8010	Linking and Extending	BIM/Spec Linking
8020		BIM/ERP Linking
8030		BIM/FM Integration
8040		BIM/GIS Overlapping
8050		BIM/IOT Interfacing
8060		BIM/PLM Overlapping
8070		BIM/Web-services Extension

CATEGORY III: Model Uses > Custom Model Uses

Custom Model Uses are a combination of *General* and *Domain* model uses. Custom MUs are tailored – when needed – to each project, Client/Employer, or market's specific modelling requirements. There is no fixed number of Custom MUs and are all organized under a single MU Series, Custom Modelling (9000-9990).

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The following are hypothetical *Custom Model Uses*:

- 9XXX Modelling of a floating sculpture with a wave-powered signalling beacon
- 9YYY Modelling security systems for a correctional facility
- 9ZZZ Modelling ventilation systems for an astronaut staging station on the moon

VI. Applications of Model Uses

Model Uses can be applied in a multitude of ways – including:

- → Model Uses can simplify the identification of **Information Requirements** within project protocols (e.g. Employer's Information Requirements);
- → Model Uses can facilitate the pre-qualification of organisations and the assessment of supply chain abilities; and
- → Model Uses can facilitate – when combined with Competency Items and Defined Roles - the development of learning modules and project task lists.

VII. More Info

The BIMe Initiative is currently developing sample Model Use templates, Information Exchange workflows and practical tools (matrices and online modules) that extend the application of Model Uses and connects them to Model View Definitions. To follow these developments, please follow the BIMe Initiative on Twitter (@BIMeInitiative) and/or subscribe to the Mailing List. If you'd like to participate in this effort, request more information or suggest an improvement, please Contact Us; thank you.

VIII. License to Use

IX. Change Log

VERSION	DATE	DESCRIPTION
0.1	Sep 9, 2015	First version (v0.76) published on BIMThinkSpace.com
0.2	July 6, 2016	Concepts updated after publication of Paper A10 (http://bit.ly/BIMPaperA10)
0.3	Feb 8, 2017	Updated Mode Use (4250) and added a new one (4065)
0.4	Oct 24, 2017	Updated Model Use (4090)
1.0	Oct 26, 2017	First released as a BIMe Initiative resource – 211in Model Uses Table
1.1	Oct 27, 2017	Typos removed,
1.2	Dec 27, 2017	Added 5055 Construction Waste Management and 7050 Structural Health Monitoring
1.25	Jan 27, 2019	Typo fixed

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