

BIM FOR QUANTITY SURVEYORS ENHANCING EFFICIENCY



Principal at BIM DnA Group

CEO (Past-President) buildingSMART Canada Director of Design Technologies at Diamond Schmitt Architect Director of Digital Practice at MJMA BIM Manager / Architect at Moriyama + Teshima Founder and Former Chair of torontoBIMcommunity Licensed with the OAA and an OAA Mentor University of British Columbia - Master's of Architecture Ryerson University - Bachelors in Architectural Science



what we do

Our focus is on preparing you in your own digital transformation journey that supports your unique business.





The chart below indicated the current state in the center (yellowish), the future state in middle (urange) **Current vs Future State** and the outline represents the idealized (optimal) digital maturity. The fature state is reasonable with effort needed in all domains. Overview Business The carrent state has been determined from the responses to the survey, the review of the documents, and takenegs from the workshops. Overall Comsists's digital practice average is "Defined": A digital strategy with gask and objectives has been owared but has yet to be incomposed into the but news or provide proceedings and contensity. However lay areas within each domain fail is the maturity level of Usedened as well as 'total'. The following section denotes the two preasons more default. Technology The current state of Curral as' digital practice is strongest in the Donain of People and evaluation the Donain of Business, the latter is also the Donain with the plan for most growth. The overall future state is the reach a digital maturity of 'Manage'. Digital Delivery has become the The overall funce tanks in the reach is digital maturity of Managel. Display Delivery has become the organization strateging process. Note and energosolible are under net and the site and shared BMA localedge and treascess while the approximation. The ignormal match has not believed display. The only dimensis high exceeding this treasing levels that prove and the important. The application has been as a distribution approximate, strateging an intergeliverup performance, increasing automatics, analying, and balance and polycower. Process People The area of none efforts in the next frience years will be in the lineareas and Process domains, a large component within the Damain of business in the development adoption of the dignal integration of the dintegration of the dintegration of the dignal The chart below illustrates the current status of maturity in each domain and the maturity level that will be achieved in three years, as well as the gap and level of affort required in each domain. The action items described later in this plan our line what is sequired within the three-year plan to move from an average digital impusty of Defined to Managed. Any and all meas can be escaeded but it is important that there is a conscientious effort from all sectors to keep the instative progressing incommunity or his functions that the hears not out can be achieved. Process Digital transformation is a journey that takes time and effort by many parties and enforced by leadership. No matter an organization's maturity level, new goals can always bo set. 1 2 3 4 5 0 0 1 2 3 5 4 ALC ME ALC ME Information

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Information



learning never ends

it enables adaptation and professional growth.



Keynotes Conferences Guest Lecturer Lunch n' Learns Con't Ed. Workshops Roundtables

FULL AGENDA

- 1. Overview
- 2. BIM Foundational Concepts
- 3. Business Benefits and Opportunities
- 4. How to get started
- 5. Q&A





CONVERGENCE

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While a quantity surveyor may use a BIM to speed up some basic quantity take-off, the true value of the quantity surveyor is not in counting objects in a model **rather**

The interrogation and analysis of the models. This enables the quantity surveyor to recommend alternatives and provide assurance to the client that the most cost-effective option has been put forward.



"The professional skill of a quantity surveyor is still needed for assessing the validity of the source data and source materials, ensuring the coverage of the take-off, proposing alternative solutions and analyzing the results."



MISCONCEPTIONS

All quantities reside within the model and can be taken from a BIM





MISCONCEPTIONS

An architect or engineer can extract quantities from a model, so they can now do the role of the quantity surveyor





MISCONCEPTIONS

Bill of Quantities can be produced with the click of a button



WHY IS BIM IMPORTANT FOR QUANTITY SURVEYORS?

- Leveraging the 3D model and information being generated by design and construction team
- Fast and efficient quantity validation and verification
- Rapid processing of design revisions/updates, More efficient identification and costing of design changes
- Quickly cost design options to allow early informed decisions



WHY IS BIM IMPORTANT FOR QUANTITY SURVEYORS?

- Increased visualization
- Efficient data extraction for estimating at various design stages, as well as leveraging off the model and producing schedules of quantities
- Opens new services opportunities and reframe the role of Quantity Surveyors in the supply chain



BIM FOUNDATIONAL CONCEPTS



BIM: BUILDING INFORMATION ... Defined as representing 3 separate but linked functions



BIM: BUILDING INFORMATION MODEL



Is the DIGITAL REPRESENTATION of physical and functional characteristics of a facility, a shared knowledge resource for information about a facility, forming a reliable basis for decisions during its entire life cycle.



BIM: BUILDING INFORMATION MODELING

Is a PROCESS for leveraging building data to design, construct and operate the building during its lifecycle. BIM allows all stakeholders to have access to the same information simultaneously through interoperability between different technology platforms.

Process



International Organization for Standardization





BIM: BUILDING INFORMATION MANAGEMENT



openBIM® Information

Management: Is the ORGANIZATION & CONTROL of the process by utilizing the information in the digital prototype to affect the sharing of information over the entire lifecycle of an asset, effectively developing an asset lifecycle process and model from conception to retirement.





BIM is the use of a **shared digital representation** of a **built asset** to facilitate design, construction and operation processes to form **a reliable basis for decisions**.

Definition according to ISO 19650-1 / ISO 29481-1:2016



FUTURE DIRECTION





INFORMATION



Component Based

Information + Geometry

Image source: M. Baldwin, The BIM Manager (2018)



INFORMATION - TRADITIONAL WORKFLOW

Design	Tender	Construction	Operation



INFORMATION - BIM WORKFLOW





COLLABORATION





MACLEAMY CURVE





WHAT IS openBIM?

enables global universal data-sharing for BIM data regardless of proprietary BIM platform or BIM tool



Technical Documents



INDUSTRY FOUNDATION CLASS



BUSINESS BENEFITS AND OPPORTUNITIES



INTEGRATED IN THE PROCESS

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ANALYSIS





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PROPERTY CONDITIONS ASSESSMENT



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Source: Adapted from the World Green Building Council, Global Status report, 2019.

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HOW BIM WORKS



QUANTITY SURVEYOR'S INPUT





BIM EXECUTION PLAN

describes HOW it should be done.

A BEP should include:

The **name(s) of the person(s)** who will perform the information management function within the project team.

The strategy for the **delivery of information** by the team (e.g. **MIDP - Master Information Delivery Plan**)

The team's responsibility matrix.

The team's proposed methods and procedures for information production.

A **list of the software, hardware** and IT infrastructure that the team will use.



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BIM USES

х	PLAN	х	DESIGN	х	CONSTRUCT	х	OPERATE
	PROGRAMMING		DESIGN AUTHORING		SITE UTILIZATION PLANNING		BUILDING MAINTENANCE SCHEDULING
	SITE ANALYSIS		DESIGN REVIEWS		CONSTRUCTION SYSTEM DESIGN		BUILDING SYSTEM ANALYSIS
			3D COORDINATION		3D COORDINATION		ASSET MANAGEMENT
			STRUCTURAL ANALYSIS		DIGITAL FABRICATION		SPACE MANAGEMENT / TRACKING
			LIGHTING ANALYSIS		3D CONTROL AND PLANNING		DISASTER PLANNING
			ENERGY ANALYSIS		RECORD MODELING		RECORD MODELING
			MECHANICAL ANALYSIS				
			OTHER ENG. ANALYSIS				
			SUSTAINABLITY (LEED) EVALUATION				
			CODE VALIDATION				
	PHASE PLANNING		PHASE PLANNING		PHASE PLANNING		PHASE PLANNING
	COST ESTIMATION		COST ESTIMATION		COST ESTIMATION		COST ESTIMATION
	MODELING		MODELING		MODELING		MODELING

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	P-primary use S-secondary use A-auxiliary use Potential BIM Uses	BIM Use Description	OWNER	CONSTRUCTOR	ARCHITECT	STRUCTURAL	MECHANICAL	ELECTRICAL	CIVIL	FABRICATORS
	3D Coordination/ Clash Detection ^P	Using 3D models to coordinate different disciplines (e.g. structural and mechanical) and to identify/resolve possible clashes between virtual elements prior to actual construction or fabrication.		•	•	•	•	•	•	•
	Design Review ^p	A process in which stakeholders view a 3D federated model and provide their feedbacks to validate multiple design aspects. These aspects include evaluating meeting the program, previewing space aesthetics and layout in subtrue one meet	•		•	•	•			
	Quantity Take-Off/ Cost Estimation ^P	A BIM Use representing how models are used to generate feasibility studies and compare different budgetary options and the use of models to calculate the quantity of Furniture, Fixtures and Equipment or building materials for the purpose of generating Cost Estimates.		•	•					
	Validation ^s	predefined specifications or established design, performance or safety codes.			•	•	•	•		
	Egress and Ingress ^S	A BIM Use where models are used to simulate individual/crowd behaviour within a building, either during normal operations or during emergency situations. Ejrees and Ingress simulations assist in identifying and improving access, circulation and exit routes.	•		•				•	
	Site Analysis ^p	A BIM Use where BIM Software Tools and/or Geographic Information System tools are used to decide on optimal site for a building project and/ or to decide the optimal building location within a specified site.	•		•				•	
	Solar Analysis ^p	A BIM Use where models are used to conduct shadow studies, simulate solar radiance on building envelopes, and analyze the effect of building location/shape on solar heat loadsAlso refer to Reflectivity Analysis.	•		•					
	Lighting Analysis ^p	Using models to simulate natural and artificial lighting levels. This BIM Use is a form of Building Performance analysis and is not intended for rendering or visualization.	•		•			•		
	Energy Use ^p	A BIM Use and a Building Performance metric measuring how and how- much a facility will consumes energy in a comparative way.	•		•		•	•		
5	Thermal Analysis ^S	Using the model to analyze thermal loads, inform Mechanical Systems' Design and relevant Materials' Selection. Thermal Analysis is part of overall Building Performance analysis and measurement.	•		•		•			
	Wind Studies ^S	The use of models to simulate the effects of wind on structures. The simulation is intended to inform the design process by identifying optimal orientations and shapes. Models of existing structures may also be used for the purposes of performing Wind Studies.			•	•				
	Sustainability Analysis ^S	Using the model to calculate the environmental impact of a new construction project or an existing facility. These calculation may include Carbon Footprint, Life Cycle Assessment, Embodied Energy and other sustainability metrics (Often refers to the LEED point system).	•		•					
	Phase Planning ^P	A process in which a 4D model (3D models with the added dimension of time) is utilized to effectively plan the phased occupancy in a renovation, retrofit, addition, or to show the construction sequence and space requirements on a building site. 4D modelling is a powerful visualization and communication tool that can give a project team, including the owner, a better understanding of project milestones and construction plans.	•	•						

LEVEL OF DEVELOPMENT





MODEL ELEMENT TABLE

MODEL ELEMENT TABLE

Project Number: {ENTER PROJECT NUMBER HERE}

Project Name: {ENTER PROJECT NAME HERE}

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			Elen	ent in	SCHER	SOLTAR	DES	IGN	DES	SIGH	CONST	RUCTI	CONST	RUCTI	CONST	RUCTI	CONST	FRUCTI			CONST	BUCTI			
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item 8	Description	Minimum Sixo Roquirod tu bo Hudolod	Ar en abject	Ar e detail	LOD	HEA	LOD	HEA	LOD	HEA	LOD	MEA	LOD	HEA	LOD	HEA	LOD	HEA	LOD	MEA	LOD	MEA	LOD	MEA	
10100	VISUAL DISPLAYS, CHALK AND TACK BOARDS		YES	YES	100	ARCH	100	ARCH	100	ARCH	100	ARCH	200	ARCH	200	ARCH	300	ARCH	300	ARCH					
10250	ACCESS PANELS - WALL & CEILINGS		NO	YES	N/A	N/A	N/A	N/A	100	ARCH	100	ARCH	100	ARCH	200	ARCH	200	ARCH	200	ARCH					
10260	WALL/CORNER GUARDS		NO	YES	N/A	N/A	N/A	N/A	100	ARCH	100	ARCH	100	ARCH	200	ARCH	200	ARCH	200	ARCH					
10270	ACCESSFLOORING		NO	YES	N/A	N/A	N/A	N/A	100	ARCH	100	ARCH	100	ARCH	200	ARCH	200	ARCH	200	ARCH					
10400	ILLUMINATED SIGNAGE		NO	NO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A					
10500	LOCKERS		YES	YES	100	ARCH	100	ARCH	200	ARCH	200	ARCH	200	ARCH	300	ARCH	300	ARCH	300	ARCH					
10510	FIRE CABINETS		YES	YES	100	ARCH	100	ARCH	200	MECH	200	MECH	200	MECH	300	MECH	300	MECH	300	MECH					
10520	FIRE EXTINGUISHERS		YES	YES	100	ARCH	100	ARCH	200	MECH	200	MECH	200	MECH	300	MECH	300	MECH	300	MECH					
10550	POSTAL SPECIALTIES		NO	NO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A					
10610	TOILET PARTITIONS		YES	NO	100	ARCH	100	ARCH	100	ARCH	100	ARCH	200	ARCH	200	ARCH	297	ARCH	297	ARCH					
10650	OPERABLE PARTITIONS		YES	YES	100	ARCH	100	ARCH	100	ARCH	100	ARCH	200	ARCH	200	ARCH	298	ARCH	298	ARCH					
10670	STORAGE SHELVING		YES	YES	100	ARCH	100	ARCH	200	ARCH	200	ARCH	200	ARCH	300	ARCH	299	ARCH	299	ARCH					
10800	WASHROOM ACCESSORIES		YES	YES	N/A	N/A	100	ARCH	100	ARCH	100	ARCH	100	ARCH	200	ARCH	300	ARCH	300	ARCH					
EQUIPH	ENT																								
11010	WINDOW WASHINGEQUIPMENT (ANCHORS)		NO	YES	N/A	N/A	N/A	N/A	100	ARCH	100	ARCH	100	ARCH	200	ARCH	200	ARCH	200	ARCH					
11020	SECURITY (CCTV CAMERAS, PANELS)		NO	YES	N/A	N/A	N/A	N/A	100	ELEC	100	ELEC	100	ELEC	200	ELEC	200	ELEC	200	ELEC					
11130	PROJECTORS, SCREENS, A/VEQUIPMENT		NO	YES	N/A	N/A	N/A	N/A	100	ARCH	100	ARCH	100	ARCH	200	ARCH	200	ARCH	200	ARCH					
11150	PARKING CONTROL EQUIPMENT		NO	NO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A					
11160	LOADING DOCK EQUIPMENT		NO	NO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A					
11170	WASTEHANDLING		NO	NO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A					
11400	BUILT-IN FOOD SERVICE EQUIPMENT		NO	NO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A					
11410	LARGE PORTABLE FOOD SERVICE EQUIPMENT		NO	NO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A					
11430	WALK-IN COOLERS AND REFRIGERATION		NO	NO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A					
11480	ATHLETIC, THERAPEUTIC EQUIPMENT		NO	NO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A					
11500	INDUSTRIAL PROCESS EQUIPMENT		NO	NO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A					
11600	BUILT-IN LABORATORY EQUIPMENT		NO	NO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A					
11700	BUILT-IN MEDICAL EQUIPMENT		NO	NO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A					
11800	BUILT-IN LAUNDRY EQUIPMENT		NO	NO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A					
FIXTURE	S, FURMITURE, AND EQUIPMENT																								
12010	BUILT-INFURNITURE		NO	NO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A					
12020	LOOSEFURNITURE		YES	YES	N/A	N/A	100	ARCH	100	ARCH	100	ARCH	100	ARCH	200	ARCH	200	ARCH	200	ARCH					
12500	WINDOW TREATMENT		YES	YES	N/A	N/A	100	ARCH	100	ARCH	100	ARCH	100	ARCH	200	ARCH	200	ARCH	200	ARCH					
12690	PERMANENT FLOOR MATS AND FRAMES		YES	YES	N/A	N/A	100	ARCH	100	ARCH	100	ARCH	100	ARCH	200	ARCH	200	ARCH	200	ARCH					
12710	AUDITORIUM AND THEATRE FIXED SEATING		NO	NO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A					
12800	BUILT-IN INTERIOR PLANTERS		NO	NO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A					
12810	INTERIOR PLANS AND VEGETATION		NO	NO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A					



File Name: 2 - DSAI-MET-Template_v2

QUALITY ASSURANCE & CHECKS

Digital Quality Assurance and Quality Control Strategy / 23

QA QC

Digita

Strategy

Digital Quality Assurance and Quality Control Strategy / 22

Quality Assurance

The following act processes for dig projects. Improv Plan require cont decrease risk.

1. Determine who 2. Outline the area

included:

a. BIM Stand

b. BIM Execu

c. Quality Co

d. Upskilling
 e. Lessons L

f. BIM Resou

- 3. Determine the a
- 4. Determine the a
- the role of QA,
- 5. Determine the a



The following action items will enable Quality Control processes for digital practice across the organization and projects. Improvements to the Quality Control Strategy and Plan require continuous improvement to increase <u>quality and decrease</u> risk.

Determine who will spearhead
 Outline the areas of focus, the

included: **a.** BIM Standards and Guid

b. BIM Execution Plan temp
 c. Drawing Checks

d. Model Coordination Che



- f. BIM Resources
- g. Issue Tracking
- 3. Determine the approach for c
- Determine the approach for re importance
- 5. Determine the approach for u





Improve Quality Reduce Costs Stay compliant

QC



HOW TO GET STARTED



CHANGE CAN BE UNCOMFORTABLE



"I want you to find a bold and innovative way to do everything exactly the same way it's been done for 25 years."



boration

USE CASES

2D Drawing Development

lt



and Pedestrian Simulati...





Design Authoring



3D Coordination



3D Detailing



5D - Cashflow



City Information Model







Code Checking



Digital White Boards







Conceptualizatio





Existing Condition









Energy Analysis

VISION









DIGITALIZATION IS JOURNEY



BIMD

Claudia Cozzitorto

OAA, CCMP, MRAIC, LEED AP, M.Arch, B.Arch Sci Principal

claudia@bimdnagroup.ca

THANK YOU



digitalization is a journey those who adapt, lead

