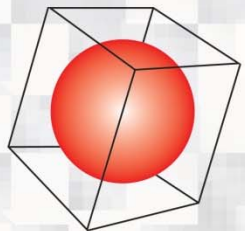


BIM IN CANADA

Where we are, and where we are going



IBC
Institute for BIM in Canada

Bob Hildenbrandt, Chair, Institute for BIM in Canada
June 29, 2016

INTRODUCTION – IBC

- The Institute for BIM in Canada (IBC)
 - Established in 2011
 - Made of up four constituent organizations and Owner representatives
 - Architecture Canada (RAIC)
 - Association of Consulting Engineers – Canada (ACEC)
 - Canadian Construction Association (CCA)
 - Construction Specifications Canada (CSC)
 - Owner representatives from DND and DCC

INSTITUTE FOR BIM IN CANADA

- Mission: To lead and facilitate the coordinated use of BIM in the design, construction, and management of the Canadian built environment
 - Driven by the notion that:
 - » All stakeholders understand their roles and responsibilities as it relates to BIM
 - » Can assess their capacity to participate in the BIM process

WHAT IS BUILDING INFORMATION MODELLING (BIM)?

- BIM is a process; more than just a technology.
- Not exclusively for “buildings.”
- Value of BIM lies in the “Information,” or data.
- All stakeholders can achieve value through the BIM process.
 - Architects, Engineers, Contractors, Owners, and Operators (or Facility Managers).

THE BIM PROCESS



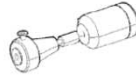

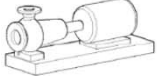

- A collaborative practice of creating, using, and maintaining models, including:
 - Information Exchange – communicating agreed to information between various stakeholders
 - BIM Use – defines the process (ie. 3D coordination for clash detection) to use BIM to support larger organizational goals or business objectives

MODELS

- Two critical concepts to the use of BIM models:

Level of Development – indicates the stage of development each element in a model has achieved – evolves during the process

Model Organization – how far models are developed depends on initial business case for BIM

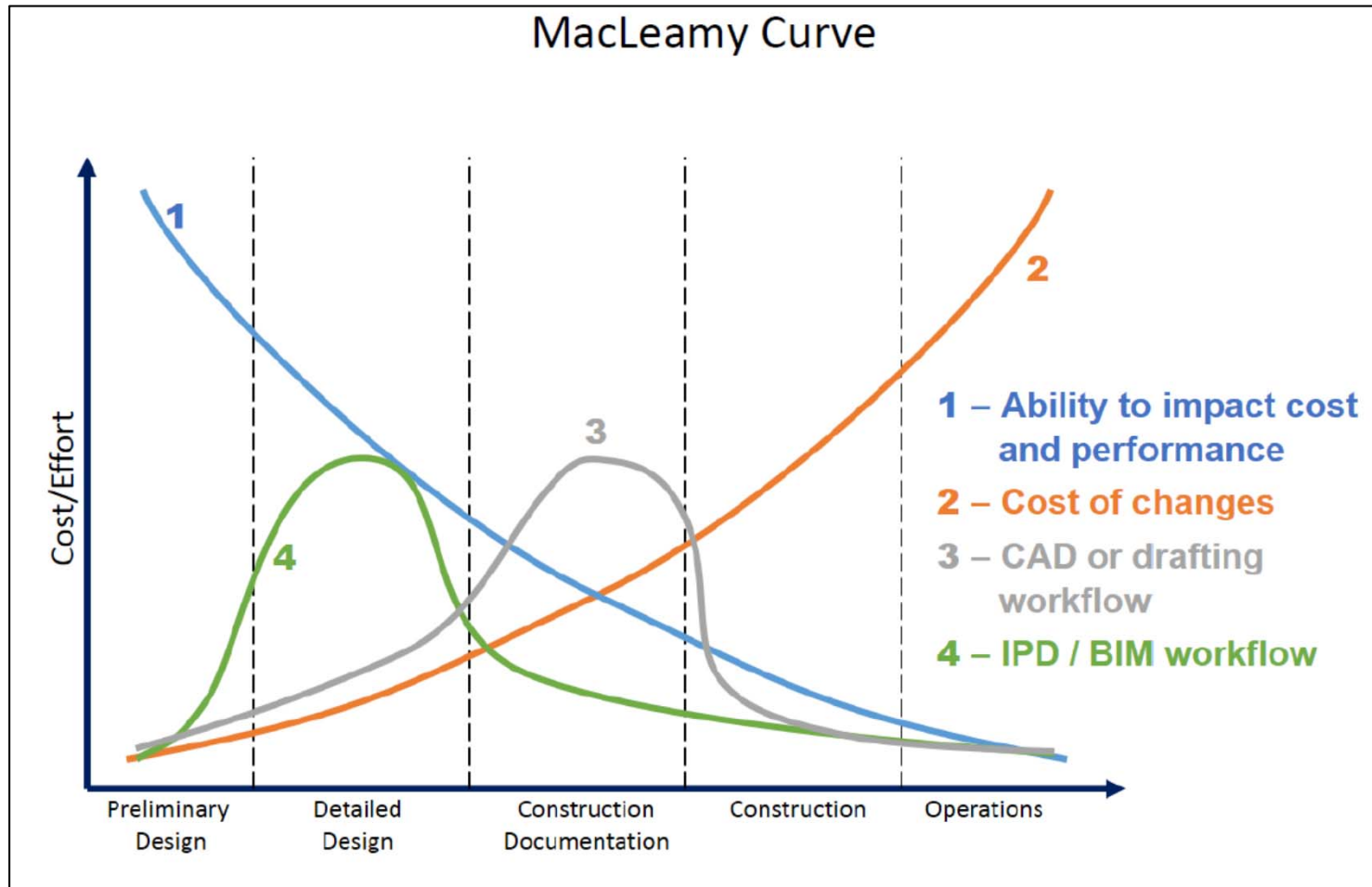
		LOD 100 	LOD 200 	LOD 300 	LOD 400 	LOD 500 
Level of Development		Conceptual (Visualization)	Design Development	Documentation	Construction	Facilities Management
Description		Pump	Centrifugal Pump	Centrifugal Pump	Centrifugal Pump	Centrifugal Pump
Max Pressure			2.5 Mpa	2.5 Mpa	2.5 Mpa	2.5 Mpa
Capacity			2400 m ³ /h	2400 m ³ /h	2400 m ³ /h	2400 m ³ /h
Head			250m	250m	250m	250m
Temperature			-20 to 200 C	20 to 200 C	20 to 200 C	20 to 200 C
Seal				Mechanical	Mechanical	Mechanical
Type				End Suction	End Suction	End Suction
Manufacturer					Torontech	Torontech
Model					API 610	API 610
Purchase Date						2013-MAY-11
Location						Room # M105

Examples of various Levels of Development (LOD) from concept/design through to facility management

WHY USE BIM?

- Industry demands are evolving for all stakeholders:
 - Owners/Operators – minimizing operation and maintenance costs in the short term; renovation costs in the long term.
 - Contractors – managing larger and more complex projects while reducing costs and maximizing efficiencies.
 - Designers – increased pressure on time and costs while producing cost-effective and innovative designs.
 - Others – manufacturers wish to position products; regulatory bodies need to ensure facilities meet community needs; lenders/insurers need to understand their financial investments.
- BIM is a technological solution to industry needs.

WHY USE BIM?



BIM ADVANTAGES - OWNERS

- Design Phase
 - Cost effective visualization of data and proposed design
- Construction Phase
 - Improved communication and collaboration amongst design and construction teams
- Handover and Facility Management
 - Access to accurate and complete digital information for renovations, ordering parts, scheduled maintenance etc.

BIM ADVANTAGES - DESIGNERS

- Phase Planning
 - Assist in construction scheduling
- Authoring
 - Facilitates the tracking and communication of changes to design
- Reviews
 - Can assist in the identification of clashes, or when constructability may be affected
- Estimation
 - Measurements can quickly (or automatically) be extracted to assist in estimation
- Communicating/Programming
 - Can assist in communicating with Owners on design concepts
- Site Analysis

BIM ADVANTAGES - CONTRACTORS

- 4D Coordination
 - Assist in construction scheduling
- Site Utilization
 - Can be used to model workflow for material and labour
- Digital Fabrication
 - Provides the means to fabricate components off-site for on-site assembly
- Record Modelling
 - Photographs, combined with as-built models, can document construction
 - Part and serial numbers can be linked with the model
 - Provides a record of construction
- Handover
 - The as-built model can be include construction records, equipment specifications, databases etc. or other Owner requirements

FACILITATING BIM ADOPTION

- IBC has introduced and published a number of valuable resources related to BIM in Canada
 - Guide on the Benefits of BIM for Owners (free download)
 - Project Execution Plan Toolkits
 - Design Development
 - Construction Phase
 - Handover and Maintenance
 - Contract Language Appendix (IBC 100 – 2014) and Guide
 - Canadian Practice Manual for BIM (Three Volumes)
 - Volume One – BIM: A Primer
 - Volume Two – BIM: Company Context
 - Volume Three – BIM: Project Context

WHERE ARE WE?

What are Contractors actually doing?

- Varied – still in “innovators and early adopters” stage
- Depends on the firm
- More common uses:
 - Sales tool or Business Development resource
 - Some trades categories – e.g. structural steel; mechanical trades are also generally further ahead
 - Specific project elements or temporary construction services

WHERE ARE WE?

What are Contractors actually doing?

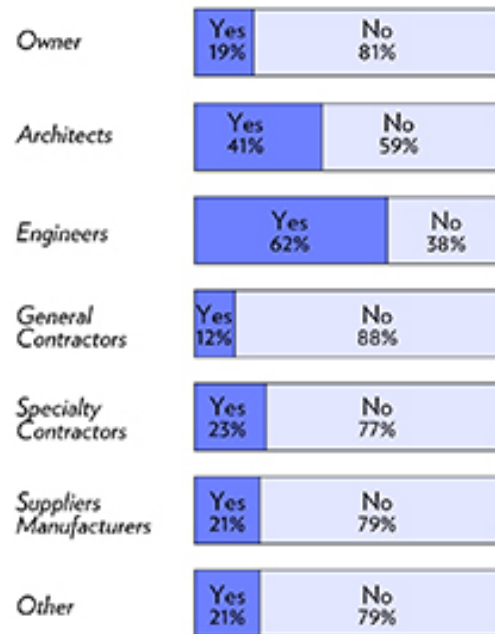
- Select projects – design/build, IPD, P3 projects
- Often the design is completed in Revit or similar software, and model is shared with the team
- Clash detection & constructability; estimating; scheduling; site management; and record drawings
- For “standard” project, some design is completed in BIM
- In a number of cases now, shop drawings are being prepared, submitted and reviewed in digital format
- Not all designers are willing to share their models

BIM ADOPTION – QUEBEC SURVEY

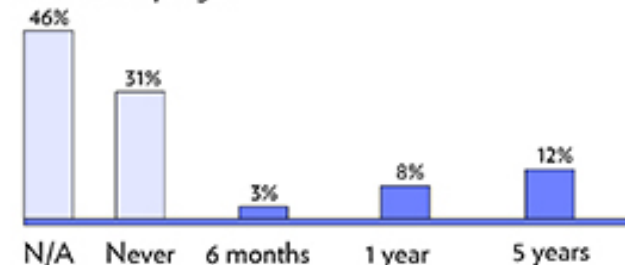
Adoption & implementation in the province of Quebec - 2015

Building Information Modeling (BIM)

Adoption rate



If you haven't adopted BIM yet, when do you envision adopting it?



TOP 5 barriers to adoption (non-adopters)

1. Lack of demand - clients
2. Lack of demand - supply chain
3. Cost of software
4. Cost of training
5. Cost of infrastructure

ENGAGING IN BIM

- How to engage in BIM?
 - Utilize existing processes
 - Establish a BIM Plan
 - Identify current capabilities
 - Identify BIM goals
 - Identify a strategic plan for BIM
 - For companies
 - Identify a BIM Champion
 - For Project
 - Project Execution Plan (PxP)

ENGAGING IN BIM

Final Considerations:

- It is OK to start small
- People drive BIM; not technology
- Know your role and responsibilities
 - Identify the data needed, and the data you create
 - Understand your PxP
 - Understand the contractual obligations

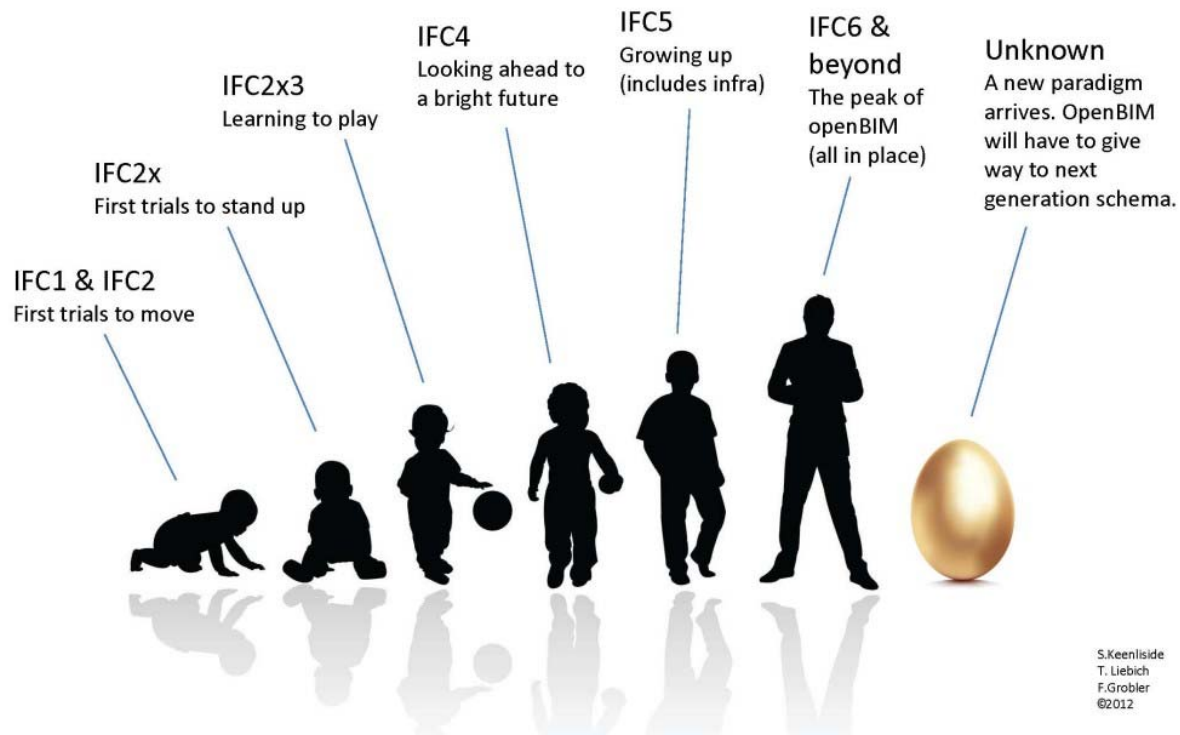
WHAT IS OPEN BIM?

OPEN BIM – INDUSTRY FOUNDATION CLASS

- Industry Foundation Class (IFC)
 - An open standard that is part of Open BIM; not solely Open BIM
 - Began 20 years ago - Currently at IFC4
 - Not the only standard for BIM - ISO standards exist, but IFC published as an ISO standard
 - More information on IFC and Open Standards - <https://prezi.com/c8dxgpbzm8xp/open-bim-standards-in-2015/>

OPEN BIM – INDUSTRY FOUNDATION CLASS

IFC – Levels of Maturity



OPEN BIM - WHERE IS CANADA GOING?

- Established the Canadian Chapter of buildingSMART International – buildingSMART Canada



- Canadian BIM Standards Development through development of international BIM standards
- Promote awareness of buildingSMART International (bSI) within Canada
- Support the implementation of BIM – improve project delivery and lifecycle management of the built environment, including infrastructure
- Participate in realizing international standards in interoperability of data, consistency and efficiency in work processes, and optimization of information classification systems

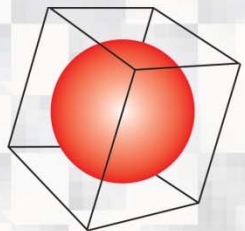
WHAT IS NEXT?

- Moving towards full BIM... but when?
- Greater collaboration
- Increased training
- Appealing to younger generations
- Government mandates?

QUESTIONS?

www.ibt-bim.ca

www.buildingsmartcanada.ca



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