



Benchmark of Alberta's AEC Industries' Knowledge of Building Information Modeling (BIM)

Basel Abdulaal, Ahmed Bouferguene, Mohamed Al-Hussein
Department of Civil & Environmental Engineering
Hole School of Construction – University of Alberta

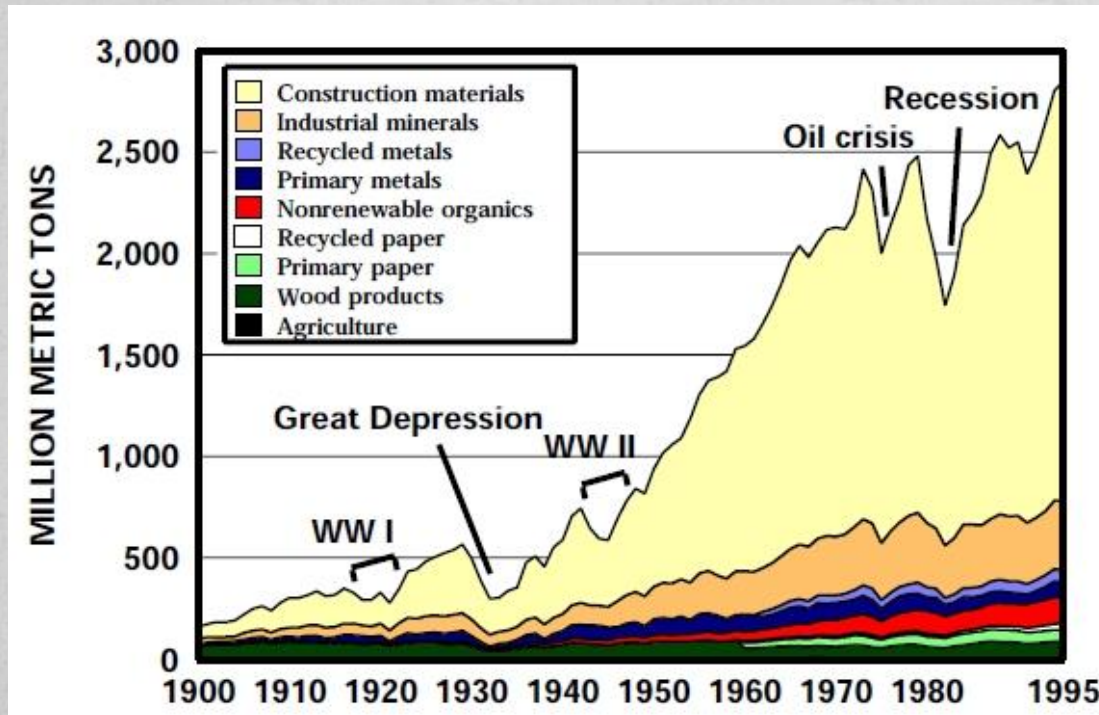
Yet, another point of view (not a definition) of what is BIM!

- Fact #1: Infrastructures are naturally 3-dimensional
- Fact #2: A given infrastructure goes through 3 major stages:
 - Design
 - Construction
 - Maintenance
- Fact #3: A given infrastructure requires financing \$\$\$
- Fact #4: A given infrastructure must be delivered within a specific timeframe
- Fact #5: All the above are interconnected thus correlated!

Since BIM is about information we can see it as a model of a **living** infrastructure at the center of which is (**probably**) a **nD** model to which are attached ALL the relevant information corresponding to 3 major periods of the life cycle: **Before**, **During** and **After** the infrastructure is built.

A point of view on “Why do we need BIM”

- One word answer: Efficiency!
 - Efficiency = Sustainability + Quality + Profitability
- A look into material consumption: The case of US†



Raw material consumption in the United States between 1900 and 1995

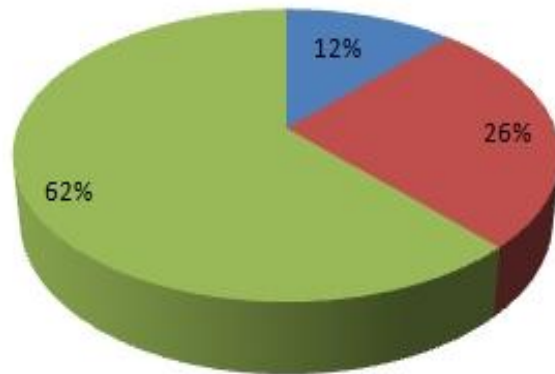
40% of global raw materials are consumed by buildings

Consumption of construction material increases at an alarming speed!

Inefficiencies and waste in the construction industry

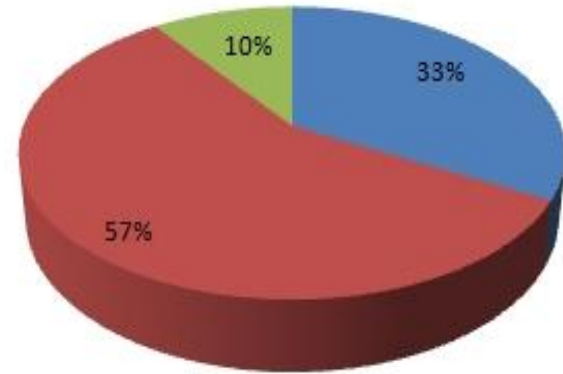
- A NIST study from 2004 targets lack of AEC software interoperability as costing the industry \$15.8B annually
- A US Bureau of Labor Statistics study shows construction alone, out of all non-farm industries, as decreasing in productivity since 1964, while all other non-farm industries have increased productivity by over 200% during the same period †

US Manufacturing industry



■ Support activity ■ Waste ■ Value added

US Construction industry



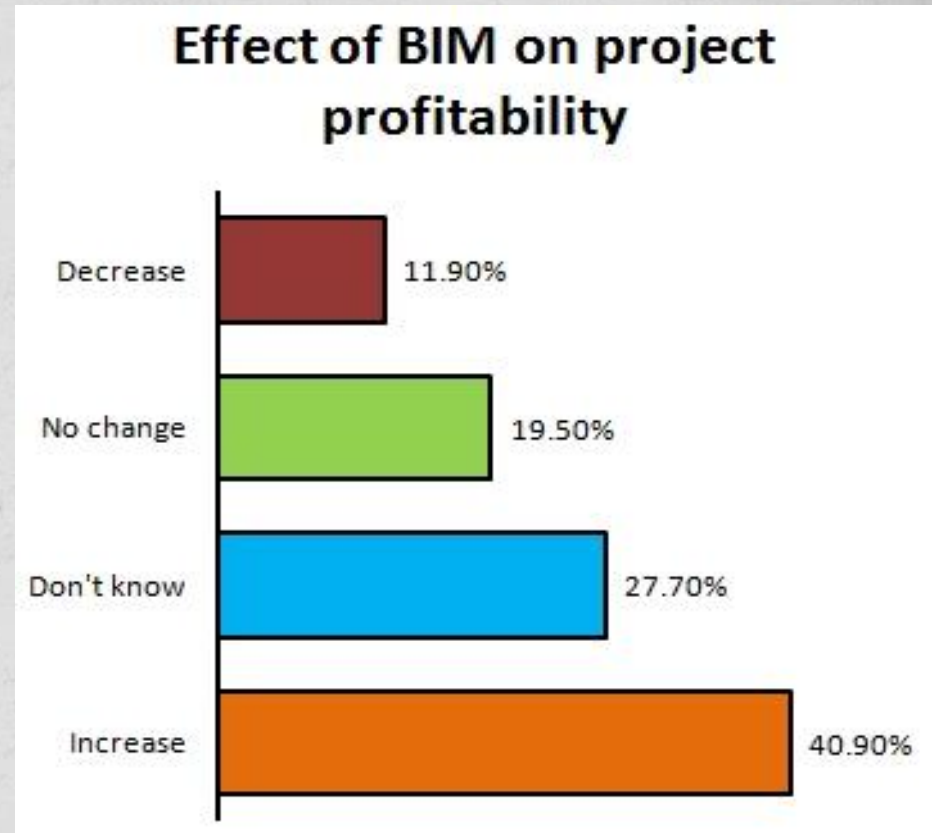
■ Support activity ■ Waste ■ Value added

Manufacturing versus Construction industry

† Comparative Efficiency of Industries (after D. Smith, NIBS, 2009)

BIM: A path to profitability

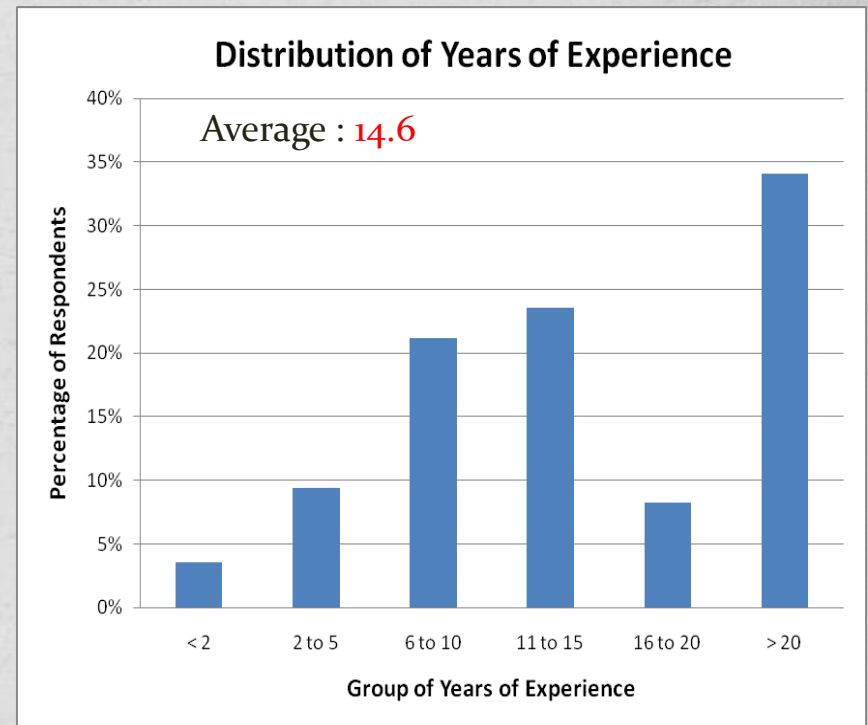
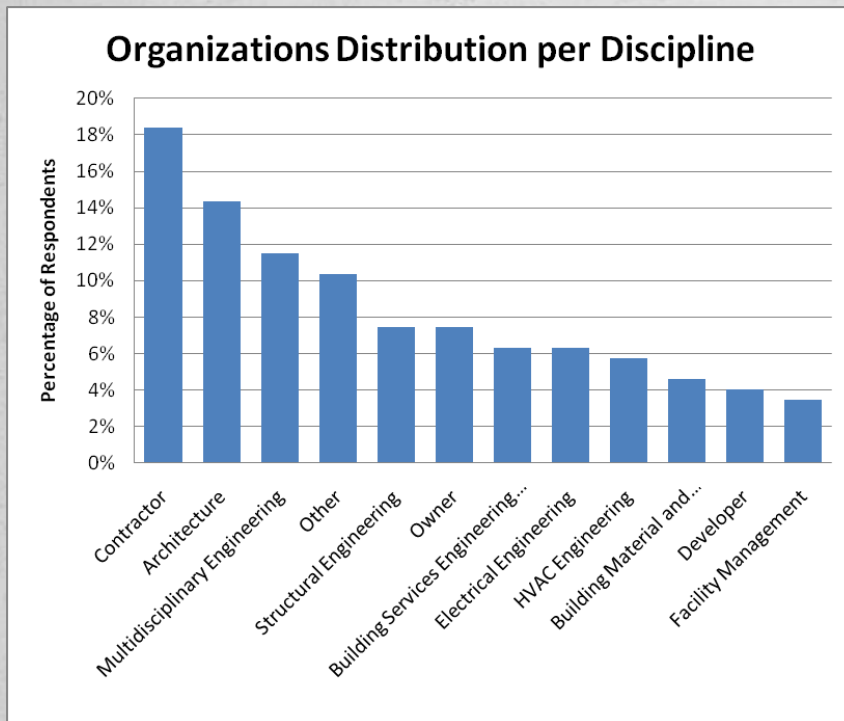
- According to McGraw-Hill Construction Research and Analysis†, implementation of BIM technology has positive financial impacts



†Young, N., Jones, S., Bernstein, H. M., Gudgel, J., (2009), *THE BUSINESS VALUE OF BIM, Getting Building Information Modeling to the Bottom Line*, SmartMarket-Design and Intelligence Report, , McGraw-Hill Construction (2009)

A snapshot on the state of BIM in the
AEC industries of Alberta

- In May 2010, a survey geared to probe the level of BIM usage in the Alberta construction industry was provided to 140 participants at a workshop on BIM held at the University of Alberta.
- Out of the 140 workshop participants, 80 of them took the survey.

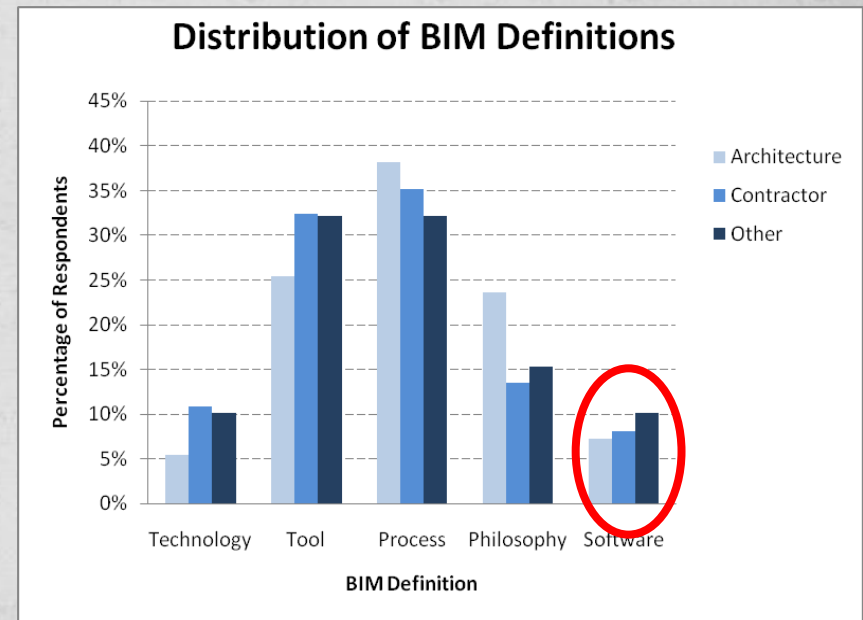
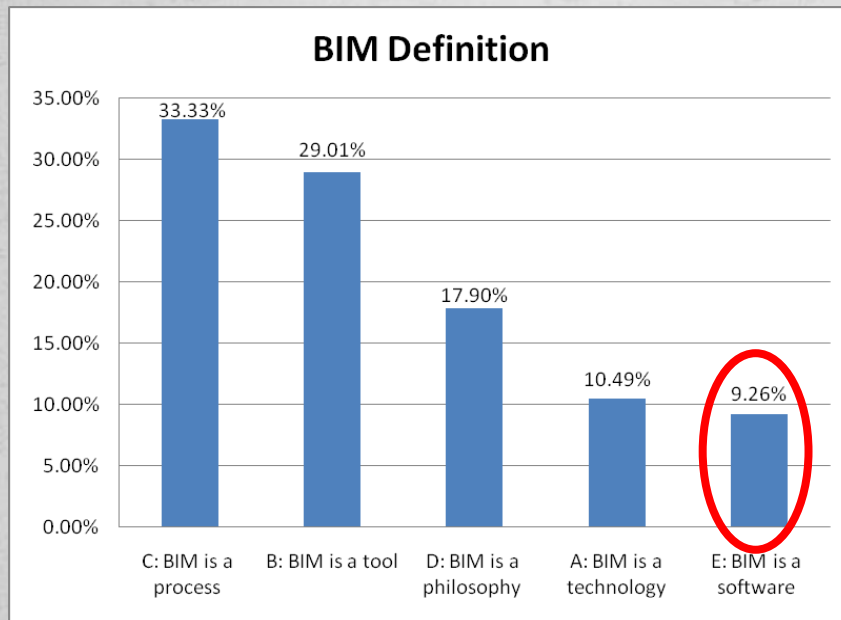


Architecture + Multidisciplinary Eng.	Architecture + Elec. Eng.	Architecture + Structural Eng.	Architecture + Building Services (HVAC and Elec.)	HVAC Eng. + Multidisciplinary Eng.
13.75%	10.00%	8.75%	8.75%	8.75%

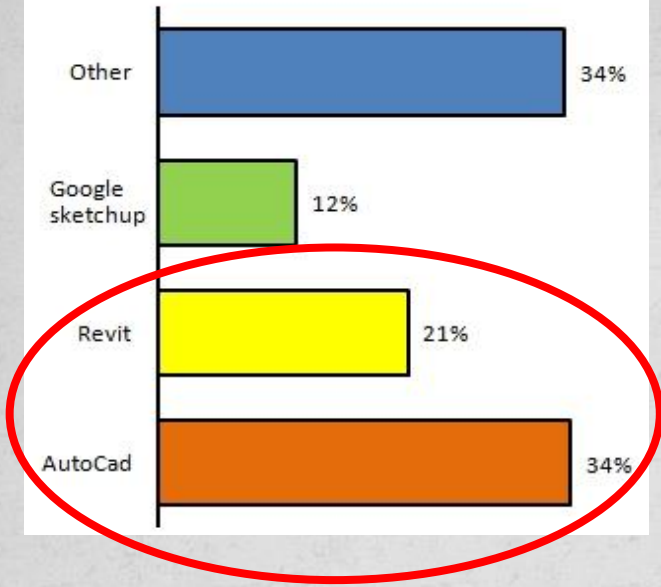
Knowledge of BIM: “What is BIM ?”

How would you describe BIM?

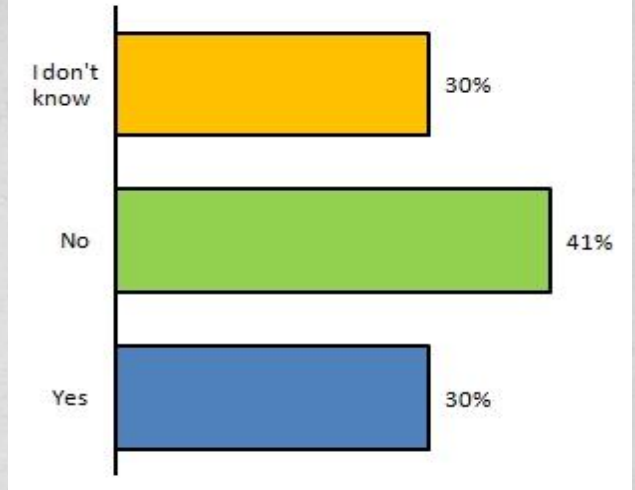
- a technology
- a philosophy
- a tool
- a software
- a process



Drafting/Design Tool Used in Organizations

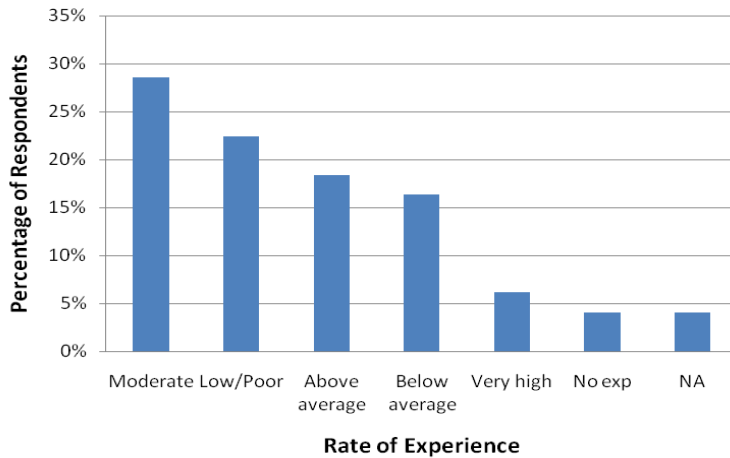


Autocad and Revit answers to "Do you have software that support BIM?"

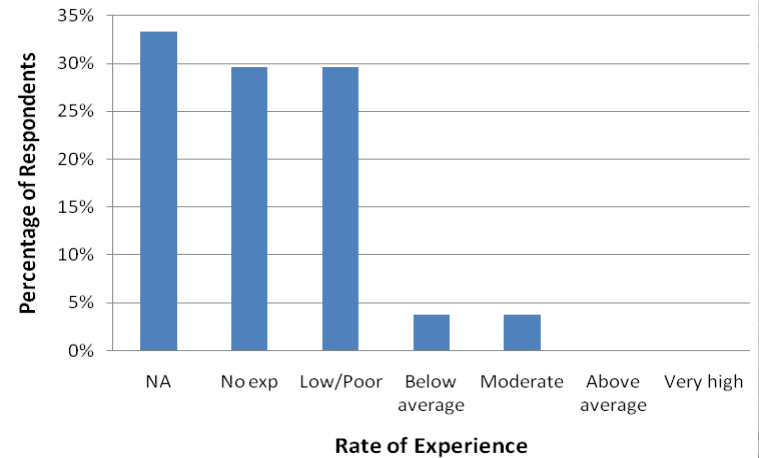


Organization experience/knowledge of BIM

Distribution of "YES" Answers



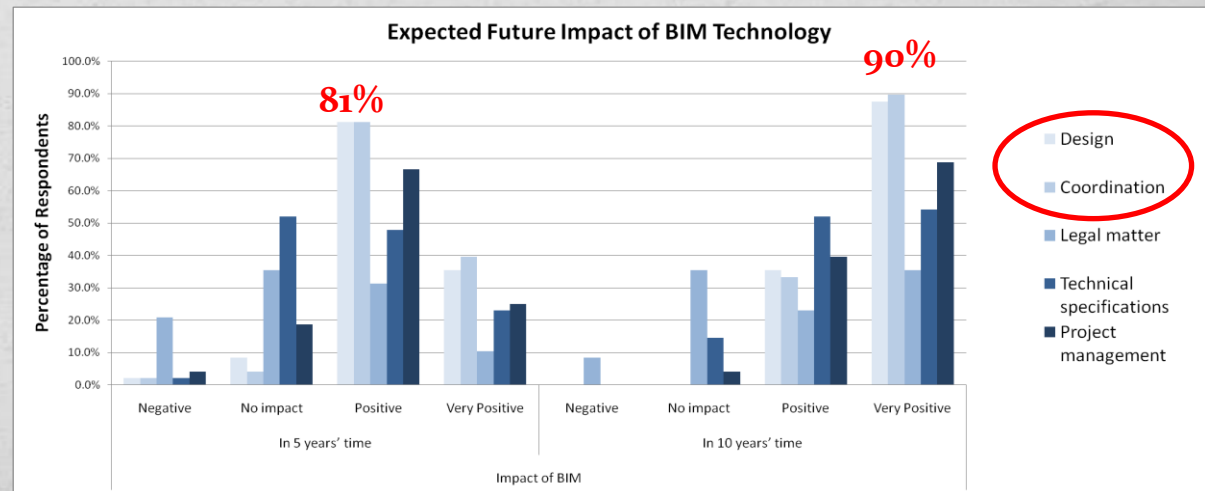
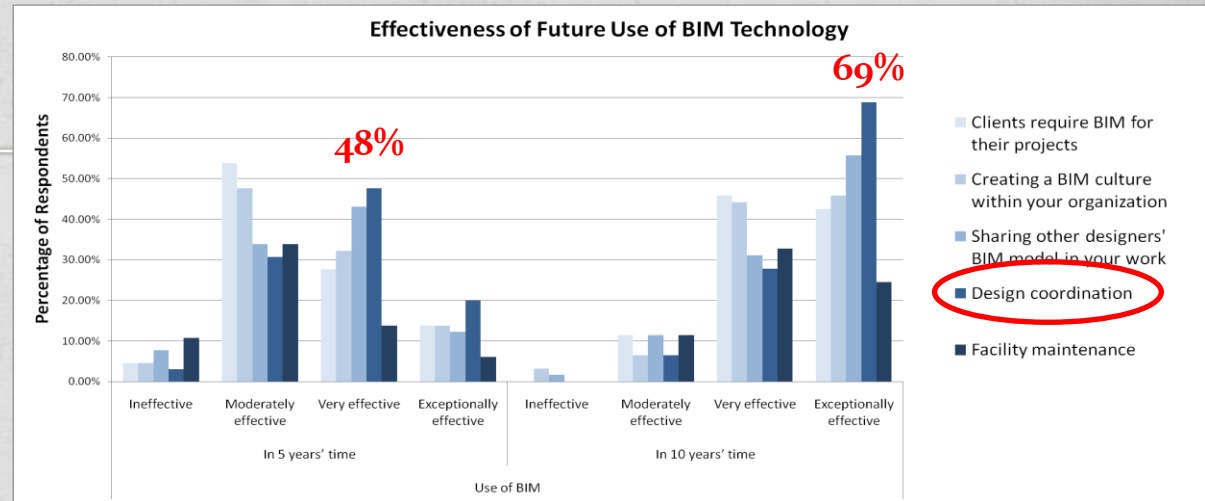
Distribution of "No+Don't know" Answers



Motivations of BIM implementation

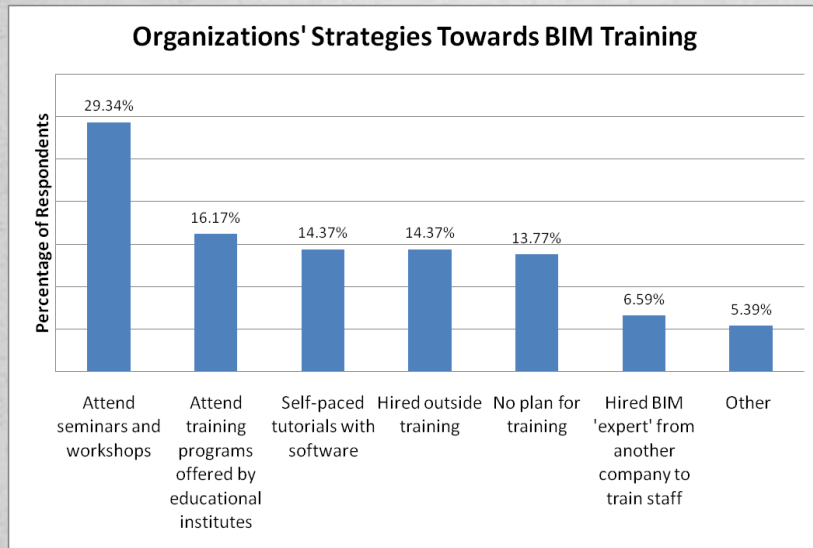
Rate to what degree you think BIM will be used in your field?

In your opinion, what kind of impact BIM will have on your field of practice?

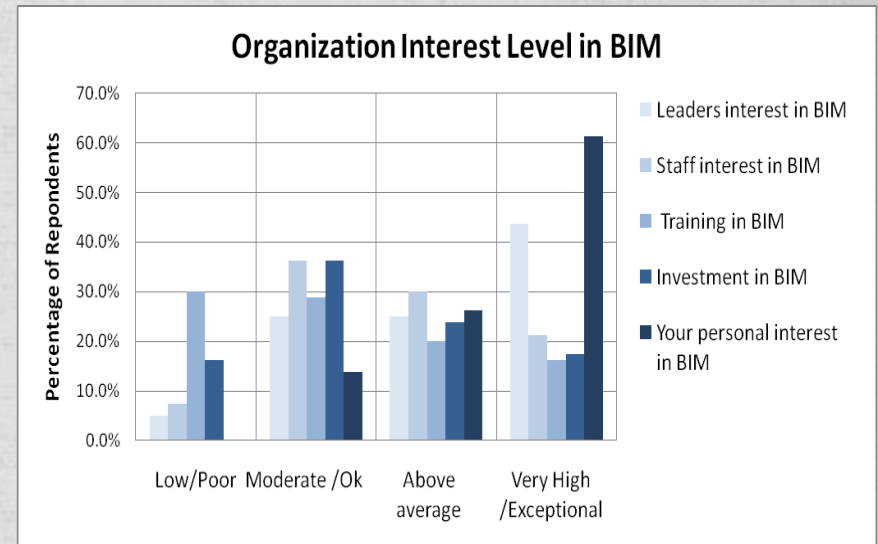


Training method

What is your organization's strategy towards BIM training?

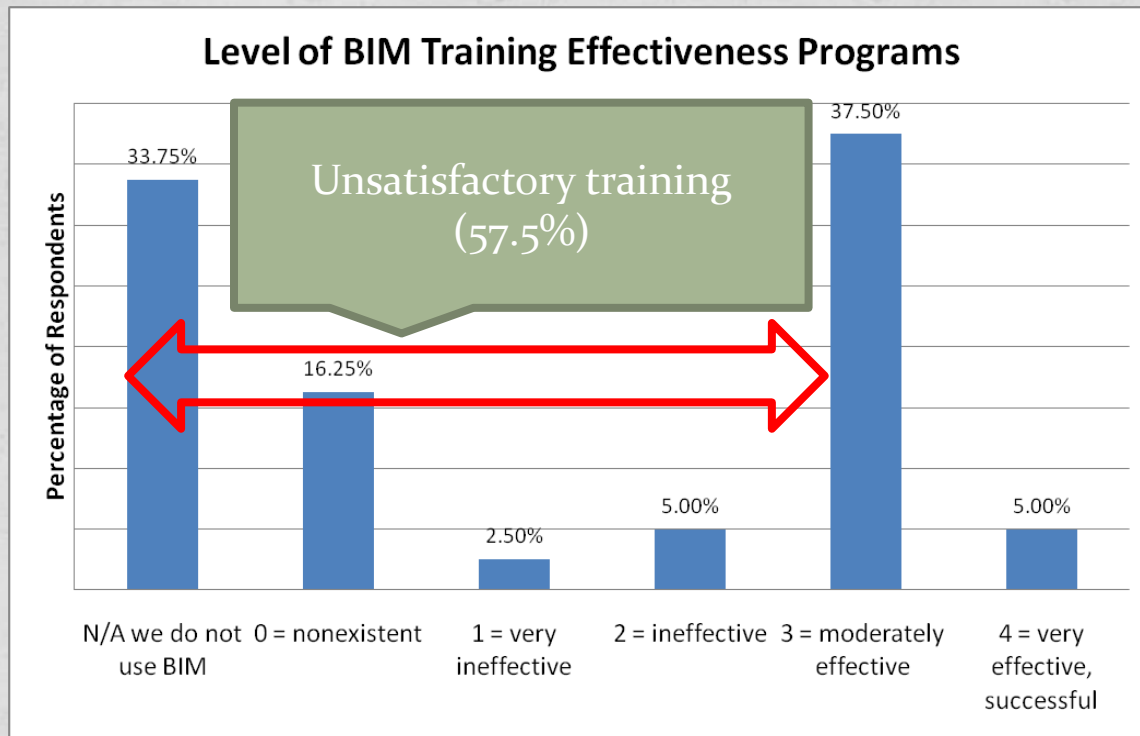


Rate the level of interest in your organization for the following:



Obstacles to implementation of BIM

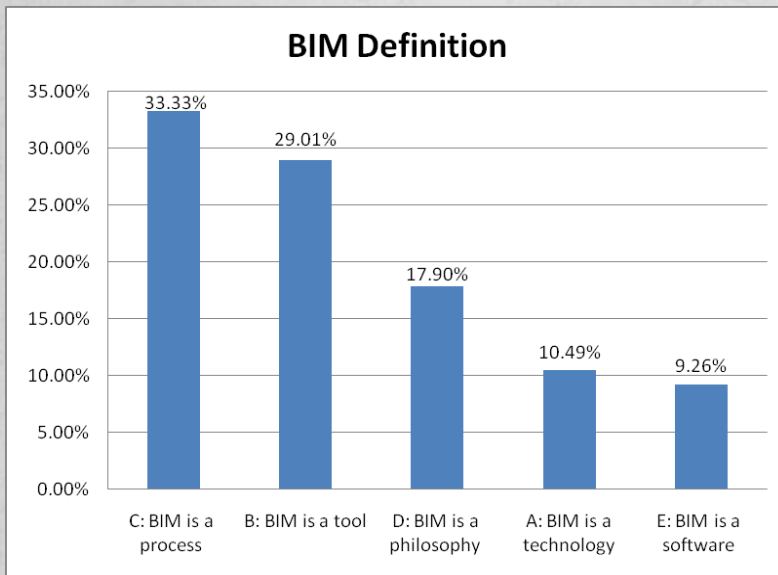
Rate the level of effectiveness of your organization's BIM training program on a scale of 0 to 4?



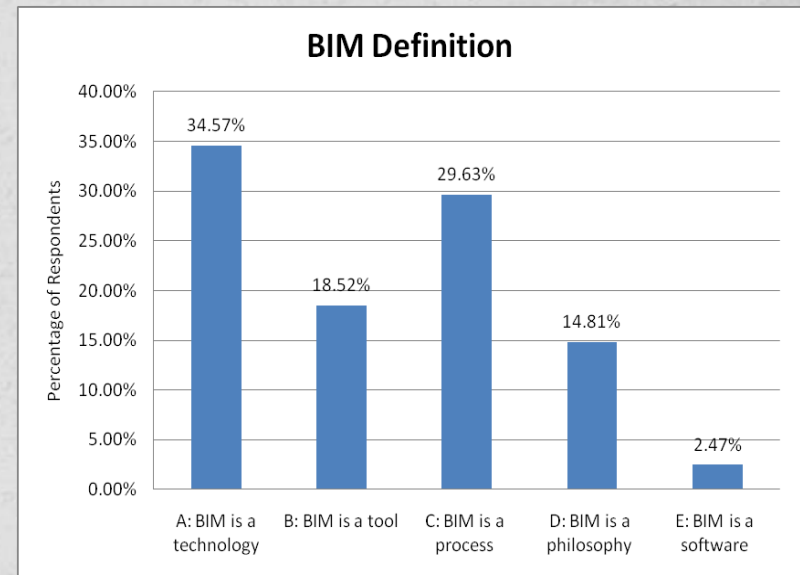
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- a technology
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- a tool
- a software
- a process



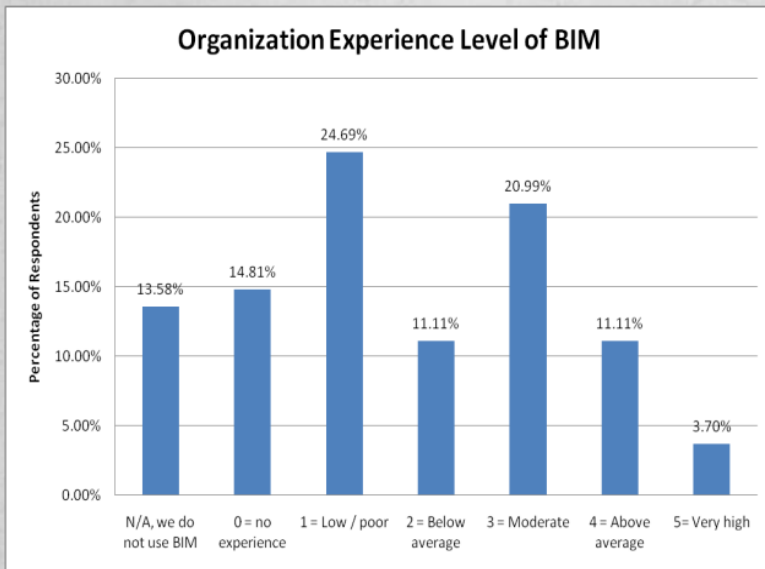
Before



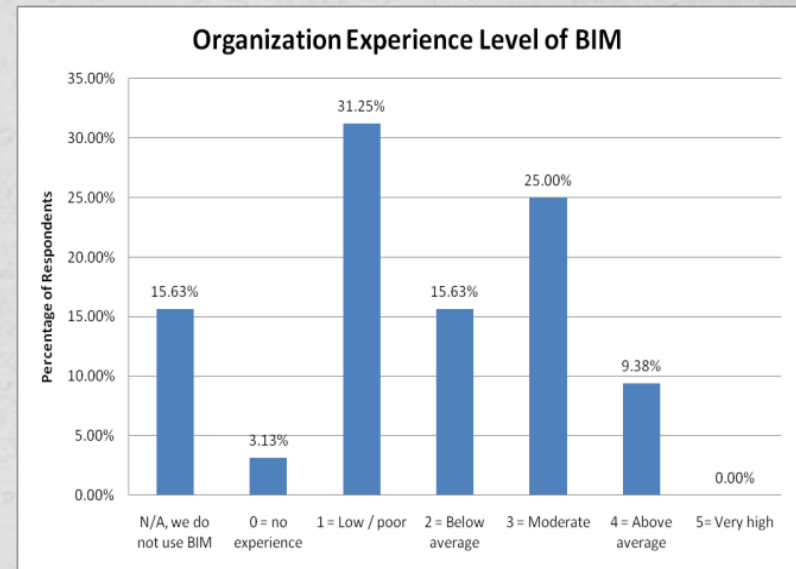
After

Organizations' experience/knowledge of BIM: before and after opinions

How would you rate your organization's experience/level of knowledge of BIM?



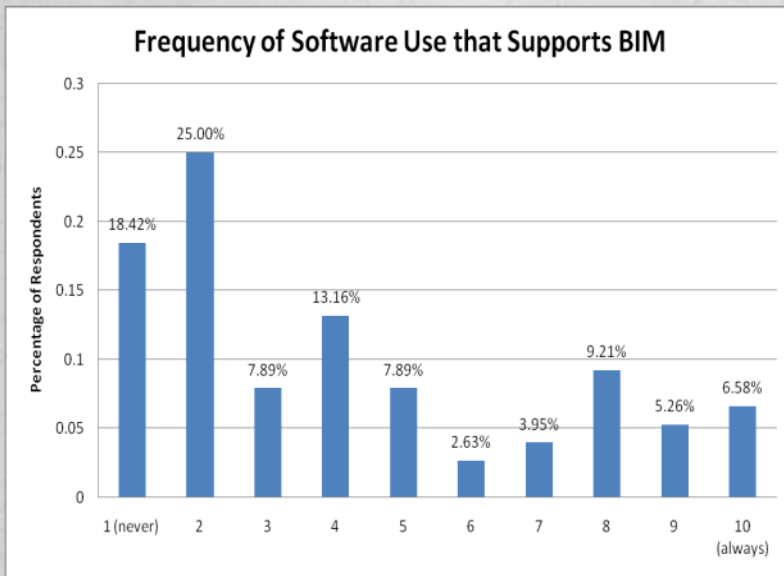
Before



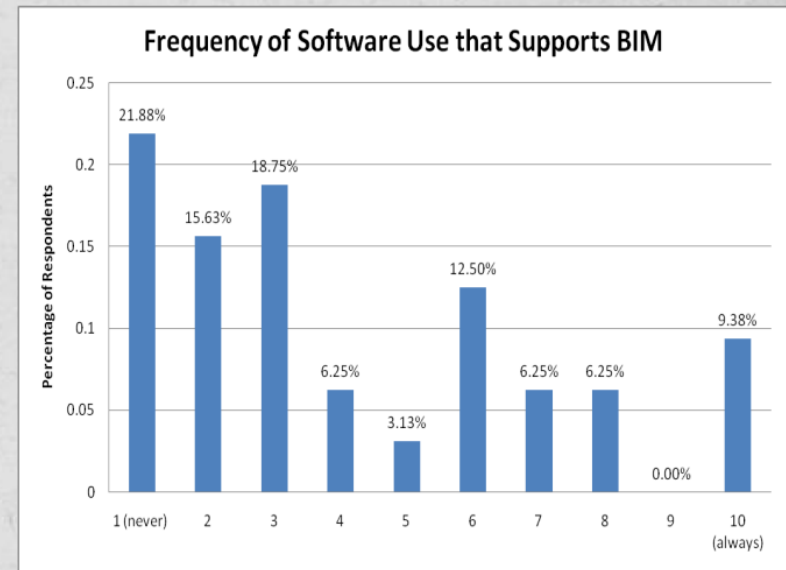
After

Knowledge of BIM: “What is BIM ?”

How often do you use software that supports BIM?



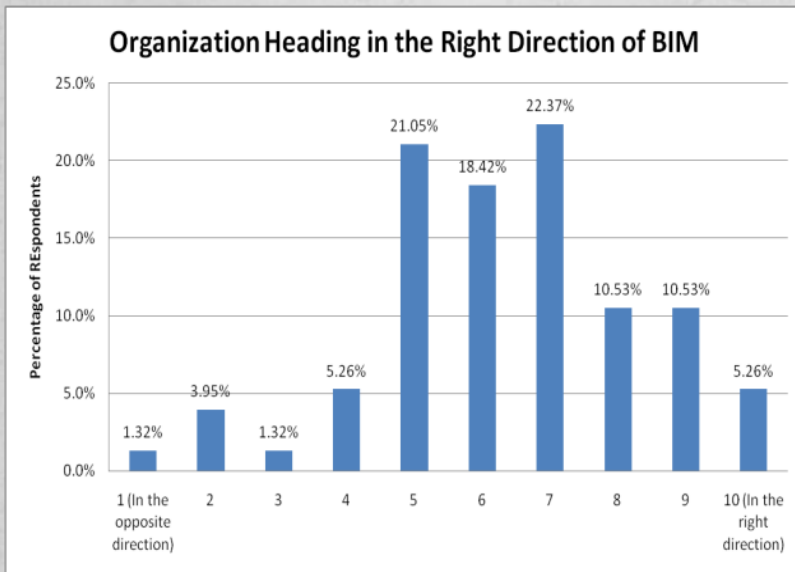
Before



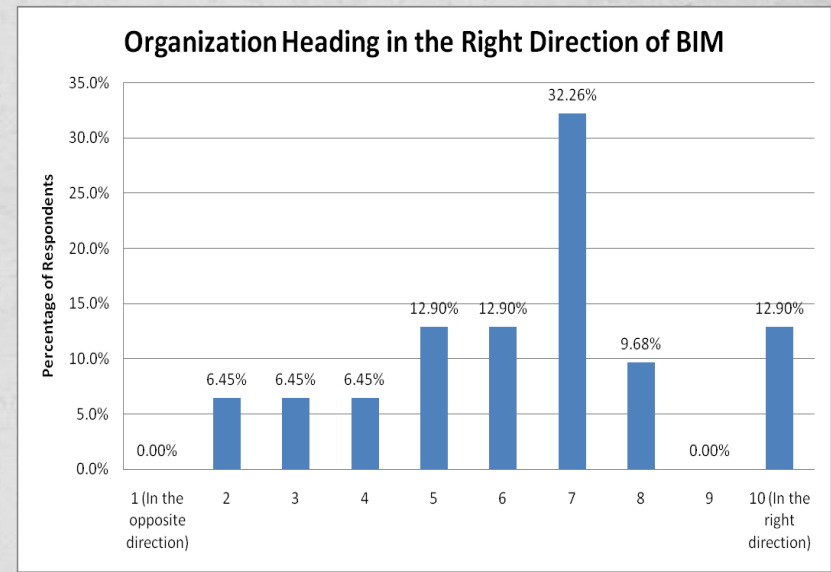
After

Knowledge of BIM: “What is BIM ?”

Is your organization heading in the right direction with BIM?



Before



After

Recommendations

- There is a lack of education on BIM technology and its relationship with **IPD**.
- It is important to establish **BIM guidelines** for Canada that can be integrated with international guidelines in the future.
- Process change within the AEC and FM industries is often unaddressed. There is still a large concentration on the manual, **document-based process** rather than the **one-model concept** of project delivery.
- The number one motivation to implement BIM technology is the steady **market demand**.