

Innovate

A Canadian Cross Country Review

*Integrated Project Delivery through
Building Information Modeling (BIM)*

1/17/2008

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Topic: BIM - Practice Impacts 1

Presenter: Caesar Ruest



Part 1

Emergent trends in BIM deployment;

a North American Specialist's perspective

- Why offices switch to BIM
- Changes to People, Process, and Equipment
- Preliminary recommendations for change



Objective -Recognize and verbalize reasons to integrate BIM

What makes Canadian offices switch?

- Buzz on the street - **Reactive, but unexplainable**
 - Peer networking
 - Competition
- Internal Staff - **Progressive, but challenging**
- Complex Building Geometry - **Progressive, but not obvious**
- Sustainable Design and LEED - **Progressive, but unknown**

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Objective -Recognize and verbalize reasons to integrate BIM

Peer networking

Firm to Firm

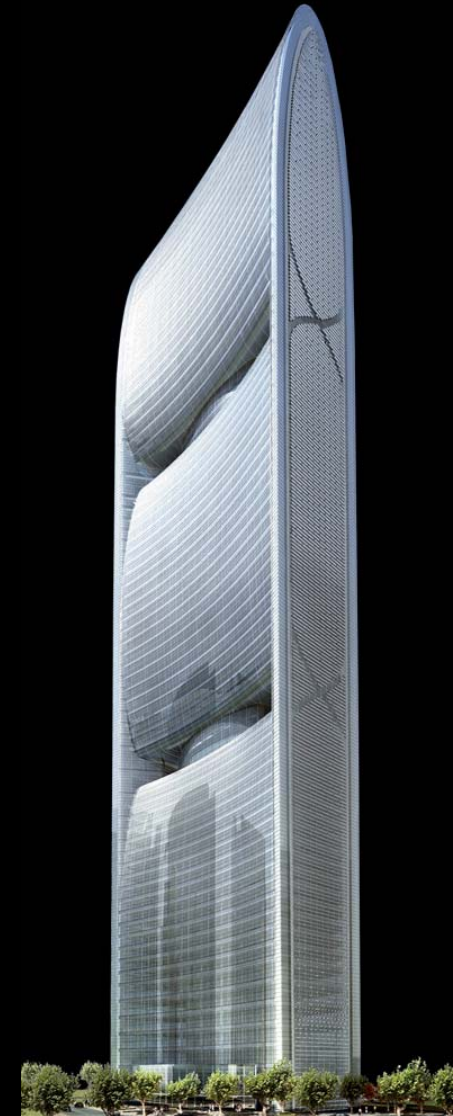
- Colleagues refer to incredible results using BIM and they would never have their staff return to line based CAD
- Do more design options with the same amount time



Objective -Recognize and verbalize reasons to integrate BIM

Competition

- Association events showcasing projects leveraging BIM
 - Visualizations
 - Calculations
 - Analysis
- Documented successful uses of BIM
 - Architectural and Engineering publications
 - Manufacturers publications
 - Owners marketing media



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Objective -Recognize and verbalize reasons to integrate BIM

Progressive members researching technology



- Associate designers leverage technology
 - Younger generation grew up with more technology
 - Project managers cringe change: RISK
- Need something more than 2D CAD
 - intro Sketchup
- Designers see a huge ROI for quick design and instant visualization
 - Design is the first area that BIM impacts



Objective -Recognize and verbalize reasons to integrate BIM

Complex building geometry



Pre / Schematic design stage

How will you determine:

- Floor area and space allocation
- Elevations and aesthetics

Consider the full design team

How will they:

- Truly understand the project scope
- Move from SD to DD and CD



Objective -Recognize and verbalize reasons to integrate BIM

Sustainable design and LEED

- Architects educating clients about Sustainable Design
 - Firm differentiator
 - Owners sales tactic
 - Important public concern
- LEED calculations leveraged directly from the BIM
 - Daylighting analysis
 - Energy consumption



Objective -Recognize and verbalize reasons to integrate BIM

Globally, why are others adopting BIM?

All the previous + ...

- GSA is a large influence in the U.S.
- Design Build and Fabrication



Objective -Recognize and verbalize reasons to integrate BIM

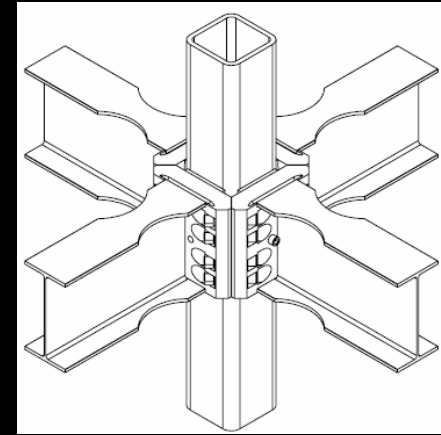
GSA is a large influence in the U.S.

- For all major projects (prospectus-level) receiving design funding in Fiscal Year 2007 and beyond, GSA requires spatial program BIMs be the minimum requirements for submission to OCA
 - Utilize BIM in early concept design
 - Data-rich interactive data models
 - Improve the decision-making process



Objective -Recognize and verbalize reasons to integrate BIM

Design Build and Fabrication



ConXtech

- Design is holistic, rather than in multiple, unrelated drawings
- BIM easily addresses Optional construction methods or materials
- Route data to the CAM (computer-aided manufacturing) system for automated parts production

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Objective -Recognize and verbalize challenges to integrate BIM into a practice

How does our past technology and processes fit into BIM?

CAD and the Design Cycles PD/SD/DD/CD

- At first, some CAD is still leveraged (*where?*)
- Modeling and rich visualization removes the need to over document in orthographic views (*plan, section and elevation for details*)
- Building knowledge is applied to the model in the SD phase instead of the DD/CD phase (*why?*)



Objective -Recognize and verbalize challenges to integrate BIM into a practice

What about our investment in people? The largest impact is on people.

- The process does change roles and responsibilities
 - Project responsibilities revolve around assembling the building
 - Teams are no longer divided along orthographic views
- Teams are generally smaller due to the software
 - Architects describe BIM as intuitive, and easy to use
 - BIM allows for a sweeping impact on design and design change
- The team needs an implementation plan
 - Milestones for success
 - Mentorship during BIM projects



Objective -Recognize and verbalize challenges to integrate BIM into a practice

What about our investment in hardware and software?

- Cycle hardware and cross-grade software
- BIM typically requires more power
 - More 3D gives the opportunity to spin the model
 - BIM is new technology built for 3D where RAM, and Video are important
- Teams only worry about a single project file
 - Compiling DWGs for project is history
 - Servers should be dedicated with large bandwidth



Objective -Recognize and verbalize challenges to integrate BIM into a practice

Recommended Hardware

See me after the show

- **Myth** : Performance on CAD systems is somewhat instant. BIM tools take more time to regenerate.
- **Truth** : Take a full project into consideration and compare a design change done in CAD vs BIM
- On larger projects, consider using gigabit network.



Objective -Recognize and verbalize challenges to integrate BIM into a practice

Changes in people and the infrastructure: Small Firms (1 to 10 people)

- Someone is usually a CAD manager, Architect, Project Manager, and bottle washer.
 - Sole proprietors or small offices should invest in training and buy time with a partner
 - The progressive Firm should start with BIM
- Start with TWO new project and milestones
 - Consider how the building will be constructed rather than worrying about the DWGs
- Know when to stop modeling



Objective -Recognize and verbalize challenges to integrate BIM into a practice

Medium Firms (10-50 people)

- Your best CAD operator is not necessarily your best choice
 - Chose a team of enthusiastic professionals that know how a building goes together
- Chose 1 Partner, 1 Project Manager, 1 Architect
 - You need buy in when there's a significant process change. These are your champions for the first project
- The safety valve is Export BIM as DWG
 - You should never feel trapped in a BIM



Objective -Recognize and verbalize challenges to integrate BIM into a practice

Large Firms (50 + people)

- Chose the best team, or the project with the longer schedule, or the fee with least risk
- This will take time to move the whole office
 - This happens one project at a time
 - Experts from a completed project should move to a new project and act as a mentor
 - Set a goal for the office consisting of XX number of BIM projects/year
- The team needs to immerse themselves
 - The BIM environment is not at all like CAD
 - Multi disciplined offices should consider a full BIM deliverable based on project selection



Objective -Recognize and verbalize challenges to integrate BIM into a practice

Large Firms (50 + people)

- IT needs to strategize who will be involved and from where
 - Wide Area Network
 - Workflows
 - Internal or Outside Consultants
- This is soooooo important!



Transitioning Your Team to BIM

Productivity Payback

Loss of billable hours (concern)
Expect 25%-50% productivity loss during initial training period
Expect to regain the same level of productivity within 3-4 months

- Recent Survey - estimated increase in productivity ranged from 10% to 100%
- > 50% saw productivity gains over 50%
- ~ 20% realized productivity gains over 100%

BIM “probably gives us a **two-to-one advantage** over other firms using traditional design software,” says Lott. “We are standardizing on a BIM tool for all new construction.”

—Forrest Lott, Founder, Lott & Barber Architects



Questions? Answers

