

UNIVERSITY OF TECHNOLOGY SYDNEY

UTS: DESIGN, ARCHITECTURE & BUILDING THINK.CHANGE.DD

BIM – Adding Value by Assisting Collaboration
Jennifer Macdonald, Lecturer in Construction Project Management

What's wrong with our industry?

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- Contributes 6% of Australian GDP yet...
- Decline in productivity over 30 years
- Poor documentation = 10 to 15% of project costs
- 60-90% of all variations due to poor design and documentation

What's wrong with our industry?

How to solve these problems? (USA)

1. "Widespread deployment and use of interoperable technology applications, also called **Building Information Modelling (BIM)**;"
2. "Improved job-site efficiency through **more effective interfacing** of people, processes, materials, equipment and information."

(NAS 2009)

How to solve these problems? (UK)

The UK Cabinet Office will **require** **fully collaborative** 3D BIM (with all project and asset information, documentation and data being electronic) as a **minimum** by 2016

How to solve these problems? (Aus)

- **Recommendation 2:** *Encourage industry-wide use of Building Information Modelling (BIM)....*
- **Recommendation 10:** *Consider Building Information Modelling (BIM) as a **key part of the Government procurement process***

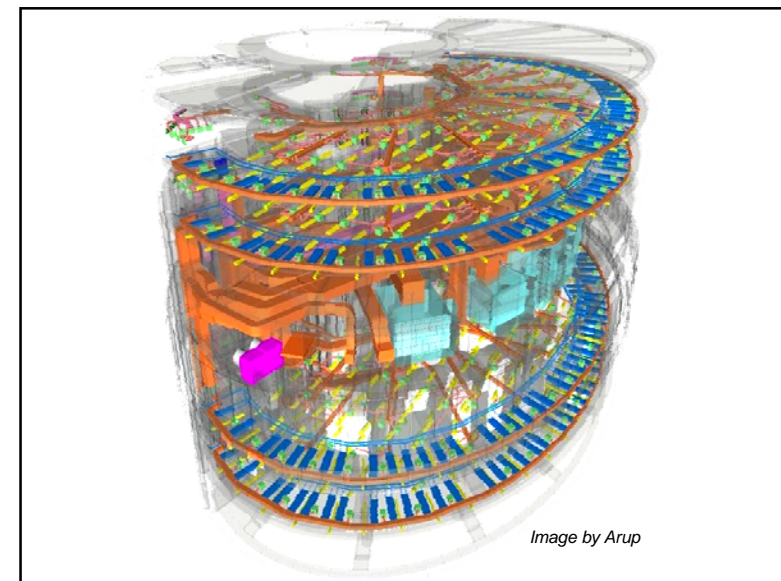
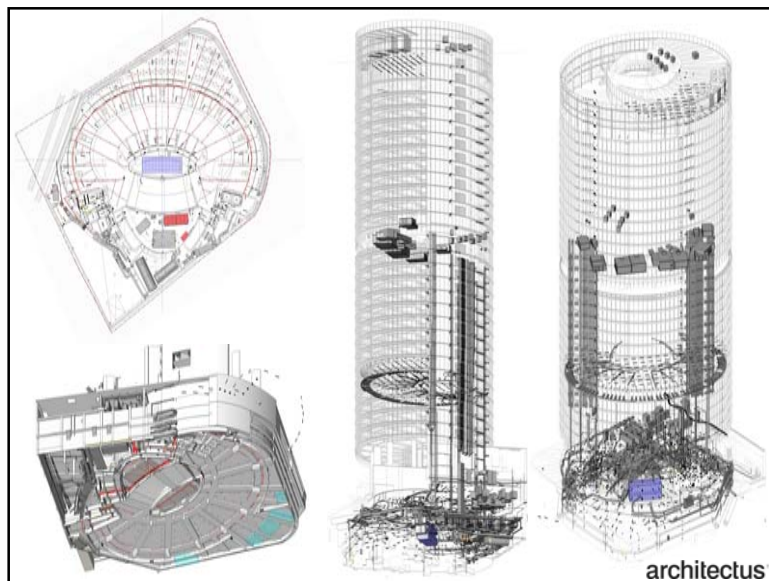
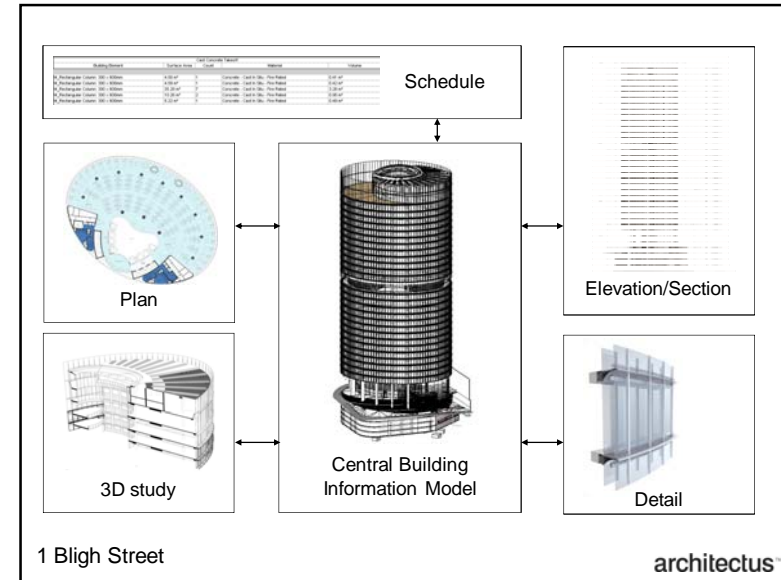
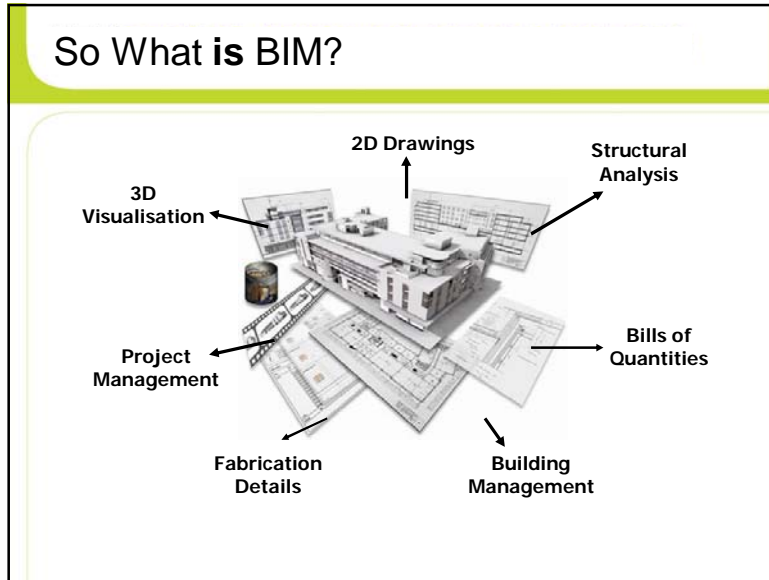
BEIIC 2010

So What is BIM?


- "...a modelling **technology** and associated **set of processes** to produce, communicate and analyse building models"
 - ✓ *Intelligent digital building components that include data describing how they behave*
 - ✓ *Coordinated data*




(Chuck Eastman,
Georgia Tech)



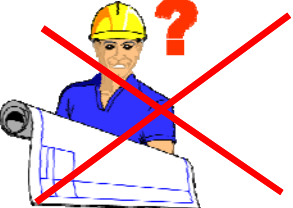
Building Information Modelling is...



Managing information to improve understanding


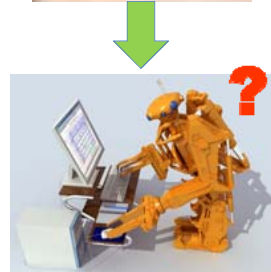


Adding value to projects



Mired in **BimWash**: BIM is **NOT**...

- ...a single building model or single database
- ...Revit (or ArchiCAD or or Tekla or Bentley...)!!
- ...just 3D
- ...complete or perfect
- ...a replacement for people

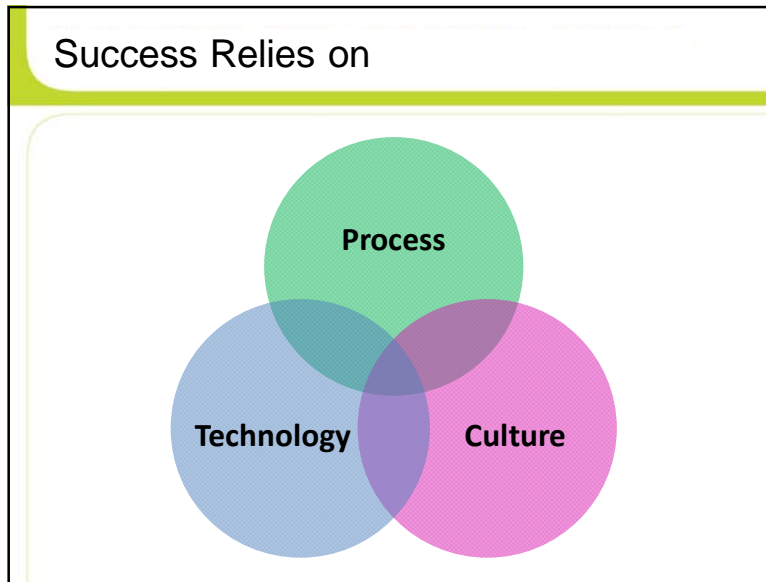
Why BIM?

Improved design reliability Reduced design risk
 Reduced waste More time to get the design right
 Enhanced coordination and fewer errors Improved decision making
 Greater productivity Higher quality of work
 Downstream uses for facilities management
 Supports sustainability Improved safety Computation of material quantities
 Improved planning, control, management of construction Enhanced communication
 Effective resource utilisation Effective coordination
 Reduction in costs Reduced number of RFIs Improved collective understanding
 Less time documenting more time designing
 Quantity takeoff Client engagement
 Improved spatial coordination Clash Detection

Barriers to successful BIMing...

BIM is not just about new software
 A **fundamental shift** in processes and ways of working is required

Communication
 Integration
 Interoperability
 Knowledge
 Certainty

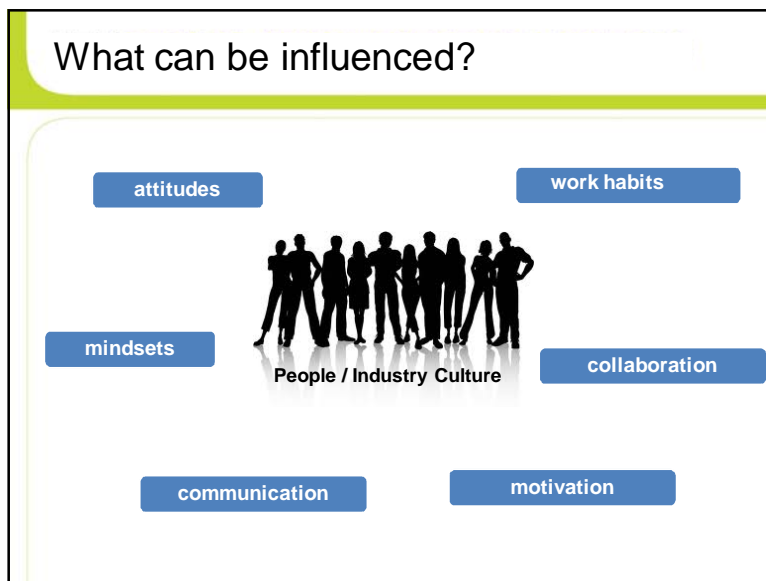


Implementing BIM....

These issues will work themselves out....

Ownership ROI Legal
Technology
 Standards Why?
 Insurance
Value

..and they are largely out of your control anyway



End of The Master Architect/Builder?

No single person can be an expert in all design disciplines anymore

An illustration of four golden stick figures standing around a large puzzle. The puzzle is composed of several interlocking pieces, with one piece missing from the center. The figures appear to be in the process of solving the puzzle.

The move towards collaborative teams



A fundamental problem....

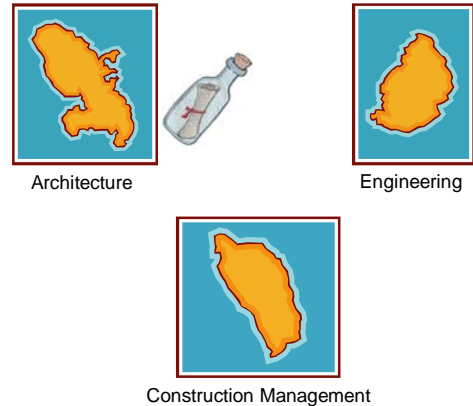
The current shortage of built environment professionals trained in BIM remains a barrier to the adoption of BIM and collaborative working practices in the industry

Top ways to improve value of BIM...

- **More internal staff with BIM skills**
- **More incoming entry-level staff with BIM skills**
- **More readily available training in BIM**

• Source: McGraw Hill Construction 2009

Implications for AEC Education?



Implications for AEC Education?

- Universities are lagging behind industry
- Schools of engineering furthest behind
- Collaboration between students of AEC disciplines is rare
- “Pretend” collaboration occurring
- “We’re not teaching students to press buttons....!”



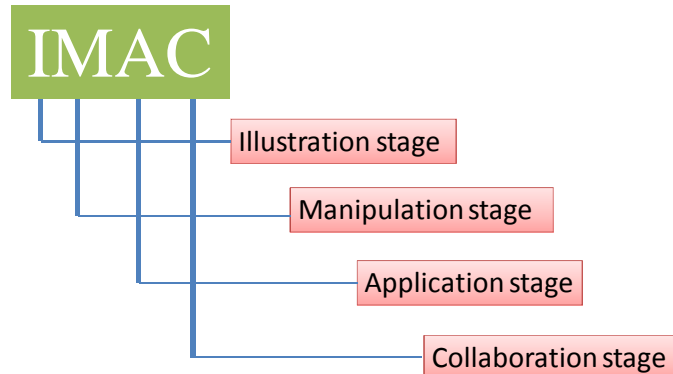
My Research Project



- Joint project
- When to introduce BIM or BIM concepts?
- How to assess BIM/Collaborative design skill development?
- How to get buy-in from all construction education disciplines?

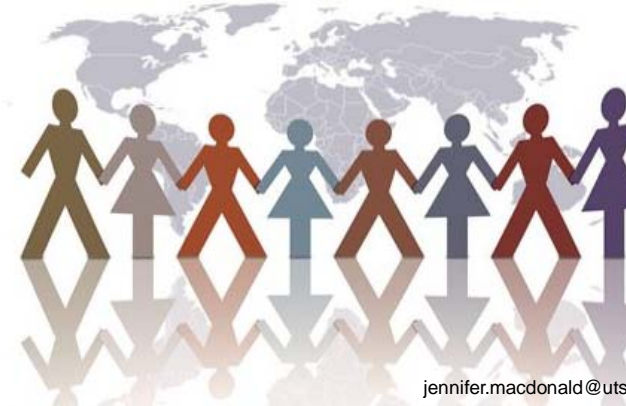


Draft Framework – in progress



The future belongs to the integrators!

“I am looking for a lot of men who have an infinite capacity to **not know** what **can't be done...**” [Henry Ford]



jennifer.macdonald@uts.edu.au

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