The impact of building information modelling (BIM) on professional roles, relationships and skills in the architecture/engineering/construction industry

Work-In-Progress

By:

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OUTLINE

- Research Motivation
- Research Questions
- Research Objectives
- Research Method
- Preliminary results
- Conclusions

Need for improvement in construction productivity

- BIM is a mechanism for improvement

BIM implementation requires change in process as well as technology

- Process change means people have to change
BIM affects all sectors in the construction cycle
What degree of individual change is required?
Current research focus:

- Uptake - surveys
- Technology - tools
Research Questions

- What new roles have developed in the industry as a result of the introduction of BIM?
  - What are the skills requirements for BIM-specialist roles?
  - What are the spheres of responsibility of the new roles?
  - How do the new BIM-specific roles relate to traditional industry roles?
  - How do organisations appoint and develop individuals in these roles?

Davies, K. (2014), The impact of building information modelling (BIM) on professional roles, relationships and skills in the architecture/engineering/construction industry. Research paper presented at the 4th New Zealand Built Environment Research Symposium (NZBERS), 14 November, Massey University, Albany campus.
How does use of BIM affect relationships and interactions between project participants?

- How is BIM used within project communication processes?
- How does BIM affect formal and informal interactions between project participants?
- What changes are evident at project and organisational levels?
Research Objectives

- Highlight best practice around roles and relationships in BIM that will help facilitate uptake and better use of the tools available:
  - guidance on recruitment and/or training for companies establishing a BIM environment
  - guidance on training and development for individuals interested in a career in a BIM-active role
  - recommendations for educators on curriculum development to fill BIM role/skill gaps

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International comparison:

NZ/Australia

Emerging BIM environment

United Kingdom

Rapid development to meet Government mandate

Europe & USA

Established BIM environments

## Research Method: Research Plan

<table>
<thead>
<tr>
<th></th>
<th>Literature review</th>
<th>Document analysis</th>
<th>Survey of BIM specialists</th>
<th>Case studies</th>
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<tbody>
<tr>
<td>Skills requirements for BIM-specialist roles</td>
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<td>Spheres of responsibility of the new roles</td>
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<td>Relationship of new BIM-specific roles to traditional industry roles</td>
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<td>Organisational approaches to appointment and development of individuals in BIM roles</td>
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<td>Use of BIM within project communication processes</td>
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<td>Effect of BIM on formal and informal interactions between project participants</td>
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<td>Changes resulting from BIM, at project and organisational levels</td>
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Preliminary Results

BIM-specialist role in New Zealand and Australia

- Very similar level of progress with BIM
- Highly interconnected job market
- Stages in BIM adoption related to spheres of influence of BIM specialist

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Preliminary Results

Strategic
- leadership
- client relationships
- communication

Technical
- negotiation
- project partner relationships
- training and support
- content development
- discipline knowledge
- model authoring
- BIM documentation
- project documentation
- project coordination

Process
- standards development
- review and quality assurance
Preliminary Results

Tensions in the BIM-specialist role

- **Practice vs project**
  Overhead and chargeable activities

- **Significant management element**
  Lack in training, especially for those with a technical background

- **Jack-of-all trades**
  “BIM specialist” is an oxymoron

- **Highly individual-dependent**
  Company BIM ability often relies on one skilled/knowledgeable person

PRELIMINARY RESULTS

Case study results – traditional BIM roles

- Very diverse levels of knowledge and advocacy within a single project team
- Hybrid environments are common
  Incomplete/Sceptical/Defensive
- Changes communication rather than practice
- Limited impact on traditional roles and interactions
  Informal rather than formal changes, depending on interest and enthusiasm of individuals

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CONCLUSIONS

- Wide variation in understanding/adoptions of BIM and BIM roles
- Change is not required in many roles
- Several tiers of BIM specialists necessary for successful adoption
- BIM skills essential for traditional project roles: “know what”, not “know how”

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OUTSTANDING WORK

- UK/Europe and US investigation in 2015
- Document analysis – 25 BIM handbooks collected to date