

BUILDING INFORMATION MODELLING AND CONSTRUCTION PROJECT TEAM INTEGRATION: A CASE OF THEORY AND PRACTICE.

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ABSTRACT

Construction project teams include multiple designers, constructors, and the client, where team selection is predominantly priced-based. The consequent supply networks are frequently fragmented and litigious. Building Information Modelling (BIM) is an electronic, integrative technology that theoretically overcomes such problems since team member compatibility becomes a critical selection criterion. This case study illustrates a gap between theory and practice, suggesting industry practitioners adopt a pragmatic approach to their expectations from BIM investments, tailored to their particular position in the supply chain and the business/ICT capabilities of their immediate trading partners. In practice this may be more feasible for peripheral participants in construction projects, who have self-contained supply chains independent of the project itself.

Keywords: e-commerce, Building Information Modeling, project teams

1. INTRODUCTION

Project team management and particularly the integration of construction project design and building phases has been a feature of human endeavour since the time of the Pharaohs. As projects become more complex, so do the number and type of participant organisations. Whilst the project team objective must necessarily be to complete the project to specification, in the required time, and to the target cost the commercial imperatives of the participant firms may be at variance with these objectives. A measure of fragmentation and conflict is therefore an inevitable outcome of such conditions.

Successive industry reviews (e.g. Egan, 1998) have suggested the desirability of adopting production management strategies that have previously proved successful in the manufacturing sector. Examples include strategic alliances between trading partners (Sakal, 2005), lean construction, and supply chain integration (Khalfan, Asad, & McDermott, 2007). Whilst there have been reported instances of success following their use they have not been widely experienced, or copied. Various explanations have been advanced for this, and the absence of information integration is one such example (Atkin, 1999).

BIM is variously a facilitative Information and Communication Technology (ICT) and an integrated business process that potentially folds the various stages of design, construction, and subsequent operation of a constructive asset into one, capturing all of the information flows in a shared database repository (Weisberg, 2001). Matters of aesthetic, engineering, financial, planning, and operational concern can all be addressed by multiple stakeholders in a single unified way. Although such technologies exist and can be shown to function successfully at a local level, it is apparent that the construction industry as a whole lacks the technological capabilities and business process maturity to fully exploit them (Brewer & Runeson, 2009). This case study illustrates both conditions, being essentially a tale of two supply chains, one of which successfully integrated BIM/ICT into its business processes, whilst the other didn't.

The integration of the specialist subcontractor's designs and products with those of the base building had the potential to be problematic, since another subcontractor responsible for fabricating the support structure had no compatible ICT competence. Nevertheless the specialist subcontractor saw fit to provide documentation beyond their contractual obligation, and access to intellectual property and personnel, commercially sensitive nature, in order to facilitate prompt project completion. They received acknowledgement that this behaviour both resolved a potentially serious problem and created a positive change in the project team culture, but received no additional remuneration.

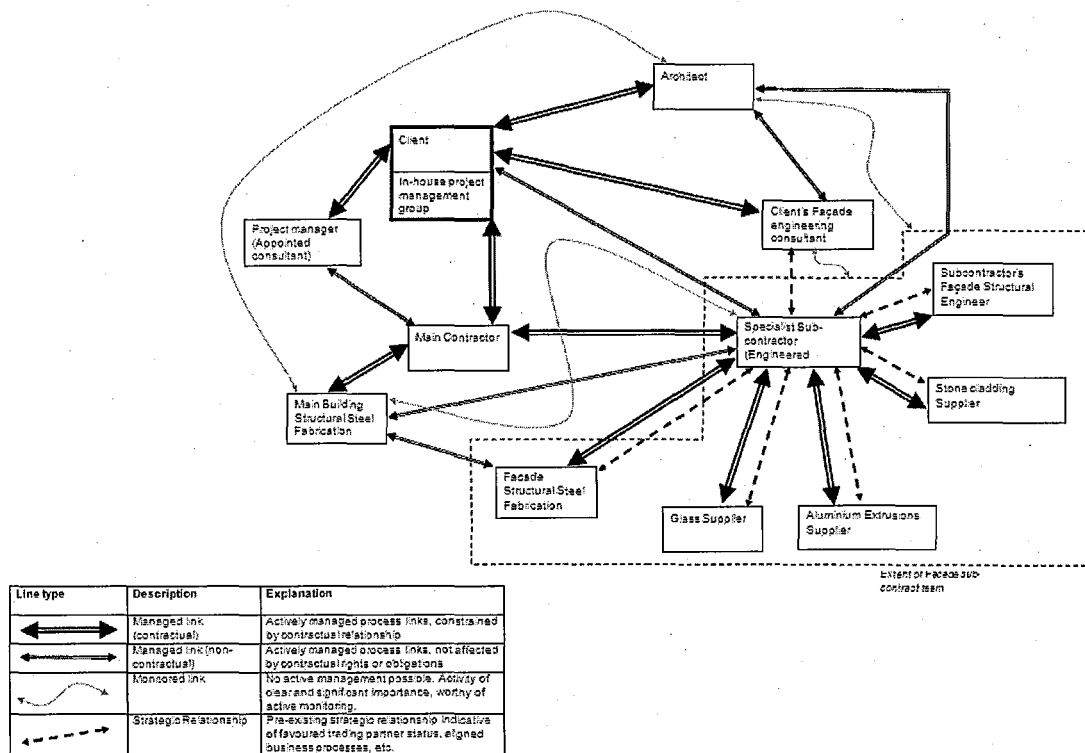


Figure 1. Project supply network.

4. DISCUSSION AND CONCLUSIONS

Building Information Modelling (BIM) technology, and particularly its collaborative use across the temporary project organisation (TPO) assembled to complete the design and construction of a construction project, is often advanced as the future of project delivery. Suggested benefits include greater design coordination reduced conflict, efficiency savings, and a valuable information stream through the operation of a building. However the success of BIM in a TPO is dependent upon the presence of participant firms that share compatible technologies, business processes, and cultures, led by people who hold attitudes and display behaviours conducive to collaboration.

Such conditions rarely pervade an entire TPO and this case was no exception. However, where conditions in the industry – rather than project – were right, a genuinely stable and collaborative set of supply network relationships had evolved, resulting in beneficial outcomes to all its stakeholders. Moreover this value generation spilled over into the project supply network itself, which was acknowledged by several of its members, and crucially the client itself. The value to the project was not confined to the inherent qualities of the engineered facade, but also extended to the operational culture of

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