

LEARNING ACROSS BUSINESS SECTORS: KNOWLEDGE SHARING BETWEEN AEROSPACE AND CONSTRUCTION

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Introduction

Published in 2004 by The University of Reading, UK; this report details the findings of a 2 year research project funded by the Engineering and Physical Sciences Research Council through the University's Innovative Manufacturing Research Centre. The report is authored by: Stuart Green, Robert Newcomb, Scott Fernie, and Stephanie Weller. It has a foreword by Sir John Gains, Group Chief Executive of Mowlem plc and Chairman of the Management Board of the Innovative Manufacturing and Construction Research Centre at Loughborough University, UK. The work was undertaken in collaboration with BAE Systems, Forticrete, INBIS, Mowlem Aquamen, Mowlem Building, NG Bailey & Co and Scott Brownrigg.

The report examines the extent to which management practice can be shared between aerospace and construction. It claims to expose the commonly held notion of "best practice" as a myth and even detrimental to performance by deflecting attention from the need to adapt continuously changing circumstances. It defines significant differences between aerospace and construction and emphasises that, whilst managerial practices may not be transferable from one sector to another, valuable learning can be derived from cross-sectoral comparisons. The authors further qualify this by explaining the importance of context through the existence of ingrained "industry recipes" that reflect and reinforce the way an industry sector is organised. Fluctuating external pressures ensure that no industrial context is ever static and the dynamics of change must underpin any attempt at knowledge sharing across sectors.

The report is easy to read with helpful margin icons and notes, used to provide extra information. Each chapter contains summary tables inserted at pertinent points intended to act as "handrails" reminding the reader of the main structural characteristics of the two industries under review. Each chapter tackles a specific topic making the report a collection of small stand-alone reviews. This enables the reader to select a chapter and learn from it without the need to read the whole document in order to find something useful. This review looks at each chapter in turn as follows:

Chapter 2 - Knowledge Sharing : Challenging Assumptions

The roots of knowledge in Lean (production and construction) are founded in systems and therefore is perhaps more comfortable with knowledge management focusing on management information systems. The report, on the other hand, falls in with the alternative school of thought that knowledge is primarily a human endeavour

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concerned with the development of intellectual capacity. This makes this report enormously useful in terms of identifying where Lean Construction can and needs to develop. Making knowledge flow should be a primary goal of Lean Thinking and, of course depends upon identifying the constraints to flow. A discussion about knowledge, its role and its management is extremely pertinent as Lean Construction starts to look at the wider issues impacting on project delivery. Part of this discussion will involve deeper investigation of the distinctions between data, information and knowledge. This chapter makes a good case for the need to understand this and tells us "Competitive advantage lies in the process of creating knowledge. Those who refuse to participate on the basis of what they know already are gambling with a rapidly diminishing asset." It is proposed that part of knowledge is its context and that knowledge is inseparable from its knower, a cautionary note for anyone attempting to learn not only from an alternative industry such as aerospace, but also from an alternative construction organisation/project or the generic proposition of "Best Practice". Failure to recognise the importance of context and knower explains in part why managerial "fads and fashions" can pass without significant impact.

Chapter 3 - Structure and Change: Contrasting Contexts

This chapter provides a fascinating insight into the structural differences between the two sectors demonstrating the fragmentation of the construction industry. Key facts include the dominance of aerospace by one company (accounting for 60% of supplier output) and that aerospace spends around 11% of the sector annual turnover on research and development. Construction, by contrast, has 30 top companies accounting for only 17% of supplier output and spends about 0.3% on R&D. This may not be surprising but hard empirical data does help us understand the context or "industry recipe" for the sector. This chapter focuses us on the issues that must be considered if any change is to be achieved. For Lean Construction it clearly demonstrates the problems faced when attempting to influence project delivery. Aerospace has become highly consolidated in the face of global competition because planes can be built anywhere. This has forced the issues of collaborative working and delivery of value. In construction, the fact that buildings are largely constructed locally prevents global competition and promotes fragmentation and localisation. The attitude and influence of government is also picked out as having shaped the development of each sector.

Chapter 4 - Supply Chain Management

This chapter recognises the use of the lean production systems from automotive as a model for supply chain management within literature aimed at both aerospace and construction, but criticises this literature for its lack of recognition of context. This is possibly justified although the Lean Construction Institute and the International Group for Lean Construction have always advocated that adaptation of lean production and lean thinking is required for successful application in construction and both have devoted much of their work to this. Construction practitioners on the other hand are perhaps seeking useable tools and techniques and do not view their role as encompassing the work required to carry out the necessary adaptation (0.03% R&D investment remember). The view construction practitioners have of themselves is an important point and this chapter unpicks some of this painting a sad picture of a cynical industry that only "talks the talk". The positive aspects of this chapter focus on a discussion of what supply chain management is and should be. For construction

this becomes a long list of barriers to improvement and integration and it is apparent that there is much to do before the industry can claim to properly manage and work with its supply chain.

Chapter 5 - Requirements management

This chapter opens with the margin note "The construction industry's obsession with cost efficiency misses the point. If you can't get the brief right you might as well pack up and go home. Building the wrong thing cost efficiently does not provide value for money for anyone". This directly illustrates one of the accepted wastes under lean thinking and that aerospace has a specific discipline of "requirements management" to capture and manage client requirement demonstrates how central this idea is. This chapter explores the theory and practice of requirements management and compares it with associated practices within construction. There is much food for thought for Lean Construction here as the chapter contains highly detailed descriptions of requirements management strategy, processes and practice. The reader is left with the feeling that construction designers are not always very imaginative tending to develop the brief based on what they want/can design rather than the other way round!

Chapter 6 - Human Resource Management

The Lean Construction community has been criticised for the impact of lean thinking on the work force so this chapter arouses intense interest. There are some interesting contracts between aerospace (moving from low skill to high skill) and construction (actively deskilling wherever possible) and one has to wonder how this may influence the growth and development of the industry. Both sectors face increasing difficulty in recruiting and retaining appropriately skilled employees and recognise the need to address this as a matter of urgency. There is also a major difference in the collectivism of staff with aerospace still highly unionised and construction being increasingly characterised by the "hollowed out" firm making wide use of individualised contracting ranging from self-employed operatives and free lance professionals with any directly employed staff negotiating personalised contracts. Lean or not, it seems that both sectors have room for improvement in HRM and the bulk of this chapter comprises theory and discussion about how this may be achieved and what a sector and an organisation should be aiming at.

Chapter 7 - Innovation

The definition of innovation is acknowledged as problematic with both sectors valuing innovation but not always clear as to the specifics of delivering it. Certainly, the highly technical aerospace industry has a high regard for radical technological innovations whilst construction commonly implements small incremental process innovations. Certainly lean thinking advocates continuous improvement as a core activity in delivering value, promoting the need to be innovative and construction has picked this up through the Egan report as a series of performance targets. These both lack much of the contextual argument this report insists upon and leads us to realise innovation is not the result of serendipity. There is considerable depth in the content of this chapter that advocates of Lean Construction and the construction industry generally should consider carefully. If, as stated in chapter 4, construction only "talks the talk" then real improvements, which by their nature require us to do things

differently and be “innovative”, will pass us by. Two aspects are identified particularly, the industry’s attitude to risk and the interference of the client in the operational activities of the supply side. Both of these aspects are heavily influenced by traditional procurement strategies and by the whole issue of trust and honesty discussed in earlier chapters.

Chapter 8 - Summary and Conclusions

Each chapter (2 -7) is briefly summarised giving the key points enabling the reader to gain a broad insight into the contribution this report can make and allowing them to home in on a specific chapter to gain more depth. This chapter then proceeds to some major conclusions resulting from the study. Firstly, the point is made that knowledge sharing has much to offer and that it is a much richer exercise than benchmarking because it includes contextual differences, this extends to the notion that best practice recipes are not universally applicable for the same reason. There are also implications for knowledge sharing within organisations as IT systems can distribute information and codified knowledge but are unlikely to contribute to the sharing of managerial knowledge and any company wishing to become a learning organisation will need to address this.

There is a major difficulty with definition with managerial practices having multiple interpretations. Indeed practices of the same name are often radically different when implemented in different sectors. The example of Supply Chain Management is cited to support this. This is partially a result of the dominant industry recipes that give rise to institutionally embedded practices. It is claimed that understanding the sectors historical development is an essential prerequisite to any change agenda. Part of this historical development is the varying models of competitiveness, with construction having taken “the low road” with competitiveness resting as much on contract trading than improving productivity. This has driven the emergence of the hollowed-out firm and seriously threatened the industry’s capacity for innovation and presented significant barriers to innovative practices. Some light is available through emerging new procurement methods. Prime contracting is cited as providing potential for collaborative working and PFI likewise offers the opportunity to stabilise the market. This will not happen though without a commitment to invest in innovation and new skills on the part of the supply side and the provision of continuity of work from the demand side. The authors believe any shift in construction will always be constrained by the structural characteristics of the sector - which may be a realistic if rather pessimistic final word.

Conclusion

In conclusion of this review, I must confess I enjoyed reading this report. Its particular strengths are the use of margin notes and the tabularised comparisons sprinkled liberally through the text. The language used is clear and logical making the document easy to read and use.

Whilst in some ways it is unsurprising in the extent of its criticism of construction, the clear definition of issues makes it a useful strategic document, pinpointing how the construction sector can start to make better use of knowledge in its management practices.

All in all, this is a must have reference source.