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A competitive future for UK construction?

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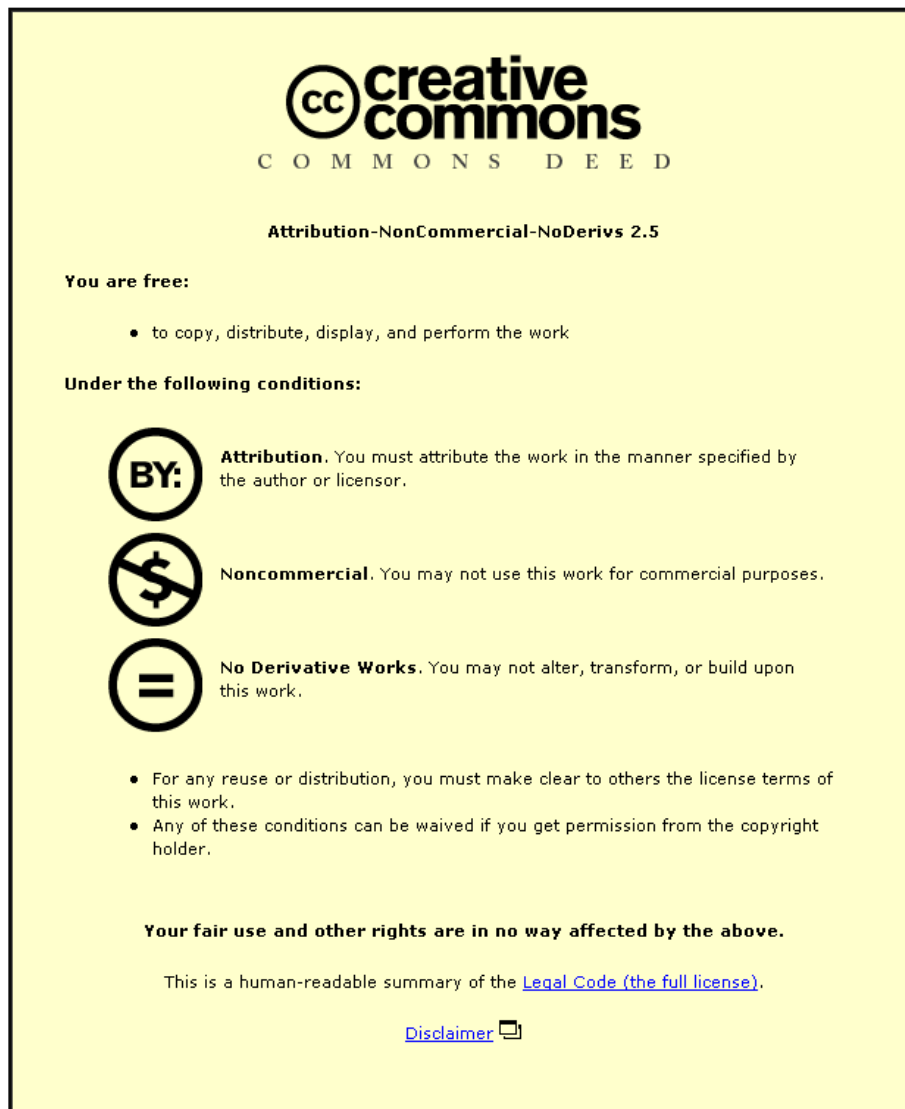
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A competitive future for UK construction?

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ABSTRACT

Recent decades have witnessed various industry-focussed government reports that have urged construction stakeholders to look further ahead by focusing on future-oriented issues such as continuous performance improvement, sustainability, training, and research and development. Evidence from a recent industry workshop of senior construction managers has shown that the majority have been involved in the formulation of long-term strategic planning and decision making, but in an informal, unstructured and ad-hoc manner using a diverse range of techniques and information. It is argued that this approach may not be sufficiently robust for companies to adequately plan ahead within the fast-moving pace of the modern construction sector. Emanating from a motivation for developing a new perspective of the current competitiveness initiatives, an ongoing three-year research project at the universities of Loughborough, Reading and Salford aims to identify and understand the challenges and opportunities confronting the UK construction sector over the next 10 to 20 years. To date, 24 industry workshops and interviews have been conducted and nearly 70 causal maps and future scenarios constructed on a broad range of issues, themes and subjects pertinent to the future of the UK construction sector.

KEYWORDS: future studies, scenario planning, competitiveness, strategic planning

INTRODUCTION

Despite the importance of the UK construction sector to the economy and numerous examples of successful high-profile projects, it has frequently been berated for both its failure to meet customer demand and for poor performance (e.g. Latham, 1994). Many people inside and outside of the industry (e.g. Egan, 1998) perceive that the industry particularly lags behind in adopting innovative new technologies, working practices and processes. Construction is considered to be ineffective at planning for the long-term future, and to lack forward thinking (DTI, 2001). Recent future-oriented reports and studies in construction have called for the industry to expand their business planning horizons by looking beyond their next projects to prepare themselves for potential future events and trends (Harty *et al*, 2007).

Existing futures studies generally look ahead or envision what the future will look like (Soetanto *et al*, 2006). These studies do not necessarily aim to predict what will happen, but try to encourage debate about the issues that will affect the future so that organisations can be better prepared. They are considered as an early warning system, a way for people and businesses to visualise the future some years (up to 10 or 20 years) from now (CIRIA, 1999). A criticism of many future studies is that they tend to start 'from scratch' as if there were no previous work within the area (Flanagan, 1999). As a result, there is little effort to build cumulatively on this body of previous work or to evaluate improvements which could be made to the future methodologies. Despite these weaknesses, existing futures studies do however recognise at least the possibility, if not the certainty, of wide-scale change in the next 10 to 20 years which could significantly alter the current contexts in which construction work is undertaken (Harty *et al*, 2006). Factors both internal to the industry (such as new materials and construction techniques) and external (such as climate change and demographic change) could introduce new problems (and opportunities) for the construction sector in the coming decades. These developments suggest that radical as well as incremental change may be both required, and/or thrust upon us. The only thing that is certain is that the future will be different.

In summary, the construction sector needs to better prepare for its own future, mainly through creating a more informed and forward-thinking environment, accumulating and capturing the knowledge of stakeholders, and stimulating creative thinking. This would require considerable change in the way in which the sector operates, characterised by the complex interplay between structural and cultural factors. Understanding this interplay will enhance its capacity for improvement through the identification of areas that could instigate real change and hence widen its visionary horizon. This leads construction people to be more innovative, proactive and imaginative, hence more able to compete locally and globally for added-value rather than cheapest price, in order to sustain the competitiveness of the UK construction sector in the long-term. A collaborative research project is ongoing aimed at developing an integrated approach to sustaining the competitive sector, which is outlined here. This paper puts forward a case for rethinking the performance improvement agenda that has been shaped by many initiatives in the past (e.g. Constructing Excellence, Movement for Innovation etc). As part of this, the current practice for the formulation of long-term planning within organisations was investigated through a survey of senior construction managers, and is presented as follows.

WORKSHOP WITH SENIOR CONSTRUCTION MANAGERS

A questionnaire survey of senior CIOB members in the UK was recently undertaken to provide information regarding the tools and techniques that they have used for planning. The aim was not to provide statistical data based on a representative sample, but to provoke further thought and discussion and to enhance the knowledge of current practice in strategic planning. The questionnaires were distributed during a CIOB regional annual conference and forty questionnaires were completed and returned.

The majority of the respondents were experienced construction professionals who had been in the industry for a significant amount of time (an average of 24 years). Most (85%) declared their involvement in the formulation of long-term strategic planning and decision making. The length of the future plans that they had been involved in varied, but more than half (56%) had a corporate plan for the next 5 years. Only 18% and 12% indicated that their plans were for 10 and 3 years respectively and much smaller proportions planned for 1, 2 or 20 years. This concurs with Brightman *et al.*'s (1999) assertion (as well as anecdotal evidence) that planning horizons are generally limited to between 3 and 5 years. Longer-term plans are often sensitive to changes due to social, political, economical and technological development. The majority (70%) indicated that they have personally experienced events which have had an adverse effect on their corporate planning. Most reasons cited were events over which they have no or little control, such as market slumps or recession, and changes in government policies. Current issues such as skills shortage, energy prices and climate change were also cited, indicating their awareness of the possible impacts that these might have now and in the future.

The respondents were also asked about the techniques that they had used. They were provided with multiple choices of common tools/ techniques and information. Most respondents used a combination of several techniques, rather than a single technique (see Figure 1). 68% used SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis and 58% competitor analysis (i.e. analysing the behaviour and development of similar competitors). Gap and PESTEL (Political, Economical, Social, Technological, Environmental and Legal) analyses were used by 32% and 20% respectively. Interestingly, 15% of respondents who stated they were involved in strategic planning activity did not use any techniques at all. A small number of 'other' methods were declared, including 'mind-mapping', 'what-if scenarios' and 'blue-sky thinking/ brainstorming'.

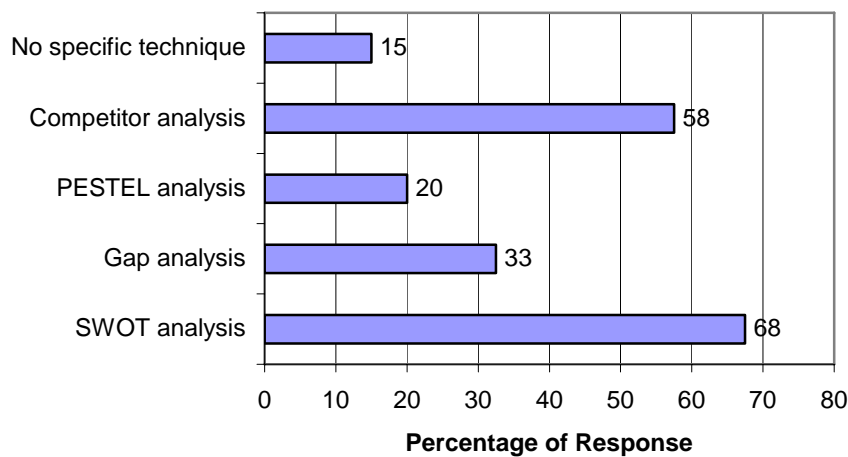


Figure 1 Techniques for strategic planning as adopted by respondents

Delegates were also asked to indicate the information that they thought was required for developing their strategic planning, and rate the effectiveness of the information in terms of its ability to help them make the right decisions. A Likert scale of 1 to 4, where 1 indicates 'poor' and 4 'excellent' was used for this purpose. The average responses, in order of effectiveness, were 'intuition and experience' (2.7), 'personal contacts' (2.6), 'forecasts from internal/ external sources' (2.6), 'statistics (of past data)' (2.5), and 'newspapers and magazines' (2.1) (see Figure 2). Other sources of information that respondents stated they used included 'external markets & competitors', understanding the competitor/ market mix' and 'government papers'.

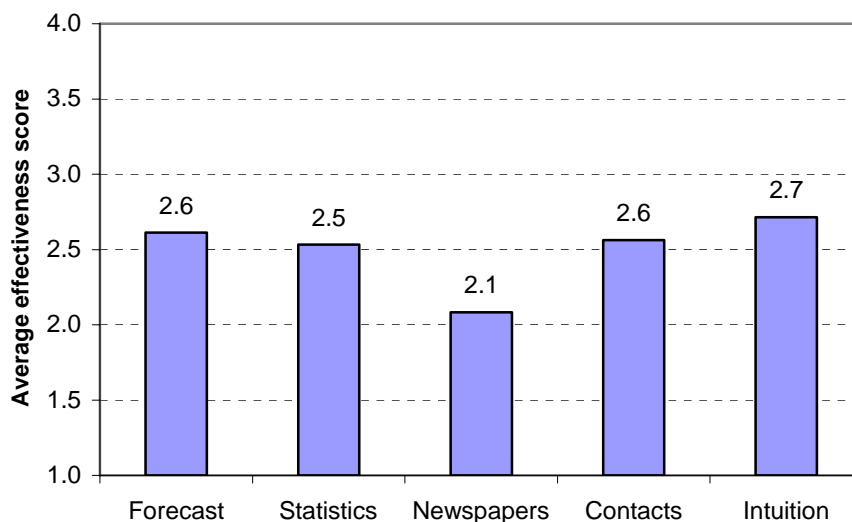


Figure 2 Effectiveness of information for supporting strategic planning

The spread of responses showed that the majority of respondents thought that most of these methods were 'moderate' or 'good', with very few rating any of them either 'poor' or 'excellent'. The results highlighted a reliance on intuition and experience as well as personal contacts in the formulation of strategic plans. It is interesting to note the reliance on these 'softer' sources of information as well as 'harder' information such as forecasts and statistics. These findings indicate a high degree of personal subjectivity of senior management during the formulation of corporate strategic planning. A more formal strategic planning technique which is able to elicit

and unify aspirations from staff at various levels might assist organisational competitiveness through helping to capture the relatively untapped potential of its workforce. This approach could empower the workforce and help develop a sense of collective ownership for the decisions made, hence enabling full worker support, commitment, creativity and job satisfaction. This approach is sometimes used by companies to identify 'small steps' or 'first wins', that with an aggregated effect can be powerful enough to 'move their particular division within the company closer to its vision' (Hiemstra, 2006). Furthermore, a greater understanding of the various possibilities that may lay ahead in the next 10 to 20 years should be helpful in assessing and making strategic decisions within construction organisations. The information required to enhance understanding about the future should not be just the 'most important drivers', but pathways (i.e. scenarios comprising events, drivers, goals and barriers) through which desirable futures can be sought and undesired ones mitigated. The research on which this paper is based attempts to strengthen the development of these future scenarios through reconnecting with understanding and learning from the past.

'BIG IDEAS' PROJECT AND RESEARCH METHODOLOGY

'Sustained competitiveness in the UK construction sector: a fresh perspective', or the *'Big Ideas'* for short, is a UK government-sponsored collaborative research project between the Innovative Manufacturing Research Centres at the universities of Loughborough, Reading and Salford. The objective of this 3-year project is to engage with industry to identify and understand the challenges (and opportunities) facing the UK construction sector over the next 10 to 20 years. The project is founded on the contention that research in support of the competitiveness of the UK construction sector needs a fresh impetus. That is, previous efforts have been sporadic, piecemeal and have failed to take account of the structural and cultural fabric in which the construction sector operates. This calls for a need to reconnect the current research agenda with the present reality of the construction sector. The research embraces four inter-connected work packages (WPs) as follows:

- WP1: Identifying key issues, factors and events which could shape the construction industry over the next 10 to 20 years and establishing a range of possible future scenarios based upon groupings of their interdependencies
- WP2: Grounding the project in a thorough investigation of the current structural and cultural configurations which shape the manner in which strategic competitiveness is enacted in practice within construction
- WP3: Creating and using an interactive dynamic IT modelling tool to explore and simulate a number of these future issues and scenarios
- WP4: Developing appropriate strategies, policies and guidance at both industry and firm levels to help organisations prepare for the future

Where are we going? (WP1)

The initial stages of this WP involved reviewing the many construction futures reports which had been published in the last 8 years, the majority from the UK but also some international work (reported in Harty *et al.*, 2007). More than 300 issues were identified from this literature and content analysis was used to group these in high-level 'clusters' of related issues (Soetanto *et al.*, 2006). These issues were used as a basis for identifying emerging themes in the data collection exercise, which was aimed to capture people's perceptions and interpretations of future events in industry workshops, in the form of causal maps (Eden and Ackermann, 2001), a form of cognitive maps. Causal maps, constructed by two to four individuals in a group setting, exhibit 'cause and effect' relationships between events (and also concepts, factors, barriers and enablers). From this, emerging future scenarios for a particular theme can be identified (see Figure 3). These workshops, lasting from between 1½ to 3 hours, have yielded detailed maps of issues, drivers and barriers, together with an associated recorded verbal narrative of the maps (Harty *et al.*, 2006b). To date, 24 workshops and interviews have been conducted, generating nearly 70 causal map future scenarios. Themes covered include social (e.g. aging population, demographics), economical (e.g. globalisation, whole life costing), environmental (e.g. climate change, sustainability) and technological (e.g. automation, materials). The majority of the workshops have been organised jointly with construction institutions and their members, such as the Institution of Civil Engineers (ICE), Constructing Excellence (CE), Health and Safety Executive (HSE), Chartered Institute of Building (CIOB),

European Construction Institute (ECI), Construction Industry Council (CIC) and the Department of Trade and Industry (DTI).

The workshop data has been converted into pictorial maps (using the Decision Explorer™ software) and an associated textual explanation of the scenarios. This enabled further analysis and validation of the data (in terms of communication, reflection and feedback from other practitioners).

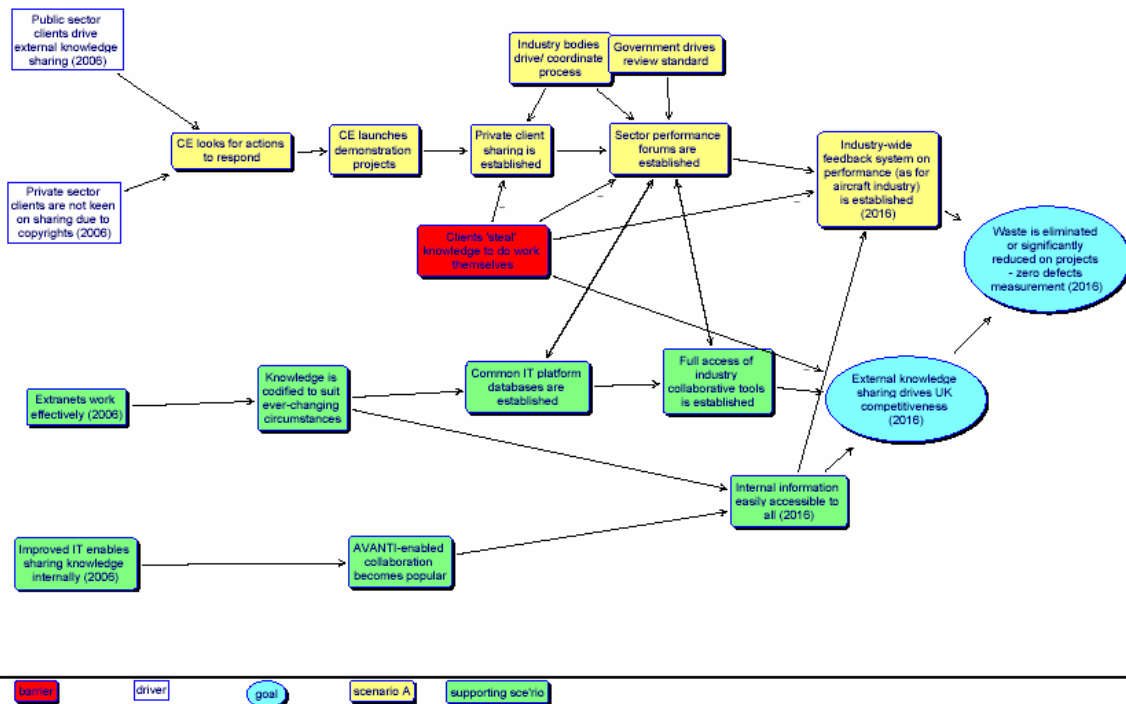


Figure 3 Example of a causal map (Theme: 'Increasing knowledge management and information sharing')

The purpose of these scenarios is not to predict which is going to happen, but to generate open discussion and to stimulate learning amongst practitioners and policy makers so that plans can be put in place to ensure that the industry progresses towards more desirable outcomes, whilst simultaneously being aware of the risks associated with the less-desirable scenarios (but it should be remembered that one person's desirable outcome can often be undesirable for another (or can instigate undesirable outcomes for another). However, successful strategies may have unintended consequences for businesses and it is a further objective of these approaches to make these more transparent.

As part of our industry engagement, the project is benefiting from close linkages with a number of other construction futures research projects and teams, in particular:

- DIUS Foresight SEMBE (Sustainable Energy Management in the Built Environment)¹
- ECI Industry Futures Task Force²
- HSE (Health & Safety Executive) Horizon Scanning Unit³
- BRE/Defra/AEA Technology: Developing a Strategic Approach to Construction Waste- 20 Year Strategy (BRE, 2006)

Where have we come from? (WP2)

¹ www.foresight.gov.uk/Energy/Energy.html

² www.eci-online.org

³ www.hse.gov.uk/horizons/

The research team at the University of Reading have engaged with several UK regional contracting firms to understand how these firms operate within a constantly changing construction environment. The research has focussed upon the type of work each firm has undertaken, the activity of the managers within each firm and the firm's historical development. It draws upon the broader strategic management literature of strategy-as-practice (Johnson *et al.*, 2003) and its cousin dynamic capabilities (Teece *et al.*, 1997). Semi-structured interviews have been carried out with senior managers and directors within the case study firms. What has been evident is that each firm has a unique story, whereby competitiveness has been enacted very differently depending upon context. Generally, contracting firms currently operating, and particularly those with a longer history still operating are extremely good at adapting to changing structural issues within the industry. In addition, these firms have the capability to reconfigure the manner in which they work, often very quickly, although usually opportunistically rather than strategically (Green *et al.*, 2007).

How are things connected? (WP3)

Findings from WP1 and WP2 are being used by the University of Salford for the development of grounded models of sustained competitiveness of the UK construction sector, predominately using system dynamics (SD) methodology. The main concept of SD is to understand how all the objects in a system interact with one another. A system can be anything from a steam engine, a company, an industry or a cricket team. SD methodology is an approach to understanding the behaviour of complex systems over time which can deal with internal feedback loops and time delays that affect the behaviour of the entire system (System Dynamics Society, 2007). It is a computer-modelling simulation technique that enables the behaviour of complex real systems to be simulated and studied over time (Sherwood, 2002). The models allow the feedback of information, both quantitative and qualitative, at each time step, to show the inter-relationship of activities and factors within a given system.

By analysing this data, a high-level map of a firm's resources and factors that impact upon them was constructed (Quigley *et al.*, 2006). This map was converted into a series of models, from a variety of theoretical perspectives, which convert a firm's characteristics into a competitive index (CI). This metric can then be used to help indicate which firms in the model are most competitive, and correspondingly win more of the available contracts. Ongoing work in WP3 involves modelling the different areas of the UK construction sector (e.g. social housing) and how these are expected to change in the future by incorporating selected future scenarios produced by WP1 and existing industry structures from WP2. This work will enable the models to give insights into behaviour that firms can adopt (by performing a 'what-if' analysis) that may help in them being more competitive. This work will then be expanded to look at how the UK construction industry as a whole can be competitive in a changing future environment.

How do we get to where we want to be? (WP4)

The final WP is using soft systems methodology (SSM) and SD modelling as a participatory means of identifying and investigating the desirable and feasible changes arising from the first 3 WPs. SSM is best understood as a process of enquiry; its use in conjunction with SD modelling combines an interpretive standpoint, accepting of multiple perspectives, with recognition of dynamic causal interconnectivity. The purpose of this guiding framework is to help link the investigative dynamic strategies devised in WP3 with the contextual reality of the sector as explored in WP2 and the future scenarios identified in WP1. The combination of SD and SSM is powerful because it counters the main criticisms when the two methodologies are used in isolation (Checkland, 2001).

Systems models representing existing structures and practices will be derived from semi-structured interviews and compared to the SD models in industry workshops. The differences between the models and industry opinions will provide the structure and substance for an organised debate. Such a process is important when discussing strategies for moving the industry from where it is now to a desired future state. The debate will also accommodate opinions from different interest groups, which is vital in a sector long characterised by conflicting agendas and a myriad of representative bodies.

These models, interviews and opinions will consequently form the data from which the final WP and project deliverables will be developed. These include a 10-year research agenda for the academic community, EPSRC and IMRCs, strategic guidance for industry and individual companies for the implementation of innovation-based competitiveness, and an improved capacity for strategic planning aimed at individual companies within the sector.

DELIVERING THE 'BIG IDEAS'

The work for the final work package (WP4) is now progressing, with the main aim being to improve the capabilities of construction firms for thinking about the future and hence their strategic planning. This is an area considered to be traditionally weak within the sector, as evidenced from the survey outlined in this paper and also borne out by the analysis of the industry engagement and case studies conducted within the project.

One of the main objectives of the project is to effectively utilise the outputs and insights from the research within the industry itself. WP1 is a diverse range of causal maps and scenarios of important future issues, factors and events, including their interconnectivities. These can help identify potential challenges, and also to give some appreciation of the interconnectivities and potential 'knock-on' effects of dealing with specific issues. The further development of a range of scenarios incorporating a number of interconnected issues and events will also be useful when working with industry to prepare them for different potential futures.

The project historical case studies and the conceptual positioning of them will provide the basis from which to develop the planning tools and techniques themselves. They will also help reinforce and support the strategic plans of industry collaborators resulting from them. By using SD simulations alongside the SSM modelling, it will also overcome the criticism of using either in isolation (in term of being either too hard and abstracted, or too soft and descriptive).

Using the information emerging from the project guidance for investigating the future and strategic planning will be developed, and this will be piloted with both individual and related clusters of construction firms. In addition, areas where academic research can support and further develop this capacity over the next ten years will also be identified. In addition to the dissemination of industry guidance and documentation, there will be a major conference at the end of the project to which leading researchers, industrialists and policy makers will be invited.

CONCLUSIONS

During our data collection and numerous workshops and interviews with senior industry figures it was clear that there was considerable interest and concern regarding the future of the construction industry and a general sentiment that the pace of change was increasing. On the other hand, there seems to be a lack of clarity regarding the best way to utilise information to better prepare for the future, as reflected by companies' use (or otherwise) of relatively simple tools and techniques to help plan their strategic futures (with the majority of managers relying on intuition and personal contacts, or SWOT and PESTEL analyses at best). This suggests that companies have not realised the potential benefits of a participative and creative learning environment for imagining possible futures. The Big Ideas project aims to address these problems and the lack of understanding and help the construction industry in the UK to look to the future equipped with the right information, tools and techniques for it to remain competitive and profitable for many years to come.

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