

FUTURE SCENARIOS FOR THE EUROPEAN CONSTRUCTION INDUSTRY

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The future is by its very nature uncertain and unknown, and only by discussion and debate regarding how the future may develop can we adequately prepare for what may lie ahead. A collaborative scenario development process was developed with the European Construction Institute (ECI) Industry Futures Task Force. This involved investigating and debating the range of issues and factors that might impact upon the European construction industry in the next couple of decades, which resulted in the development of four future scenarios for the European construction industry and five key characteristics for ECI's preferred future. From this the ECI identified a set of actions for its member organisations. Amongst these were the formation of two new Task Forces on People and Collaboration - a direct consequence of the work presented here.

Keywords: competitiveness, construction planning, corporate strategy, energy, future studies.

INTRODUCTION

Over the last few years there has been considerable change in the industrial climate in Western Europe and beyond, which has dramatically affected the way manufacturing and infrastructure assets are provided and maintained. There is little sign of this change coming to an end. Indeed, the challenges currently faced by the industry are increasing. The global financial crisis, foreign competition and migrant workers, significant shortages of resources and key skills have, together with a declining indigenous supply base, have led to a switch from a buyer's to a seller's market. Other factors such as volatile energy costs, raw material shortages and increasing concern about climate change together with increasing regulation and bureaucracy continue to reshape the environment in which the industry operates. In response to this the European Construction Institute (ECI) established an Industry Futures Task Force with a remit to investigate issues of concern for members and to recommend potential actions for today in order to help mitigate future problems.

The ECI is a pan-European learning and improvement membership network covering the entire project cycle for engineering and construction, with a mission to "develop and maintain a sustainable, performance-based culture across the industry" (www.eci-online.org). Established in 1990, ECI develops and disseminates good practice. Member companies and their experienced professionals come together to share knowledge of best practice to improve their competitiveness and support collaborative

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innovation. Over 60 organisations from the private and public sectors representing the whole spectrum of the construction industry across Europe are now members.

BACKGROUND

Construction organisations have traditionally been found to be ineffective at planning for the long-term future (i.e. 10 to 20 years) and generally lack any significant forward thinking. Several high-profile reports analysing the sector's performance (e.g. Egan, 1998 and DTI, 2001) have called for organisations within construction to look beyond their next project and to prepare themselves more effectively for potential future events. There seems to be little evidence however, of any formal processes in the formulation of long-term strategies in the construction sector (Brightman *et al.*, 1999, Edum-Fotwe, 1995, and Betts and Ofori, 1992). Where studies do exist, they are commonly on specific technologies such as offsite (Goodier and Gibb, 2007), rather than on specific organisations or the sector as a whole. Although strategic planning practices in construction organisations have previously been studied (Brightman *et al.*, 1999, Betts and Ofori, 1992, and Langford and Male, 2001), this work is sometimes limited by the tools and techniques used by construction organisations, the data and information that informs their decision making, and the external factors taken into account (Soetanto *et al.*, 2007).

Enhancing the ability to foresee potential alternative futures, and to prepare for them, is critical if companies are to plan and adapt to future trends and events that may lie ahead. Scenario planning is one potential technique used to generate possible, probable and preferred longer-term futures for organisations, thus helping them to plan ahead effectively (Hiemstra, 2006, Ringland, 1998 and Schwartz, 1991). A scenario development approach was therefore chosen to enable the ECI to investigate future issues of concern, and is the focus of the work presented here.

FUTURE SCENARIOS

A scenario is a type of storyline comprising a range of interconnected and uncertain future events and their potential consequences. They can be applied to decision making activities in which some factors are uncertain or poorly defined; hence scenario planning techniques' ability to deal with 'wicked' (as opposed to 'tame') problems. Their purpose is not to predict events or the most likely scenario, but to develop several plausible stories of how the future may develop, and then to explore possible 'discontinuities' and 'surprises' (Hiemstra, 2006).

Scenarios can also provide a framework for the development and evaluation of corporate strategies, in the form of 'wind-tunnelling' alternative plans. Scenario planning can extend participant's views of the future through debating possibilities, thus providing a test-bed for strategic plans, allowing them to navigate their future and to choose an appropriate direction. This can help enhance a company's organisational capacity for long-term planning, together with managers' decision-making capabilities (Schwartz, 1991). Scenario planning is a dynamic, ongoing process. Van der Heijden (1996) highlighted that the focus should be on an ongoing "strategic conversation", incorporating both a formal and informal exchange of views through which the strategic understanding develops, and actions result.

The first scenario planning techniques were developed at the RAND Corporation by Hermann Kahn in 1950 and were later used and developed further by Pierre Wack at Royal Dutch/Shell in the 1970s, becoming famous as a futuring tool when Shell was able to successfully cope with the oil crisis in 1973, thus becoming one of the world

leaders in the field (Ringland, 1998). Shell still undertakes a considerable amount of scenario work (www.shell.com/scenarios/).

METHODOLOGY

This work was conducted by the Big Ideas research team at Loughborough University (www.thebigideas.org.uk) for the ECI Industry Futures Task Force. The Big Ideas, or ‘Sustained competitiveness in the UK construction sector: a fresh perspective’, to give it its full title, is a UK government-sponsored collaborative research project between the Innovative Manufacturing Research Centres at the universities of Loughborough, Reading and Salford (Goodier *et al.*, 2007a and Goodier *et al.*, 2007b). The project ran from 2005 to 2009, and one of its primary objectives was 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 methodology was based upon causal mapping and future scenarios techniques, with participants brainstorming issues, factors and outcomes regarding the future, and using this information to construct a map of interconnected nodes and causal links, and hence a series of pathways (or scenarios) to the future (Goodier *et al.*, 2009). A detailed description of the step-by-step process is described below.

Drafting of Task Force remit (Workshop 1)

The ECI Industry Futures Task Force first met on 19th April 2007 to discuss how ECI should proceed, and a draft remit for the Task Force was presented:

- to work with other organisations to understand, within limits, where the European construction industry will be in 20 years time
- to select the 3-5 key issues which will benefit ECI current and immediate future members most fully
- to initiate, perform, collate and communicate programmes to support members in evolving towards that end successfully

A further 5 workshops were then held over the next 12 months with ECI member organisations in order to investigate this draft remit.

Issue identification and clustering (Workshop 2)

This workshop explored some of the issues, factors and outcomes affecting the future of the industry and hence ECI members, based upon a method developed by Loughborough University (Harty *et al.*, 2006 and Goodier *et al.*, 2009).

Participants first brainstormed the key issues, factors and outcomes which they thought would impact upon ECI member companies in the next 10 to 20 years. More than 200 were identified and then debated and grouped by the participants under 5 high-level categories of people, planet, built environment, work and governance. Participants were then added or discarded additional pre-prepared issues and factors. These were taken from the Big Ideas project (extracted from 15 recent construction futures reports (Harty *et al.*, 2007)); the minutes of the 1st ECI Industry Futures Task Force workshop; and the slides of a recent ECI presentation on the future of the organisation. All the issues, factors and themes were then classified, where appropriate as an internal (driver) or external (force) to ECI member companies.

The group then challenged the original theme headings and renamed, amalgamated and/or split the headings and groups to make them more relevant to ECI member companies, more specific, and more representative of the content of the cluster. Finally, they debated the structure and relationship between the categories and

between those which were internal and external to the industry and ECI. A structure for these levels and categories was eventually agreed (Figure 1).

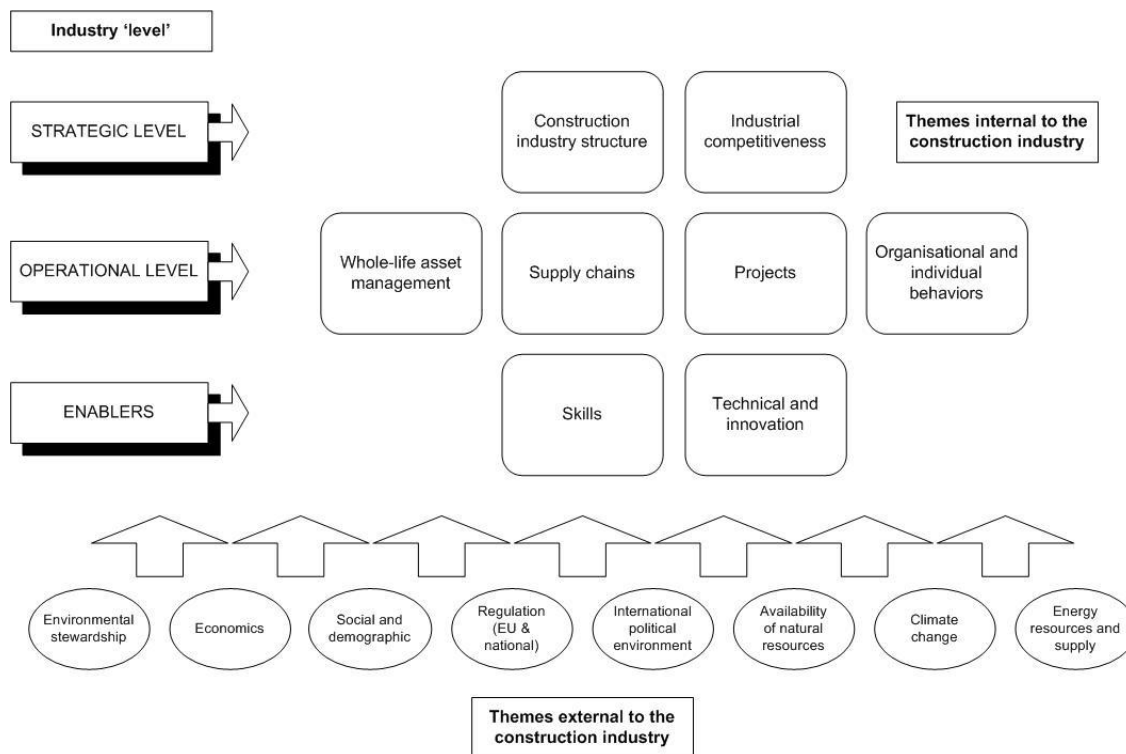


Figure 1: Construction industry level and categories

Issue and key area prioritisation (Workshop 3)

This workshop identified 3 or 4 priority areas that were key to ECI member companies, using the data from the previous workshop, as well as assimilating and discussing these key areas and related sub-issues, and to agree the next steps.

The previous workshop had produced a clustered list of 202 issues, factors and outcomes considered as important to the future of ECI member companies. A preliminary facilitated discussion was held regarding these areas, their clustering and their relevance to ECI members. Participants then identified the ten most important areas and discussed these in detail. The key areas resulting from this discussion were then consolidated into a single list and related areas clustered together. A debate was then held regarding which of these issues, factors and outcomes the Task Force should concentrate on as priority areas, i.e. those which:

- ECI members have some influence over,
- would be relevant and of interest to ECI members, and
- had not been looked at previously by ECI, or are currently being investigated sufficiently by similar groups.

The first three priority areas decided upon were, in no particular order:

- How to inspire young people to be interested in engineering and technology
- Energy scarcity
- How to encourage more cooperation in a fragmented supply chain

The group selected the next three potential priority areas as:

- Multicultural or inter-cultureprise
- Construction technology changes- driven by customer or industry

- Disaster response trends

Scenario generation and key characteristics (Workshop 4)

The priority issues identified in Workshop 3 provided the foundation for the development of the scenarios. These scenarios would look 20 years into the future and be relevant to ECI and its member organisations. A common futures studies method was applied to develop an integrated set of 4 scenarios based around a pair of intersecting axis (Ringland 1998, Harty *et al.* 2007) (Figure 2).

The horizontal axis was taken from priority area (b) energy scarcity, and illustrates a range from Energy scarcity (i.e. energy supply decreases as expected or is worse than expected) to Stabilised supply (i.e. where energy scarcity is not as bad as expected). This could be due to new reserves being discovered and/or technological advances in both supply and/or use of energy, which brings in priority area (e).

The vertical axis was taken from priority area (c) cooperation in a fragmented supply chain, together with aspects of (d) multicultural . Priority area (a) how to inspire young people was also influential here to form an axis Interdependent to Autonomous.

Using these two axis, the four scenarios A, B, C and D could then be developed, all of which combined elements of priority areas a, b, c, d and e. Priority area (f) was deemed as a 'trend' and therefore not suitable for an axis in itself, but which could be built into the resulting scenarios.

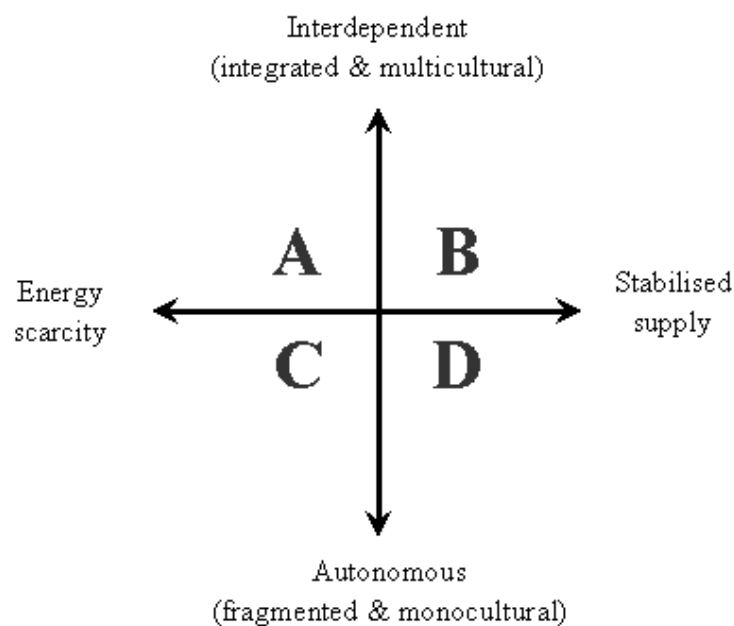


Figure 2: Scenario axes

Participants were split into mixed groups of client and provider and the 4 scenarios were developed by systematically investigating, debating and recording each constituent part of the future scenario e.g. demographics, technology, environment etc. Care was taken to ensure that the scenario constituents were consistent with the axis on which the scenario was constructed (Figure 2). The scenarios also needed to be plausible, robust, divergent, challenging, and useful to ECI and its members. The details of these constituent parts were then taken by the research team and were written into a scenario narrative.

Once the scenarios had been developed, they provided the foundation for a discussion on what the preferred future might look like for ECI and its member organisations. 5 key characteristics of this preferred future were then identified by the group:

- Collaboration: Collaborative targeted, shared innovations (for all)
- Stewardship: belief in benefits of collective behaviour and action and competition on CSR, value, shared goals, not cost
- Innovation: innovative interface control and standardisation of processes
- Natural Resources: managed energy consumption and reduce product energy consumption
- People: skills, image, training, education and radically improved CSR

Review scenarios, key characteristics and actions (Workshop 5)

In this workshop, the four scenario narratives drafted by the research team were reviewed and refined by the participants and the key actions for ECI and its member organisations for obtaining their preferred future were identified. The five key characteristics for ECI's preferred future were also debated, reviewed and expanded in light of the scenario development.

The key actions for ECI and its member organisations for obtaining their preferred future were then brainstormed, debated, and recorded for subsequent analysis. The Task Force agreed that they wanted the European construction industry of 2030 to be the world's principal centre of excellence in the development of the built environment and manufacturing facilities. In order to achieve this, the Task Force agreed upon a guiding vision for the industry:

- Be seen as an attractive, vibrant industry which school leavers, graduates and experienced professionals are attracted to and want to stay in
- Work in a way which encourages collaboration and support along the whole supply chain, and which feeds innovation and improvement
- Welcome and work with the shifts in world construction, in geographies, practices and requirements
- Develop and apply new construction techniques using the best available technology to improve the construction process in design, speed, safety, value and control
- Ensure our activities are energy-efficient and have a minimal effect on the environment.

Scenario names, timelines and Task Forces (Workshop 6)

The final workshop reviewed and finalised the future scenarios and debated the key actions for ECI and the future of the Task Force itself. Feedback from an ECI Executive Board meeting and the ECI annual conference was also presented and incorporated. Scenario names were discussed and agreed by the Task Force as shown in Figure 3.

Suggested timelines for each of the four scenarios were also drafted by the research team in advance of the workshop. These depicted a sequence of between five and ten events from the present day leading up to 2030 as suggested by each scenario. These were debated, modified and verified by the Task Force to ensure that they were realistic and sufficiently representative of each scenario.

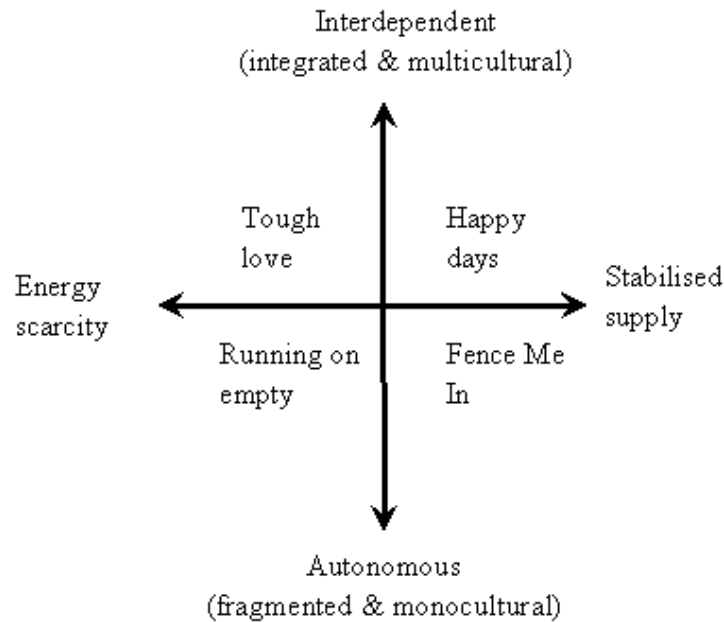


Figure 3. Scenario names and axes

The last activity identified the next steps for working towards the vision for ECI and its member organisations. The potential actions noted in the previous workshop were reviewed and refined. These next steps towards the vision would be delivered through collective Task Force action (and individual company actions). For the ECI, these were identified as:

- Support the Industry Futures Task Force, and especially the new task forces on people and on collaboration
- Run annual award schemes to recognise sustainability, collaboration, innovation, people and natural resources
- Work to expand membership, and its engagement in best practice
- Influence regulation
- Collaborate with other organisations to develop and promote best practice
- Encourage members' innovation
- Drive stewardship, corporate social responsibility, ethics and sustainability
- Help members to use natural resources more efficiently and protect the environment
- Define sustainable best practice for the design of the built environment and manufacturing plant
- Encourage member companies to get involved with renewable energy.

For Members of the ECI and those associated with the construction industry, the next steps towards the vision were identified as:

- Engage with the ECI and its task forces
- Collaborate along the supply chain to encourage innovation and best practice
- Increase R&D and take controlled risks to embrace new techniques
- Recognise the value of people
- Develop and reward them to attract and retain excellence
- Increase links with schools, universities and the supply chain to share and use best practice

- Implement local practices to improve environmental performance and encourage sustainable construction and use
- Enter the ECI award scheme.

It was agreed that the Industry Futures Task Force would continue with the establishment of direct links into two newly created Task Forces (with remits to focus on ‘collaboration’ and ‘people’), thereby highlighting new issues as they emerge and providing futures advice and expertise as required.

CONCLUSION AND REFLECTION

The ECI Futures Task Force investigated issues and factors that might impact upon the European construction industry over the next 10 to 20 years, resulting in the creation of four future scenarios, five key characteristics for ECI’s preferred future, and a set of Key Actions for the ECI and its member organisations. Two new Task Forces were agreed, one on ‘people’ and one on ‘collaboration’. The latter Task Force aligns closely with the vertical scenario axis (interdependent / autonomous) and has now been formed and a draft remit agreed. Meetings were held in February and June 2009, and further meetings will be held this year as work progresses (www.eci-online.org).

The value of this scenario-development process was found to be not only in the creation of scenarios and time lines, but in the course of their production where participants are involved in a debate regarding the future of a particular issue or topic. The process was successful in engaging participants in thinking about and discussing the future, as well as understanding the implications of their potential decisions. Participants regarded it as a general improvement on brainstorming exercises that they had experienced previously. Participants also recognised the benefit of the process in terms of stimulating debate and reaching a common understanding. It was remarked however, that it did take longer when compared with traditional brain-storming processes and was also deemed to be intellectually more demanding.

It was difficult at times for some of the participants to think about events and issues in the future, and occasionally some participants did make unrealistic speculations regarding the future, although the group workshop process helps to minimise these individual opinions. Firm and competent facilitation was essential to ensure that participants followed the structured methodology, but at the same time had sufficient freedom to discuss specific points of interest throughout the process. Ensuring that all the participants were sufficiently engaged and that none of the debates were dominated by a single personality was also essential.

As noted earlier, the construction industry is not noted for its long term strategic planning, and so any further research work on how to encourage firms and organisations in the sector to engage more and to plan further ahead, would be very valuable.

To conclude, the process summarised here has been shown to be able to successfully generate alternate future scenarios on a specific theme chosen by a mixed group of assorted individuals, organisations and/or stakeholders. It also enhanced participants shared understanding and can be used effectively to help identify and agree a potential path forward between interested groups on a particular theme.

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