

Key drivers of change and their implications for Construction Management research in the next decade: an eclectic approach

The ability of the construction industry to innovate and manage change has been the subject of controversy and debate for many years. However, when viewed in a holistic perspective, the industry has been slow in responding to changes in its environment. As a result, the construction industry in South Africa and elsewhere has been constantly criticized for being characteristically unresponsive to change. For the past 100 years, industry clients have demanded improvement and yet still, in the 2000s, the industry is underachieving, inefficient, wasteful and in need of radical change.

During the past two decades the construction industry has benefited from adaptation of change 'push factors' such as developments in management science, viz; value management, benchmarking, re-engineering, partnering, total quality management, concurrent engineering, computer science e.g. computer aided design and manufacturing, automation and robotics and artificial intelligence.

The lecture discusses some of the key factors that have affected and might continue to affect the construction industry and its ways of doing business. Using Hughes' Environmental Complexity Analysis, which provides a convenient conceptual and methodological framework for examination of changes taking place in the environment, the lecture shows that environmental changes have the effect of altering the usual methods and ways of doing business.

In the next decade it is probable that major influences will come from developments in the fields of nanotechnology, smart materials, electronic commerce, knowledge management, biomimetics, wireless technology and pervasive computing. Potential paradigm shifts may come from uncertain impacts of climate change; the promises and perils of converging technologies; shifts in regional demographics and world economic power.

Each environmental driver of change will have a different implication for construction management. Some of them will have revolutionary effects on the evolution of construction management. It is likely that we are going to see an industry that uses resources better, reduces waste and transforms the working environment of its people for better employment and greater productivity. It is also envisaged that there will be tremendous development in construction management and technology through realignment of the technical and business architecture fuelled by an e-commerce revolution and paradigmatic business process re-engineering. The knowledge based approach will allow construction management achieve a level of brief preparation, occupancy flow modeling, user comfort modeling far in advance of existing methods. *n*D computer visualisations for instance when interfaced with computer aided manufacturing, the design files can be directly transferred to manufacturing points, allowing components or complete buildings to be produced without fabrication drawings.

Thus key drivers of change might produce a high technology industry with systems, technology, people, products and levels of performance today's construction management cannot handle. As the winds of change blow over the industry, construction management will face challenges which are likely to be urgent, exciting and risky but very rewarding. Construction management needs to gaze into the change crystal ball and decipher the cryptograph. Construction management can only ignore change at its own peril!