

## Chapter 4

# Change through Innovation and Customer–Orientation

### ABSTRACT

*This chapter begins by explaining the nature of innovation and basic models of innovation, including key stages in the process of innovation. As the construction industry is often regarded as different from other industries given its unique characteristics, innovation in construction is discussed in terms of motivation for the industry's Small and Medium Enterprises (SME) to innovate, key organizational capabilities required for innovation, and external and internal factors critical to successful innovation. In addition, the common enablers, barriers, motivators, and outcomes of innovation in the construction industry are discussed. Understandably, as the role of clients in the construction industry is vital in many ways in driving to improve performance of projects, the chapter focuses on their role in driving innovation. The different types and categories of clients are described, as well as their roles in different types of innovations, and at different stages of innovation. The chapter also covers the role of technology in innovation and, more specifically, Computer-Aided Design (CAD) as an important technological innovation for the construction industry. At the organizational level, factors that can affect the rate of diffusion of a new technology within construction SMEs are explained. At the project level, factors that impact on innovative IT implementation and diffusion are also explained. Next, innovation and its role in enabling construction businesses to gain competitive advantages are discussed. The need to classify construction innovation and how it can encourage businesses to innovate by adopting appropriate strategies are explained through a case of Singapore's construction industry. In addition, the need for and application of strategies, policies, and procedures to deal with IT in managing construction site processes are described in a study of UK's leading construction companies. On achieving continuous improvement as a whole for the industry, issues relating to innovation, including reasons for the lack of it, are discussed and presented. On managing change, focus on the "people" factor of innovation, especially the need to develop capability of staff to use new technologies, is given. The chapter concludes with a summary of the main points covered on change through innovation and customer-orientation.*

DOI: 10.4018/978-1-4666-4185-3.ch004

## **NATURE OF INNOVATION AND ITS PROCESS**

The ways innovation has been defined and addressed are varied. Rogers and Schoemaker (1971) simply define an innovation as an idea, practice or object perceived as new by an individual. The OECD (1978, p. 1) states that "...innovation may be regarded as any new product favourably received by the market." Besides as a product, Rickards (1985) views innovation as any thought or behavior that is new. He further describes innovation as not a single nor an instantaneous act but a whole sequence of events that occurs over time and which involves all the activities of bringing a new product or process to the market. According to his argument, innovation consists of two sub-systems. The first relates to the firm and its capacity to deal with innovation, and the second comprises technological, economic, social, and institutional factors, which form the external environment. In some fields, the argument by von Hippel (1988, 2005) is that innovation users develop most innovations or, in other words, the innovators are most often users. In that context, he defines users as firms or individual consumers that expect to benefit from using a product or a service while, in contrast, manufacturers expect to benefit from selling it. He explains there can be several factors that drive users to innovate rather than buy and they involve agency costs which play a major role, as well as enjoyment of the innovation process which can be important. He further explains that when a user hires the manufacturer to develop a custom product, the user is then a principal that has hired the custom manufacturer to act as its agent, and if the interests of the principal and the agent are not the same, there will be agency costs incurred. On emphasizing the importance of the process of innovation, Tidd, Bessant, and Pavitt (2001) claim that failing to gain an understanding of its complexity and involvement of many different variables, functions and actors can result in a simplistic analysis of innovation based solely on

one of the many contributing aspects of the whole process. Ashworth and Hogg (2000) stress that innovation must deliver high added value, especially in changes of customary practices, and developing a strategy to involve people, practices, processes and technology is part of undertaking innovation.

The causes of innovation can be explained by the factors that are involved in each of the four main models to be described, as well as the progression from the first to the fourth (Jones and Saad, 2003). First, in the linear model, innovation is described as a sequence of stages which starts either from scientific research and known as 'Technology-Push' or some perception of a demand known as 'Need-Pull'. For 'Technology-Push', innovation is based on a science-based technological change and is the outcome of professional R&D activities. On the other hand, for the 'Need-Pull' model, innovation arises in response to a perceived market need that is recognized in order to trigger the whole process. In essence, the focus is on the user or customer as the starting point of the process of innovation instead of R&D activities. Second, the coupling model acknowledges there is a link between 'Technology-Push' and 'Need-Pull' and so the two are combined. The adopted view of this model is that major innovations take place as a result of the interaction of technology, science and market, rather than caused by a single factor only. Third, the integrated model includes the interactions between an organization's natural trajectory and the selection environment, in addition to the interaction of 'Technology-Push' and 'Need-Pull'. The ability of an organization to innovate is determined by market environments which are viewed as the basis of natural selection. Therefore, the interaction is not limited merely to technology and market but also affects the economic, social and institutional context in order to determine the best practice pattern for innovation. Fourth, the systems integration and networking model is built upon the concept that innovation is significantly and increasingly being influenced by the formation of networks, collaboration and

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