

When Australian Construction SME Implementing TQM

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Statistics show that construction industry contributes steadily and significantly to the national economy and SME always plays a major role. In order to offer “value for money” to the client and lower the operating cost, practising quality program is crucial. The aim of this paper is to investigate, via extensive literature reviews, how Australian construction SME should manage when implementing TQM strategy in the business model. In summary, there are four management implications: construction management, knowledge management, supply chain management and marketing management, which can enhance competitive advantage and favor commercial viability. One can reasonably conclude that quality improvements will lead to long term commercial advantages.

JEL Codes: M10, M11 and M19

1. Introduction

Total Quality Management (TQM) has been successfully adopted in many industries (Arditi & Gunaydin 1997; Beheshti & Lollar 2003; Berthelot et al. 2003; Hesan & Padibjo 1998; Lewis, Pun & Lalla 2007; Wong & Fung 1999). These concepts are also applicable to the construction industry. For example, Japanese construction companies, benefiting from the experiences of Japanese manufacturers, began implementing TQM during the 1970s. Even though construction is a creative, one-time process, Japanese construction industry embraced the TQM concepts that some argued could only apply to mass production (Arditi & Gunaydin 1997).

Small to Medium sized Enterprises (SME) play a major role in the economy of developed nations. An Australian study by Husband and Palmer (2002) indicate that the drivers for SME to adopt quality methods are covered in four dimensions: 1.customers; 2.competition; 3. legal; 4.organisational. This is worth for SME in Australia to pursue TQM. It is also noted that pressure from customers was the most popular reason for small businesses pursuing quality system in the business. Therefore, SME can implement TQM in order to cope with and enable 1.pressure from large customers; 2.reduce first time failure; 3.reduce costs of customer claims; 4.get things right first time; 5.improve service to customers and to increase competitiveness; 6.maintain contracts with existing customers (McAdam & McKeown 1999).

There are numerous research studies about quality issues of construction industry (Bowen et al. 2002; Dlungwana & Rwelamila 2003; McKim & Kiani 1995; Wong & Fung 1999; Zeng, Tian & Jonathan 2005) and SME (Beheshti & Lollar 2003; Cassells & Lewis 2011; Husband & Palmer 2002; Lewis, Pun & Lalla 2007; Rodgers 2010; Rodney, Federica Ricceri & Guthrie 2012). There also many research studies about TQM in SME in other countries including United States, United Kingdom, Denmark, North Ireland, Trinidad, Singapore, China, Japan and Hong Kong (Arditi &

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Gunaydin 1997; Beheshti & Lollar 2003; Hesan & Padibjo 1998; Kramer, Pfitzer & Lee 2005; Lewis, Pun & Lalla 2007; McAdam & McKeown 1999; Wong & Fung 1999; Zeng et al. 2003). However, there appears in short of recent research about adopting TQM concepts by SME in Australia to increase business opportunities. In fact, previous studies have not responded to the problem of how Australian small and medium construction organization can lever TQM strategy to improve their competitiveness and create long term commercial advantages. The aim of this paper is to investigate the management implication of implementing TQM by Australian construction SME to gain commercial viability.

In organising this research study, the author of this paper has undertaken extensive literature reviews to analyse what the precedent management implications, associated with TQM, are and how SME should do to increase their competitive advantages.

2. Literature Review

This section reviews 1.the nature and characteristics of construction SME which has significantly contributed to the economy and 2.the rationale for these SME to adopt TQM strategy as a viable solution improving quality programme.

2.1 Nature and Characteristics of Construction SME

In 2010, the gross domestic product (GDP) of Australian construction industry was some \$95b, around 1.5% to the global construction GDP. It will increase to 3% in 2020 (Betts et al. 2011), an increase over 100%. In fact, this industry always contributes steadily and significantly. According to ABS (2012b), between 2000–2001 and 2010–2011, the largest increase in industry gross-value-added share of GDP was construction; and during 2010-2011, construction industry is the 3rd GDP contributor. Year Book Australia 2012 also recorded that this industry employed some 1.04 million persons or 9.1% of total employment (ABS 2012a).

In fact, SME are not a homogenous group and by their very nature exhibit diversity, such as: size, industry type, location, trading framework, organisational framework (Husband & Palmer 2002). Australian SME represents most of the businesses. There were 1,233,200 private sector small businesses during 2000-2001, which represented 97% of all private sector businesses. They employed almost 3.6 million people (ABS 2002). In 2011, most Australian businesses are still small i.e. 95.9% (ABS 2012c), these SME provide over 95% of private sector employment and contribute significantly to GDP.

Since late 1980s and throughout the 1990s, the role of quality methods in Australian SME has been at the centre of much debate, focusing on quality methods, quality assurance, quality improvement, TQM and numerous others, and it applies in the SME context. This became a key issue for SME, as customer insistence on quality systems drove a number of SME to develop these systems, and in many cases SME were required or perceived a requirement to gain independent quality system certification (Husband & Palmer 2002).

Australian SME represents a significant proportion of Australian business and industry, especially in the construction sector. However, there is a perception that

smaller firms do not have the resources to implement TQM (Beheshti & Lollar 2003). In the next section, the author will discuss how construction SME adopts TQM.

2.2 TQM Solution for Construction SME

CIRIA (2000) discuss the strengthening trend of the modern client who is still determined to demand value for money. However, perhaps the most groundbreaking finding of construction industry acclaimed report identifies that clients are increasingly emphasizing that the delivery of a quality product in a safe and environmentally-friendly way is as important as delivering on time and to the right price. There is a need to enforce quality management.

TQM is an integrative philosophy of management for continuously improving the quality of products and processes, and it aims at improving the quality of processes to produce superior products at lower cost. Hence, management science and TQM should, in principle, be intertwined to attain efficient and cost-effective operations (Ahire 1997). According to Omachonu (2004), the total quality concept as a business strategy began to grow in popularity in the late 1980s and early 1990s, and TQM is the integration of all functions and processes within an organization in order to achieve continuous improvement of the quality of goods and services.

Amongst many TQM concepts, ISO environmental standards for quality management tend to benefit not only large business enterprises and the government but also the SME in giving them opportunities for market exportations and global supply participations (ISO 2006). Research studies suggest that implementing integration of ISO 9001 and ISO 14001 [i.e. the Environmental Management Systems] for construction benefits both quality management and environmental management systems (EMS) in a form of an overall TQM solution (Karapetrovic & Willborn 1998; Simon et al. 2011; Zeng, Tian & Jonathan 2005).

Mouatt (1997) adds that ISO 14000 can offer the framework for a construction company of any size to achieve tangible results without compromising their corporate goals. The broad intention of ISO 14000 is to provide the framework for a holistic, strategic approach to the organization's environmental policy, plans and actions. ISO 14000 gives the generic requirements for an EMS (Walck 1995). The underlying philosophy is that whatever the organization's activity; the requirements of an effective EMS are the same (Mouatt 1997). This has the effect of establishing a common reference point for communicating about environmental management issues between organizations, customers, regulators, the public and other stakeholders (McKinnon 2010). Chen et al. (2004) add that an EMS not only just provides 'a framework' for compliance to environmental legislation and regulations; it also charters the vision for a continual and long term commitment to the cause. Most importantly, current national data confirms the Australian adoption pattern of EMS is similarly weighted across almost every industry including construction (DSEWPC 2012). In other words, EMS is also applicable in Australian construction industry. In fact, Australia is one of the countries attempt and has made to implement TQM practices in the construction industry, and mostly relying on the ISO 9000 and ISO 14000 standards (Hoonakker 2006).

The ISO 14000 series of standards has been identified as offering the opportunity for construction organizations and individuals to pursue improved environmental

performance in a systematic and structured manner. Its underlying premise is the improvement of an organizations environmental performance in its normal operations through self-regulation and market driven pressure (Takahashi & Nakamura 2010). Most importantly, an EMS compliant with ISO 14000 is a management initiate that can achieve this goal for businesses in any industry and has been successfully applied to a broad range of businesses across the construction industry in Australia; from Tier One companies to smaller SME (Takahashi & Nakamura 2010).

3. Findings: Management Implication Increasing Competitive Advantage

If EMS is a solution of TQM, the direction of quality management is about how to fit it into the business management model. When implementing TQM in SME construction business, there are four precedent management implications, according to literature review, to be considered.

3.1 Construction Management (CM)

The construction industry is often criticized for poor performance on quality, cost, and time. Quality management has increasingly been adopted by construction companies as an initiative to solve quality problems and to meet the needs of the final customer. Better quality products and higher market share are often obtained with the adoption of TQM by the construction companies. (Kanji & Wong 1998). Aldridge and Oakland (1995) say that if ever an industry needed to take up the concept of TQM, it is the construction industry, because the industry does not appear to understand the concept of TQM, though contractors do see obvious benefits of quality improvement. McKim and Kiani (1995) also point out that by applying TQM, better construction can be achieved. Chase (1998) is contend in the construction industry, TQM as a tool can help to improve performance and application of TQM concept to the jobsite has been proven to speed-up projects while increasing profitability. All these are matter of improving constuction management perspectives.

Tang's report concludes that many small organisations in the construction industry do not have the requisite capabilities; and suggestes that SME must shift away from their traditional mode of operation [i.e. CM perspective] and adopt a more forward-looking approach to business development and that exceed customers' expectations through improving their own technical and management capabilities (CIRC 2001). That means SME have to improve CM perspective to more quality focused, which is about TQM.

There is no doubt that TQM improves CM and thus enhances competitive advantage. In fact, there is enormous potential for TQM in the construction process. Project delivery and success has been traditionally viewed and measured as management of a three-legged stool, with the legs defined as cost, schedule and quality (Chan, Walker & Mills 2006). In a construction project, as a guide, increase in quality results in an increase in time; increase in time results in an increase in cost; increase in quality results in an increase in cost. The decision is quality is value for money. According to Arditi and Gunaydin (1997), the factors that affect

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quality in each phase of the construction process have been identified as management commitment and leadership, teamwork, training, supplier involvement, statistical methods, customer service, cost of quality and construction industry-specific factors [i.e. quality of codes and standards, drawings and specifications, constructability analyses]. CM is about to manage the iron triangle of a construction project (Atkinson 1999). In other words, this is tantamount to saying that the client's objectives can be achieved through a management effort that recognises the interdependence of time, cost and quality (Bowen et al. 2002).

There is no denial reason that construction SME not to adopt TQM in CM to improve competitive advantage and increase commercial viability.

3.2 Knowledge Management (KM)

TQM and KM have successfully and repeatedly proved in perspective fields as an effective management instruments. According to Beckford (2002), TQM adds value to an organization in two areas. First, it demands that those responsible for the organization develop a full appreciation of the theory and practice of organizational design and behaviour. The second area is the requirement for the establishment of formal quality councils at lower levels in the organization. Obviously, this is the basic KM concept. (Aboyassin, Alnsour & Alkloub 2011)'s study indicates that KM processes [diagnosing, acquiring, generating, sharing, storing, and application] do influence TQM. In fact, over the past few decades, many parts of the global economy have moved towards a knowledge base, in which wealth creation is associated with the challenge of developing and managing knowledge resources.

Loke et al. (2012) state that the purpose of TQM and KM practices focuses on work-processes improvement on a firm so that high customer satisfaction can be derived. In fact, TQM emphasizes on quality improvement in all functional areas and at all levels in a firm and its practices will have a significant positive impact on KM practices. Then, the quality management practices promote higher level of KM practices. This is because the implementation of quality planning, control and assurance requires regular reviews and continuous inputs to enable and sustain excellence in performance.

When study KM in construction industry, effective management of knowledge in the construction industry is likely to produce innovation, reduce project time, and improve quality and customer satisfaction (ABS 2012a; Kamara et al. 2002). KM leads to the knowledge advantage which can facilitate sustainable competitive advantage (Chan, Walker & Mills 2006). Dent and Montague (2004) also say that competitive advantage relies on informed decision-making within construction organization, KM will be a decisive component of successful future businesses.

When studying KM in Australian SME, Coyte et al. (2012) recommend if SME has no formal KM system, nor does it prepare reports of its knowledge resources, in order to manage them and compete with others, there is a need for informal controls structured and encouraged intensive dialogue between the managers and with other staff across the organization. These may provide an agility and responsiveness which large enterprises would be unlikely to achieve.

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Obviously, knowledge is being recognized as a vital resource and source of competitive advantage in today's dynamic and changing business environment (Burton-Jones 1999). (ABS 2012b)'s analysis shows that KM systems provide functionality that goes well beyond the functions that to a great extent fall under quality management too. Therefore, it is worthwhile applying the KM approach to quality management in order to facilitate innovations, effectiveness of business processes and thus provide organization competitiveness in the market. In other words, TQM integrates with KM will greatly improve SME's competitive advantage and commercial viability.

3.3 Supply Chain Management (SCM)

Kanji and Wong (1998) state that SCM and TQM are concept or approach that can be applied as initiatives to solve the quality problems in construction industry and meet the needs of final customers. The supply chain in the construction industry may be: owner>consultants>main contractor>subcontractors>suppliers. Each actor in the supply chain has its role to play. Construction SME may be the main contractor, subcontractors or specialist subcontractors. Loke et al. (2012) add that TQM and SCM are said to be the most important strategies for many different companies: from SME to giant manufacturers and servicing companies. The authors study how to integrate TQM and KM into a unified framework to study supply chain learning among collaborating firms. They find that both TQM and KM are significantly positively related to supply chain learning. However, the success of SCM depends largely on the firm's efficiency in managing its TQM processes.

TQM is part of the SCM to streamline the quality process and enhance production efficiency. In fact, according to Wong and Fung (1999), TQM should incorporate the integrated quality management activities of all members in the supply chain. Construction business relationships are a series of transactions between owners and contractors with the involvement of architect and engineer. However, the ever-increasing global competitive nature of the business environment has forced corporations to develop strategies to become low cost producers and to differentiate their goods and services from their competition. Through customer-focused quality programmes, quality lowers the cost and will become a powerful product differentiation to customers (Beheshti & Lollar 2003). If SCM becomes mandatory in the total quality objectives of a general contractor in the construction industry, the quality management tasks of a general contractor are complex, given the totality of quality features demanded by customers, as well as the multitude of actors in the supply chain, each bearing differing objectives, technology, resources, and level of interdependence with other upstream and downstream actors (Wong & Fung 1999). Lewis et al. (2007) agree that this becomes critical for the top management of SME to recognize their own critical nature and be clear on content and process. The key objectives of management commitment are therefore environmental and quality focused. In the construction industry, the message of TQM must be spread to each level as well as tight quality control is enforced in each tier of the chain. Therefore, SME to improve TQM in SCM is a critical before gaining competitive advantage and commercial viability.

3.4 Marketing Management (MM)

TQM is a capable strategy into potent marketing initiatives and adding to the faddish TQM imagery is the way legions of corporations jumped headlong into the mid-1980's quality movement (Donath 1993). Therefore, SME should market their TQM approach and those SME undertaking construction businesses should promote their corporate and social responsible image.

Findings by (Ofori et al. 2000) confirm that from a global perspective, the construction industry contributes significant and sometimes even irreversible impacts on to the environment. As with any industry, large Australian construction companies are often viewed as inflicting the most negative impacts on the environment simply due to their large size. However, it is important to realize that collectively Australian construction industry SME inflict a significant impact upon the environment via their activities, products and services. Australian construction industry SME are therefore in a position of influence hinged on awareness (Battisti & Perry 2011). Essentially, this means that this sector of the industry are able to make important contributions to the environment if they can simply recognize the power they possess and act to implement environmentally aware changes within their businesses (Rodgers 2010).

There is a need to change the negative mindset of people towards construction companies and marketing the positive environmental corporate social responsibility (CSR) image.

Kyung Hoon et al. (2009) investigate the dynamics underlying relationships among marketing strategy, sustainable competitive advantage, corporate image and employment brand equity. The authors agree that different groups of people perceive an organization in a different manner. This corporate image is influenced by community and environmental responsibility, financial soundness, innovative communications, quality of management and quality of products/services (Lemmink, Schuijf & Streukens 2003). According to a survey of 131 Canadian companies undertaking implementation and certification of an EMS to ISO 14001 standards, these business had improved their corporate image and environmental performance through ISO 14001 certification (Berthelot et al. 2003). Therefore, SME can make use TQM to lever and market their CSR image.

According to Ghobadian et al. (2007), CSR and TQM share similar philosophical roots. There is a substantial overlap between the elements of these two concepts, and that the ultimate expected outcome shows significant similarities. It is therefore important to recognize the specific needs of CSR and include them as an integral part of TQM. Protecting the environment and reducing individual impact is seen as a duty, alongside the responsibility toward family, staff, the local community (Battisti & Perry 2011). Business organization cannot build a CSR system without a strong foundation, the role of quality management and business excellence frameworks become obvious hooks to embed these values and behaviours. Therefore, integrating CSR into quality management frameworks, particularly in relation to policy and strategy, should help to ensure that CSR is something more than a passing fad (Hazlett, McAdam & Murray 2007). Robson and Mitchell (2007) also suggest that there is significant impact of TQM implementation on external CSR

performance. This may then establish its own place in the overall business excellence framework and create a positive corporate brand.

In a business world which is moving ever faster toward social responsibility, it is perhaps exactly quality as ethical elements which will determine the success of small and large businesses alike (Rodgers 2010). Most SME know that the customer's impression of an organization is important. TQM relates to marketing SME's corporate and social responsible identity can promote corporate reputation and lead to better competitive advantage.

5. Summary and Conclusions

Every purchase decision is a function of price and quality. Price is generally known, but quality is in the mind of the individual customer. A TQM system is the big picture which is primarily concerned with customer satisfaction and all activities conducted by the small and medium construction organization. TQM strategy is directed towards improving their operation processes so as indirectly maximising competitiveness. Although TQM may not be 'the one best way' to directly attract commercial viability and business opportunities, construction SME can achieve better reputation due to provision of higher quality. Then, their competitiveness can be improved and business potential eventually enhanced.

Through extensive literature reviews, the results of this paper do support previous theories and findings that proper management commitments in TQM are required. At the very first, construction SME's management attitude and action to quality and desire to continuous quality improvement are vitally important in each phase of the building process. This is obviously about organizational commitment to maintain their focus in quality matters through the CM perspectives. In addition, when TQM emphasizes on quality improvement, this will require working knowledge of all functional areas is properly managed and available at all times without re-inventing wheel. Apparently, it is about running KM in the construction SME. Furthermore, the supply chain context is especially salient in the quality assurance of construction projects as the industry is characterised of a chain of participants. TQM is concerned with a holistic approach to continuously meeting owners' needs in the most competitive ways and this requires the integration of TQM and SCM. Last but not the least, as construction industry is notorious and being criticised for poor quality and in lack of CSR, if construction SME requires promoting a positive image, it is vital for them to consider marketing the TQM concept of their organization. This must be perceptibly started from the related MM strategy.

Although this paper has not created new management knowledge, these results have moved the body of knowledge forward by originally and timely providing a management roadmap for construction SME to implement TQM. That is about if Australian small and medium construction organizations intend to lever TQM strategy improving their competitiveness and creating long term commercial advantages, they must include CM, KM, SCM and MM in their management agenda. However, there are limitations of this paper, because of other challenges facing by construction SME. Coyte et al. (2012) suggests that there are four barriers 1.resource and administrative constraints; 2.lack of an objective inside environmental audit team; 3.unique entrepreneurial culture; 3.cost of third party

registration. Further research can be in resource management for TQM implementation.

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