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Impact of TQM and organizational learning on innovation performance in the high-tech industry

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ABSTRACT

Many scholars have suggested that both total quality management (TQM) and organizational learning can individually and effectively promote innovation. However, the question remains as to whether a relationship exists between TQM and organizational learning. This study has three main goals: (1) to determine the relationships between TQM, organizational learning, and innovation performance; (2) to determine if organizational learning fosters innovation performance and plays a mediating role between TQM and innovation performance, and (3) to test a proposed model explaining the relationships among TQM, organizational learning, and innovation performance through empirical examination.

Using a self-administered survey to sample Taiwanese high-tech industry companies, this study examines four hypotheses and tests the proposed model. The principal findings of this study are as follows; (1) SEM analysis shows that the TQM-organizational learning-innovation performance model has goodness-of-fit, (2) TQM has significant and positive effects on organizational learning, and (3) TQM and organizational learning have both significant and positive effects on innovation performance.

1. Introduction

Many researchers have stated that the total quality management (TQM) strategy is a potentially useful tool for fostering learning and increasing a company's competitive advantage (Hendricks & Singhal, 2001; Martinez-Costa & Jimenez-Jimenez, 2008; Martinez-Lorente, Dewhurst, & Gallego-Rodriguez, 2000; Terziovski & Samson, 2000; Walley, 2000). Rapidly changing markets require the development of technological innovation, and shorter product lifecycles constantly challenge the competitive advantage (Baker & Sinkula, 1999; Prajogo & Sohal, 2003; Tidd, Bessant, & Pavitt, 1997). According to Bontis, Crossan, and Hulland (2002) and Nonaka and Takeuchi (1995), learning ability can stimulate organizational innovation capability and maintain a competitive advantage in turbulent environments.

Learning promotes innovation activities, and "quality" is the principal determinant of success in competitive environments (Deming, 1986). Consequently, enterprises can sustain a competitive advantage by continually reproducing

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product and management quality. Although Barrow (1993) suggested that organizational learning is the principal outcome of TQM, only three empirical and quantitative studies examine the relationship between TQM and organizational learning (Martinez-Costa & Jimenez-Jimenez, 2008, 2009; Ruiz-Moreno, García Morales, & Llorens-Montes, 2005). In addition, above quantitative studies only focused on three types of firms. Most of these firms were in the manufacturing sector, with some in the service sector, and included small-to-mid sized enterprises. National economies are increasingly recognizing the contributions of the high-tech industry for achieving and sustaining growth and performance (Collins & Clark, 2003; D'Aveni, 1998; Lien, Hung, & McLean, 2007). Taiwan's high-tech industry has a reputation for high product quality and high innovation performance (Hung, Lien, & McLean, 2009). Whether the proposed relationship among TQM, organizational learning, and innovation applies to Taiwan's high-tech industry requires further confirmation.

Although some TQM practices have proven unsuccessful, previous empirical research shows that TQM has a positive effect on organizational performance, including innovational performance (Martinez-Costa & Jimenez-Jimenez, 2008; McAdam & Armstrong, 2001; Prajogo & Sohal, 2003). Some studies indicate a relationship between organizational learning and innovation (Baker & Sinkula, 1999; Hung et al., 2009). Consequently, both TQM and organizational learning can individually and effectively promote innovation. However, no previous empirical studies investigate whether organizational learning mediates TQM and innovation performance. Nevertheless, how do TQM and organizational learning jointly affect organization innovation performance? Determining whether such a mediating relationship exists is worthy of further study.

The purpose of this study is to examine three things. This study focuses on (1) determining the relationships between TQM, organizational learning, and innovation performance, (2) examining if organizational learning foster innovation performance play a mediating role between TQM and innovation performance, and (3) testing a proposed model to explain the relationships among TQM, organizational learning, and innovation performance through an empirical examination. This paper begins with a literature review that examines the current state of TQM, organizational learning, and innovation performance. An empirical research using structural equation modeling to test the proposed model follows. The final section presents the findings, theoretical and managerial implications, and limitations of this study, and provides recommendations for future research.

2. Literature review

2.1. Total quality management

Various approaches to TQM concept have led to different definitions. For example, Persico (1989) presented TQM as a method for reforming corporate culture, enhancing employee involvement in each business sector, and continuously improving quality to attain specific organizational goals through teamwork. Evans and Lindsay (1996) pointed out that TQM is a management approach that focuses on quality and aims at improving organizational effectiveness and flexibility. Easton and Jarrell (1998) suggested that TQM generates high-quality products, reduces costs, increases customer and employee satisfaction, and improves financial performance. Although TQM has a variety of definitions, Rahman (2004) showed that TQM is a management approach for improving organizational performance that encompasses a variety of both technical and behavioral topics.

Different researchers have adopted different dimensions of TQM (EscrigTena, BouLlusar, & RocaPuig, 2001; Martinez-Lorente et al., 2000; Mohrman, Tenkasi, Lawler, & Ledford, 1995; Zairi, 1997) to test its effects on company product quality and other non-financial results (Terziovski & Samson, 2000; Zhang, 2000). Prajogo and Sohal (2003) examined manufacturing firms by measuring and assessing TQM using the following six dimensions; leadership, strategic planning, customer focus, information technology and analysis, people management, and process management. Lee and Asllani (1997) showed that top management must take a leadership role and show a strong commitment when initially implementing TQM. According to Zairi (1997), TQM also focuses on the level of support of top management and emphasizes complete employee involvement in the related continuing improvement initiatives.

However, most previous studies agree that the most influential dimensions of TQM include; (a) top management support, (b) employee involvement, (c) continuous improvement, and (d) customer focus (Juran, 1988; McAdam & Armstrong, 2001; Prajogo & Sohal, 2003; Zairi, 1997).

2.2. Organizational learning

Argyris and Schon (1996) noticed that when all of the members become aware of the cognitive outcomes and newly shared mental models, including work processes and individual jobs, learning develops into organizational learning. Therefore, a learning culture in which people work together can support an organization by nurturing and sustaining a knowledge-creating system (Wang, Yang, & McLean, 2007). However, organizational learning has a variety of definitions. From a strategic perspective, according to Crossan, Lane, White, and Djurfeldt (1995), organizational learning strategies and company culture should be adaptable to the company environment. From a systematic perspective, Senge (1990) defined organizational learning as a dynamically balanced relationship in which organizations acquire external knowledge and further adjust organization activities. This relationship helps to balance the environment and organizational operation process while the organization struggles to survive. In addition, organizational learning can be divided into individual, team, and organization levels (Inkpen, 1998). From a process perspective, Dodgeson (1993) pointed out that organizational