



Relationship between quality management practices and innovation

Dong-Young Kim^{a,*}, Vinod Kumar^{b,1}, Uma Kumar^{b,2}

^a Coggin College of Business, University of North Florida, 1 UNF Drive, Jacksonville, FL 32224-7699, USA

^b Sprott School of Business, Carleton University, 1125 Colonel by Drive, Ottawa, ON K1S 5B6, Canada

ARTICLE INFO

Article history:

Received 20 August 2010

Received in revised form 13 February 2012

Accepted 24 February 2012

Available online 15 March 2012

Keywords:

Quality management practices

Radical product innovation

Radical process innovation

Incremental product innovation

Incremental process innovation

Administrative innovation

ABSTRACT

The purpose of this study is to examine the associations among different quality management (QM) practices and investigate which QM practices directly or indirectly relate to five types of innovation: radical product, radical process, incremental product, incremental process, and administrative innovation. We test the proposed framework and hypotheses using empirical data from ISO 9001 certified manufacturing and service firms. The results show that a set of QM practices through process management has a positive relationship with all of these five types of innovation. It was found that process management directly and positively relates to incremental, radical, and administrative innovation. Organizational capability to manage processes may play a vital role in identifying routines, establishing a learning base, and supporting innovative activities. The findings also reveal that the value of an individual QM practice is tied to other QM practices. Therefore, highlighting just one or a few QM practices or techniques may not result in creative problem solving and innovation.

© 2012 Elsevier B.V. All rights reserved.

1. Introduction

Over the last 30 years, innovation has caught the attention of researchers and practitioners (Gatignon et al., 2002; Damanpour, 1987). In a turbulent economic environment, innovation is a strategic driver in seizing new opportunities and protecting knowledge assets (Hurmelinna-Laukkanen et al., 2008; Teece, 2000). Specifically, innovation plays a key role in providing unique products and services by creating greater value than was previously recognized and establishing entry barriers (Lloréns Montes et al., 2005). The importance of innovation has motivated researchers to identify the various driving forces of innovation (Becheikh et al., 2006). Some researchers contend that quality management (QM) could be one of the prerequisites of innovation (Hoang et al., 2006; Perdomo-Ortiz et al., 2006). QM practices contribute to operational and financial performance, allowing a firm to achieve a competitive advantage (Lagrosen and Lagrosen, 2005; Kaynak, 2003). It is not surprising that many manufacturing and service firms around the world (e.g., Xerox, Ford, Motorola, and Federal Express) have adopted QM over the last two decades (Rahman, 2004; Powell, 1995).

Since the early 2000s, researchers have conducted empirical studies on the relationship between QM and innovation. While

previous studies have provided interesting insight into the role of QM practices in innovation, a few shortcomings in these studies emerge from the literature review. First of all, earlier studies failed to explain which QM practices are directly or indirectly associated with innovation. Most studies examined only the direct relationship between QM practices and innovation. Researchers have tended to identify whether the implementation of QM practices is positively related to innovation (e.g., Abrunhosa et al., 2008; Martinez-Costa and Martinez-Lorente, 2008; Hoang et al., 2006) or which QM practice is directly related to innovation (Moura et al., 2007; Prajogo and Sohal, 2004). Second, researchers were limited to assessing only a few types of innovation. Some studies examined a single type of innovation, such as process innovation (e.g., Abrunhosa et al., 2008) or product innovation (e.g., Prajogo and Sohal, 2004), whereas others explored both process and product innovation (e.g., Feng et al., 2006; Martinez-Costa and Martinez-Lorente, 2008). Looking at the earlier studies, two questions arise: Is it worthwhile to examine QM practices that can lead to only product and process innovations? If not, what other types of innovation should be explored to clearly address an association between QM and innovation? These studies devoted only limited attention to examining various types of innovation. This narrow view of innovation may be a barrier that causes a misunderstanding of the contribution of QM to innovation. The multidimensional types of innovation need to be tested to correctly understand the real value of QM on innovation. Third, earlier studies on the relationship between QM and innovation have provided inconsistent findings (See Appendix A). Some found that QM practices are positively related to innovation (e.g., Perdomo-Ortiz et al.,

* Corresponding author. Tel.: +1 904 620 5865.

E-mail addresses: d.kim@unf.edu (D. Y. Kim), Vinod.Kumar@carleton.ca (V. Kumar), Uma.Kumar@carleton.ca (U. Kumar).

¹ Tel.: +1 613 520 2379.

² Tel.: +1 613 520 6601.

2006; Martinez-Costa and Martinez-Lorente, 2008), whereas others concluded that there is no evidence linking QM activities and innovation (e.g., Singh and Smith, 2004; Moura et al., 2007; Prajogo and Sohal, 2004; Santos-Vijande and Álvarez-González, 2007).

This study explores the following two questions: What relationship exists among QM practices? Which QM practices are directly or indirectly related to innovation? We concentrate on the research questions by conducting an empirical study of manufacturing and service firms. The objective of this study is to empirically investigate the relationships among QM practices and to explore which QM practices are directly or indirectly associated with five types of innovation: radical product, radical process, incremental product, incremental process, and administrative. The remainder of this study is organized as follows. The following section describes the extant literature, gives a research model, and presents hypotheses. The next section presents methodology, including data collection, measurement scales, measurement analysis, and hypothesis testing. Finally, this study concludes with a discussion, notes the implications of the results, and gives suggestions for future research.

2. Theoretical background and hypotheses

This section discusses four topics: QM practices, classification of innovation, the relationship between QM and innovation, and a research model.

2.1. QM practices

QM is a holistic management philosophy that fosters all functions of an organization through continuing improvement and organizational change (Kaynak and Hartley, 2005). QM captures features from distinct organizational models and extends them by offering principles, methodologies, and techniques (Spencer, 1994). Researchers emphasize that it is necessary for firms to define and develop QM practices that can assist a multi-dimensional management philosophy. QM practices refer to critical activities that are expected to lead, directly or indirectly, to improved quality performance and competitive advantage (Flynn et al., 1995).

Much attention in the research has been devoted to developing measurement constructs of QM and examining the association between QM practices and performance. Saraph et al. (1989) provide the first attempt to explore the measurement of QM practices (Perdomo-Ortiz et al., 2006). Their motivation is fuelled by the lack of a systematic attempt to organize a set of QM practices and the need to develop measures of the overall QM efforts in the literature. Using a survey of 162 general managers and quality managers, they propose and test eight critical factors of QM: the role of management leadership, the role of the quality department, training, employee relations, quality data and reporting, supplier quality management, product/service design, and process management. Similarly, Flynn et al. (1994), in their survey of 716 respondents, argue that QM studies on theory development and measurement failed to yield conclusive evidence related to validity and reliability. They suggest seven key dimensions of QM and scales: top management support, quality information systems, process management, product design, workforce management, supplier involvement, and customer involvement. Although there is little agreement on the list of QM practices (Samson and Terziovski, 1999), the efforts to develop a set of QM practices provide a theoretical foundation to scientifically connect traditional QM philosophies with practical activities.

The existing empirical research on the relationship between QM practices and performance is characterized by examinations of the interdependent nature of QM practices. Researchers view an

organization to be a system of interlocking processes. The research, called linkage-oriented research, mainly tests associations among QM practices (Sila and Ebrahimpour, 2005). The linkage-oriented research relies on sophisticated analysis techniques, such as structural equation modeling, path analysis, and partial least square method (e.g., Flynn et al., 1995; Ravichandran and Rai, 2000) because the research mainly includes a complex research model with many variables. Actually, researchers have provided mixed findings on the relationships among QM practices. We, however, find two common views in the literature. The first view is that the successful implementation of QM can be attributed to the strong support of a combination of a series of practices, not just a few practices separately (Ravichandran, 2007; Nair, 2006; Schendel, 1994; Douglas and Judge, 2001). The second view is that QM practices could lead to improved performance in areas such as quality, operations, innovation, and business results (Flynn et al., 1995; Ravichandran and Rai, 2000; Hoang et al., 2006; Kaynak, 2003). We regard these views as basic assumptions in this study.

2.2. Classification of innovation

Innovation refers to new applications of knowledge, ideas, methods, and skills that can generate unique capabilities and leverage an organization's competitiveness (Andersson et al., 2008; Daft, 1978). This definition reflects a broader view of innovation by covering both administrative and technological innovation. In a global market, firms should have the ability to identify new chances, and to reconfigure and shield technologies, competences, knowledge assets, and complementary assets to accomplish a sustainable, competitive advantage (Teece, 2000). It is necessary to understand a type of innovation and its different features, because a specific type of innovation requires an organization to demonstrate unique and sophisticated responses. Researchers have explored the classification of innovation in different ways. Although previous studies have proposed various classifications of innovation, we found that empirical studies on innovation have explored five types of innovation: incremental product, incremental process, radical product, radical process, and administrative (e.g., Salavou and Lioukas, 2003; Di Benedetto et al., 2008; Herrmann et al., 2007; Vermeulen, 2005; Chandy and Tellis, 1998). We argue that investigating the various types of innovation helps practitioners break down their overall strategies on innovation into a particular type of innovation area and efficiently allocate resources for a specific type of innovation. Thus, our study applies the five types of innovation to analyze correlations with QM practices. In order to distinguish the five types of innovation, we need to discuss the differences between administrative and technological innovation; incremental and radical innovation; and product and process innovation.

Innovation is first split into administrative and technological innovation. *Administrative innovation* refers to the application of new ideas to improve organizational structures and systems, and processes pertaining to the social structure of an organization (Weerawardena, 2003; Damanpour, 1987). In contrast, *technological innovation* is defined as the adoption of new technologies that are integrated into products or processes (Yonghong et al., 2005). Administrative innovation is often triggered by internal needs for structuring and coordination, while technological innovation mainly responds to environmental factors, such as uncertain market conditions or technical knowledge (Daft, 1978; Gaertner et al., 1984). Administrative innovation uses a top-down approach where upper level managers commit to relevant activities, whereas technological innovation applies a bottom-up approach where lower level technicians are involved (Daft, 1978). Administrative innovation requires considerable set-up costs and entails

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات