

Chapter 1 Introduction¹

1.1 Confusion about TQM

1.1.1 TQM Concept

Over the past few decades, quality gurus such as Deming (1986), Juran (Juran and Gryna, 1993), Crosby (1979), Feigenbaum (1991), and Ishikawa (1985), the primary authorities of total quality management (TQM), have developed certain propositions in the field of TQM, which have gained significant acceptance throughout the world. Their insights provide a good understanding of the TQM philosophy, principles, and practices. After careful study of their work, it has been found that these quality gurus have different views about TQM, although some similarities can be found. Worldwide, there are several Quality Awards such as the Deming Prize (1996) in Japan, the European Quality Award (1994) in Europe, and the Malcolm Baldrige National Quality Award (1999) in the United States of America. Each award model is based on a perceived model of TQM. However, the three award models are different from each other and each has its own characteristics. In the field of TQM implementation, much research has already been conducted, different researchers adopting different definitions of TQM. The concept is still a subject of debate (Easton and Jarrell, 1998), still a hazy and ambiguous concept (Dean and Bowen, 1994). So far, TQM has come to mean different things to different people (Hackman and Wageman, 1995).

1.1.2 Effects of TQM Implementation

TQM has been widely implemented throughout the world. Many firms have arrived at the conclusion that effective TQM implementation can improve their competitive abilities and provide strategic advantages in the marketplace (Anderson et al., 1994a). Several studies have shown that the adoption of TQM practices can allow firms to compete globally (e.g., Easton, 1993; Handfield, 1993; Hendricks and Singhal, 1996, 1997; Womack et al., 1990; American Quality Foundation and Ernst & Young, 1991). Several researchers also reported that TQM implementation has led to improvements in quality, productivity, and competitiveness in only 20-30% of the firms that have implemented it (Benson, 1993; Schonberger, 1992). A study conducted by Rategan (1992) indicated that a 90% improvement rate in employee relations, operating procedures, customer satisfaction, and financial performance is achieved due to TQM implementation. However, Burrows (1992) reported a 95% failure rate for initiated TQM implementation programs; Eskildson (1994) and Tornow and Wiley (1991) reported that TQM implementation has uncertain or even negative effects on performance. Longenecker and Scazzero (1993) indicated that achieving

¹ Parts of this chapter were drawn from the author's previous publications: Zhang (1997a, 1998a, 1998c, 1999a, 2000b). Concerning quality management related to China, please refer to these publications for details.

high product quality and pursuing successful TQM implementation are highly dependent on top management support. However, Motwani et al. (1994) reported that there is no association between top management support for quality and the level of product quality achieved. Many researchers suggested that effective product design can lead to the improvement of product quality (e.g., Gitlow et al., 1989; Juran and Gryna, 1993), whereas Motwani et al. (1994) reported that there is no relationship between systematic product design and the level of product achieved. Recently, Rungtusanatham et al. (1998) attempted to replicate, as closely as possible, empirical evaluation of a Deming-based theory of quality management conducted by Anderson et al. (1995). In their replication study, they used data obtained from three different Italian industries to compare with the reported results in Anderson et al. (1995), which used data from US-based firms. It was interesting to find that the research results between the two studies differed considerably. Thus, conflicting research findings have been reported surrounding the effects of TQM implementation on overall business performance.

These seemingly conflicting results were also found in Chinese manufacturing firms. TQM has been introduced in China from 1978 onwards. In order to encourage firms in implementing TQM, great efforts have been made by the Chinese government. As a result, an increasing number of firms implemented TQM; in a survey conducted by Yu et al. (1998), 96% of responding firms reported that they had done so. Therefore, it can be said that the rate of TQM implementation is very high in Chinese manufacturing firms. However, Yu et al. (1998) also stated that the effectiveness of the deployment of TQM in Chinese firms is still puzzling. As to how effective the implementation truly is, that may be another story. According to Zhao et al. (1995), China still lacks effective TQM systems and application at the firm level. Some basic quality principles and modern quality management methods have not been widely used by Chinese manufacturing firms. Based on the results of the state supervision and inspection of product quality, it can be concluded that China's product quality as a whole is still at a relatively low level. Table 1.1 lists the sample inspection results from 1986 to 1995.

What is TQM implementation really going on in Chinese manufacturing firms? The existing literature has shown that no large-scale empirical research has been systematically conducted dealing with TQM practices and their effects on overall business performance in Chinese manufacturing firms. In order to bridge this gap, an investigation into the effects of TQM implementation in Chinese manufacturing firms is truly needed. Such a study can explore the degree of the impact of TQM implementation on overall business performance in firms and help in identifying problem areas and possible remedies.

Table 1.1 The Average Sample Conformity Rates From 1986 to 1995

Year	Average conformity rates	Large-sized firms	Medium & small-sized firms	Township firms
1986	71.2%	88.1%	76.7%	63.0%
1987	77.9%	86.9%	73.4%	69.6%
1988	76.6%	85.5%	74.2%	64.7%
1989	75.3%	83.1%	75.2%	61.2%
1990	76.9%	84.1%	77.9%	56.2%
1991	80.0%	91.1%	78.4%	67.2%
1992	70.1%	88.0%	69.3%	51.8%
1993	70.4%	84.1%	70.7%	58.2%
1994	69.8%	85.0%	66.2%	67.6%
1995	75.4%	88.6%	73.4%	67.2%
Total average	73.6%	86.3%	72.3%	60.8%

1.2 TQM Implementation in China

Based on the author's thorough literature review, the TQM implementation in China has been identified. This section presents the brief review results. In 1978, the Beijing Internal Combustion Engine Factory and the Qinghe Woollen Mill started to implement TQM through cooperating with their foreign partners. In the meantime, a number of experts and scholars began to disseminate the knowledge of TQM to firms. In September 1978, some firms began to introduce QC circle activities. On 24 August 1979, the excellent QC circles' reports were presented in Beijing. On 31 August 1979, the China Quality Control Association was established. One of its duties was to cooperate with relevant governmental agencies to promote TQM in the country. Because of the significant effects of TQM implementation in the Beijing Internal Combustion Engine Factory, it was concluded that TQM could be effectively implemented in China. Thus, the experiences of TQM implementation were then popularized and disseminated to other firms. In order to encourage firms in implementing TQM, the State Economic Commission issued the Provisional Regulations on TQM Implementation in Industrial Firms in March 1980. The provisional regulations, which integrated TQM theory with Chinese national specific conditions, stipulated the significance, role, and implementation method of TQM. In order to help firms implement TQM, a large number of training courses and seminars were organized by the quality control associations at various levels². The statistical data in 1985 showed that 38,000 firms implemented TQM while 500,000 QC circles were established in various firms. Today, there are tens of thousands of firms that have implemented TQM, which has been implemented not only in state-owned firms but also in collective and township firms, not only in industrial firms but also in service firms.

² China has different levels of quality control associations such as state, ministry, province, municipality, and county.

In fact, TQM was not well defined in China, but was still an ambiguous concept. However, the major TQM implementation practices in Chinese manufacturing firms could be summarized as: Using various kinds of quality management tools such as the QC seven tools and statistical process control in practice; implementing QC circles activities; analyzing and identifying quality-related costs; emphasizing quality inspection; establishing quality bodies (e.g., TQM implementation offices) in manufacturing firms; conducting quality audits; strengthening process control and improvement, product design, and after sales services. In the meantime, many people working in firms accepted education and training on TQM.

Over the past several years, China has become a focus of interest for Western organizations and management researchers, along with the awareness of the important role it has played in the global economy. Accordingly, more and more researchers have been involved in conducting research projects in relation to China in various fields, such as culture (e.g., Adler et al., 1989), organizational studies (e.g., Shenkar and von Glinow, 1994), technology transfer (e.g., Tackaberry, 1998), and marketing (e.g., Fock and Woo, 1998). Research on China's TQM domain, however, has not attracted much attention. As a result, little research has been conducted in this field, especially on TQM implementation at the firm level. Table 1.2 lists main articles published in international journals before 1996, dealing with general China's quality management.

Table 1.2 Articles Concerning China's Quality Management Appeared in International

Journals Before 1996

- Stephens, K.S. (1989), China's emerging quality emphasis, *Quality Progress*, December, pp. 56-61.
- Liu, D.X. and Willborn, W. (1990), Quality improvement in China, *International Journal of Quality & Reliability Management*, Vol. 7 No. 5, pp. 27-33.
- Chou, Y., Chang, P.L. and Tuan, C. (1993), Total quality control Chinese style and its management implications - Taiwan versus China, *Total Quality Management*, Vol. 4, No. 3, pp. 283-303.
- Liu, Y.Z. (1994), TQM in the socialist market economy of China, *Asia Pacific Journal of Quality Management*, Vol. 3 No. 3, pp. 36-44.
- Barad, M. (1995), Some cultural/geographical styles in quality strategies and quality costs (P.R. China versus Australia), *International Journal of Production Economics*, Vol. 41, pp. 81-92.
- Zhao, X.D., Young, S.T. and Zhang, J.C. (1995), A survey of quality issues among Chinese executives and workers, *Production and Inventory Management Journal*, Vol. 36 No. 1, pp. 44-48.
- Tang, C.L. and Tummala, V.M.R. (1996), The PCB industry in Hong Kong and China: A 14-step implementation strategy for ISO 9002 certification, *International Journal of Quality & Reliability Management*, Vol. 13 No. 2, pp. 99-113.

The existing Chinese literature³ related to the TQM showed that there are three main streams of published Chinese articles. First, a number of articles were published dealing with institutional policies. Such articles mainly discussed what kinds of governmental quality policies should be drawn up in order to encourage Chinese firms to emphasize quality management, implement TQM, and improve product quality. Second, some articles reported the specific experiences of implementing TQM in firms. These articles generally discussed the benefits, importance, and methods of implementing TQM in firms. These writers adopted case study research methodologies in their studies. Third, a few articles addressed how to use specific quality tools (e.g., the seven QC tools, statistical process control, experimental design, and quality function deployment) in practice.

Although many Chinese manufacturing firms began to implement TQM in the late 1970's and early 1980's, to date no large-scale empirical survey has been conducted to study the effects of TQM implementation on overall business performance in Chinese manufacturing firms. In addition, no research has been conducted about the confusion of TQM concept and TQM effects. Furthermore, no research has been conducted for developing a TQM implementation model that can be used by Chinese manufacturing firms to improve their TQM implementation efforts. The lack of sufficient guidelines to assist firms' TQM implementation has contributed to a number of unsuccessful TQM implementations in China.

1.3 Research Objectives

Based on the current TQM implementation in Chinese manufacturing firms, this research aims at achieving the following research objectives:

- To obtain the effects of TQM implementation on overall business performance in Chinese manufacturing firms;
- To obtain a TQM implementation model for Chinese manufacturing firms.

Thus, new knowledge related to TQM implementation in Chinese manufacturing firms can be derived. In this research, new knowledge is generated from existing TQM knowledge integrated with specific characteristics of Chinese manufacturing firms. After reviewing the existing TQM literature, it has become very clear that this research project is the only one that systematically examines the effects of TQM implementation in Chinese manufacturing firms. In addition, this research attempts to develop a TQM implementation model that can be used by Chinese manufacturing firms.

³ The reviewed literature was mainly from the Journal of Quality Management, which is an authorized journal in the field of quality management in China. The Journal of Quality Management is organized by the China Quality Control Association. In June 1996, the journal was renamed the Journal of China Quality. Part of the reviewed literature was from the Journal of China Conformity Assessment, which was initiated in 1994.

1.4 Research Questions

Based on the research objectives, the extensive literature review, brainstorming sessions with the author's promoters, and informal talks with quality practitioners, five research questions have been proposed. They are listed as follows:

Question 1: What is TQM?

Question 2: What is overall business performance within TQM?

Question 3: What are the effects of TQM implementation on overall business performance in Chinese manufacturing firms?

Question 4: What kind of TQM implementation model should be developed in order to guide Chinese manufacturing firms in implementing TQM?

Question 5: How can this TQM implementation model be demonstrated in practice?

1.5 Structure of the Thesis

Chapter 1 gives a brief description of the research.

Chapter 2 describes the concept of TQM based on the literature from the five quality gurus (Deming, Juran, Crosby, Feigenbaum, and Ishikawa), the three quality award models (the Deming Prize, the European Quality Award, and the American Quality Award), and others conducting research in the field of TQM. Thus, the concept of TQM is defined and the research question "What is TQM?" is answered.

Chapter 3 identifies the four constructs of overall business performance. Thus, the research question "What is overall business performance within TQM?" is answered. Based on the literature review, two theoretical models linking TQM implementation and overall business performance are developed. One is the model of TQM implementation and overall business performance, which has nine hypotheses. The other is the model of TQM implementation constructs and overall business performance, which has 17 hypotheses. Finally, this chapter describes how to operationalize these theoretical constructs.

Chapter 4 presents the methodological perspectives of this research. The strategies adopted in this research are discussed in greater detail. The issues of how to develop the research questionnaire and structured interviews, how to conduct the questionnaire survey and structured interviews, and how to conduct the case study are described in this chapter.

Chapter 5 presents the evaluation of measurement instruments. In the questionnaire survey, there are two instruments used for obtaining information from Chinese manufacturing firms, one to measure TQM implementation and the other to measure overall business performance. The instruments for measuring TQM implementation and overall business

performance are empirically evaluated for their reliability and validity using data from Chinese manufacturing firms.

Chapter 6 describes the method used for testing the two theoretical models hypothesized in this study, the results of the model testing using data from Chinese manufacturing firms, and the interpretations of the model testing results. Ten structured interviews conducted in Chinese manufacturing firms are used to help the author interpret the questionnaire findings.

Chapter 7 presents the development of a TQM implementation model. This model is developed based on existing TQM knowledge, the results of the questionnaire survey and the structured interviews in Chinese manufacturing firms, and the specific characteristics of Chinese manufacturing firms. The use of this model in practice is also addressed in this TQM implementation model.

Chapter 8 provides an example of using this TQM implementation in practice. This is realized through conducting a case study in a Chinese state-owned manufacturing firm.

Chapter 9 presents a brief summary of the research and the main conclusions with respect to the new knowledge derived from this research. The limitations of the research and issues requiring further study are also addressed.

