Review Relationship TPM as mediator between TQM and Business Performance

Y. Ngadiman 1, A.H Nor Aziati2, Abdul Talib Bon3, Ahmad M.F 4, Raja Zuraidah Raja Mohd Rasi5
Department of Production & Operation Management
Faculty of Technology Management

1yunos@uthm.edu.my, 2aziati@uthm.edu.my, 3talib@uthm.edu.my, 4mohdfauzi@uthm.edu.my, 5rzuraida@uthm.edu.my

Abstract. In today’s highly competitive market, the demand for quality is the single most critical factor for companies to survive in the ever-expanding global marketplace. Total Quality Management (TQM) has been developed as a result of intense global competition. Most of the previous works show that TQM has significant relationship with business performance. However, the examining of moderators is less given in previous work, which mediators are known generally as general tools and techniques without specific focus on types of improvement. The purpose of this paper is to propose relationship between TQM practices and business performance with mediators effect of Total Productive Maintenance (TPM) based on extensive review of the literature. The main contribution of this paper is to identify the relationships among TQM, TPM practices and business performance as a conceptual model. This proposed conceptual model will help the academicians and industry players to have better understanding on the relationship between the practices.

1 INTRODUCTION

The concept of total quality management (TQM) has been developed as a result of intense global competition (MFB. Ahmad & Yusof, 2010; MFB Ahmad et al., 2008; Garvin, 1988). According to Garvin (1988), international competition requires higher levels of quality achievement to meet the customer satisfaction. TQM is a management philosophy that helps manage their organization to improve the effectiveness and performance to achieve world class status for the past two decades (M. F. Ahmad et al., 2012; M. F. Ahmad et al., 2014; Konecny & Thun, 2011). However, the study of mediators is neglected and is referred to less frequently in literature review. The fundamental systems-interactive paradigm of organisational analysis features the continual stages of input, processing, and output, which demonstrate the concept of openness and closeness. Processing is the process of changing from one “look” to another, or one culture to another (Rouse, 2005; M.F Ahmad et al., 2014). In this study, the author defines input as TQM; processing as application tools and techniques namely TPM; and output as business performance. Thus, one of the objectives of this study is to empirically analyse the impact of TPM between TQM and business performance.

1.1 Literature Review
The first mediator that will be examined is total productive maintenance (TPM). The purpose of TPM is to minimise breakdown and to maximise equipment availability of production systems at minimal cost (Hans, 2000; Nakajima, 1988). TPM started in Japan in 1971 (Abdallah, 2013; Abdallah & Matsui, 2007). The word “total” means total effectiveness, total maintenance system, and total participation of all employees (Nakajima, 1988). On the other hand, preventive maintenance is a routine inspection to detect potential failures and to make minor adjustments or repairs that will prevent major breakdown maintenance at a premium cost (Konecny & Thun, 2011). Thus, TPM can be defined as an improvement programme that establishes a comprehensive productive-maintenance system throughout the entire life of the equipment with the participation of all employees through voluntary team-based activities (Dal et al., 2000). Furthermore, TPM can also be defined as an approach to achieve improvement of production processes by involving and empowering production employees, and by introducing an ongoing process improvement (Nakajima, 1988). The Japan Institute of Plant Maintenance (JIPM) defines TPM as maximising equipment effectiveness with a total system of preventive maintenance covering the entire life of the equipment involving everyone in all departments and at all levels (Imai, 1986). The Western definition of TPM is the philosophy in which all equipment in production are always kept in optimum condition and available for maximum output (Peter, 1994).

3.0 Methodology

An extensive literature search was designed to identify and retrieve primary empirical studies relevant to develop the hypotheses. The databases searched were Springer-Link, Emerald, Taylor & Francis, ScienceDirect, Elsevier, ProQuest and Google Scholar. The descriptor TQM and environment effect were used when possible; otherwise, it was searched as a keyword.

4.0 Hypotheses

H1: Relationship among TQM, TPM, and Business Performance

Most previous studies indicate a significant relationship between TQM practices and business performance (Jun et al., 2006; Bou & Beltrán, 2007; Gunday et al., 2011; Miyagawa & Yoshida, 2010; M. F. Ahmad et al., 2013). In contrast, other studies show that TQM does not improve business performance (Corredor & Goñi, 2011; Demirbag et al., 2006; M. F. Ahmad et al., 2013). Other findings show partial correlation between TQM practices and business performance (Demirbag et al., 2006; Feng et al., 2006; Arumugam et al., 2008). Accordingly, the author proposes that:

H1: TQM practices are positively significant and have direct effects on business performance.

TPM is significantly supported by TQM for improving business performance (Konecny & Thun, 2011; Ahmad M.F., et al., 2014). Teeravaraprug et al., (2011) suggest that TQM and TPM should be implemented before lean production. Two sets of factors are critical for the effectiveness of TQM and TPM: (1) universally signifi-
cant factors for all three approaches such as leadership, process management, and strategic planning; and (2) approach-specific factors such as equipment management and focus on customer satisfaction (Seth & Tripathi, 2005). TPM is comprehensive improvement originating from the concept of zero defects of TQM, which applies to control equipment performance (Seth & Tripathi, 2006). Teeravaraprug et al., (2011) reveals that TQM practices such as 5S, QC tools and Kaizen have significant impact on TPM. Abdallah (2013) indicates that TQM practices such as top management leadership, customer focus, training and continuous improvement have significantly impact on TPM implementation. Thus, TQM practices are positively correlated with TPM.  

**H2a: TQM practices are positively significance and direct effect on TPM.**

Ahuja and Khamba (2008) note the critical success factors of TPM, such as top management leadership and involvement, maintenance practices, as well as holistic TPM initiatives, enhance business performance in Indian industry. Konecny and Thun (2011) indicate that TQM and TPM supported by human resource practices significantly improve business performance. Ahmad et al., (2012), Brah & Chong (2004) and Nakajima (1988) indicate that TPM practices have impact on business performance. Therefore, TPM practices are positively correlated with business performance. Accordingly, the author proposes that:  

**H2b: TPM practices are positively significance and direct effect on business performance.**

There are lack of empirical evidences of TPM as mediator between TQM and business performance in previous work (Sadikoglu & Zehir, 2010). In this study, TPM acts as mediator between TQM and business performance. TQM provides soft and hard aspects such knowledge, skill, continuous improvement and work environment and culture to support adoption of TPM implementation (Konecny & Thun, 2011; Teeravaraprug et al., 2011). Meanwhile, TPM has positively impacts on business performance (Ahuja & Khamba, 2008; Brah & Chong, 2004; Nakajima, 1988). Thus, TQM will be helpful for effective and efficient in TPM adoption, in turn increasing business performance. Accordingly, the author proposes that:  

**H2: TPM is a mediator between TQM and business performance.**

### 4.0 Conceptual Framework
Structural equation modeling (SEM) techniques are utilized to examine the relationships. Based on a comprehensive review of previous studies, a conceptual model has been proposed to understand the relationships as presented in Figure 1.

![Figure 1: Proposed conceptual model of TQM with mediators of TPM](image)

4.0 Conclusion

The main objectives of this study are to investigate the relationships among TQM, TPM and business performances as a conceptual model. 3 hypotheses regarding the relations among TQM, TPM and business performance have been specified and conceptual framework have been proposed for future work.

Acknowledgement

The authors would like to thank Universiti Tun Hussein Onn (UTHM) for its support in this project.

References


