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The Influential Factors of TQM and TPM Implementation on Manufacturing Industry Performance (MIP)

Abdalla Al Maazmi[1], Abdallah Al Hamadi[1*]

[1]Department of Engineering Management,
University of Sharjah, Sharjah, 27272, UNITED ARAB EMIRATES

*Corresponding Author

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Abstract: The demand for quality is the one crucial factor for businesses in today's highly competitive market, to thrive in this ever expanding global market. As a result of intense global competition, Total quality management (TQM) has been created. Most of the previous papers show that TQM is very related to business success. However, the analysis of the Total productive maintenance (TPM) as mediator between TQM and MIP not widely found and previous researches were commonly regarded as general instruments and techniques without particular emphasis on improvement styles. This paper aims to suggest the relationship between TQM and MIP through mediating impact of TPM. The methodology adopted for this research was to use a review of existing literature, this paper explores the theories of TQM and TPM to provide useful information to ensure effective management of manufacturing industry. The key contribution of this paper is to develop a conceptual model to describe the cause-effect relationship between TQM, TPM activities and MIP. The implication of the proposed conceptual model would help academics and policy makers in the industry to better understand the relationship between activities.

Keywords: TQM, TPM, influential factors, industry performance

1. Introduction

Due to intense global competition, TQM concept has been developed. The industry in the UAE faces heavy competition as a leading production base on the world market amongst global players. In the current scenario, the organisational skills of many companies are strengthened by different strategies like TQM and TPM in a competitive environment. In TQM, organisations, by constantly developing strategy, have used such statistical and management methods to strengthen the organisational capabilities [1],[2],[3]. In fact, TQM is a joint effort among managers, employees, workers, suppliers and dealers to achieve the satisfaction level and to exceed customers' expectations and satisfactions. TQM also makes a continued effort on the part of employees to improve the quality of their products and services continually through input from their customers [4]. In reality, TQM is a collaborative initiative between management, employees and suppliers to achieve and surpass a level of customer satisfaction. In order to fulfil the requirements of clients and the organisational goals TQM seeks to integrate all organisational activities such as marketing, efficiency, finance, architecture, engineering, development and customer service). TQM boosts not only corporations' economic efficiency, but also enhances employee morality and skills [5].

A number of researchers have emphasised several factors that are important for an effective deployment of TQM implementation in any organisations such as leadership engagement, employee involvement, financial resources, suppliers, connectivity, consumer orientation, process approach [6]. While attempts have been made to encourage industrial growth, a great deal needs to be achieved through cost control, quality enhancement and more diverse goods and better services. These quality and maintenance programmes are the consequence of the need to ban wrong practices, because clients demand affordable quality goods. An additional quality fee that producers cannot disregard is now

*Corresponding author: aa32aa@gmail.com

charged to a wide medium community of approximately 300 million customers particularly in the face of multinational firms. Drug competitiveness and the need to develop a global supply base have driven UAE leaders to initiate high-quality initiatives. Initially, UAE managers paid little attention to equipment-related failures and losses due to their secure and regulated economies. Maintenance was seen as a reactive solution to problems and as minimizing running costs. But increased demand from customers to minimise prices, errors and lead time has forced management to pay attention to maintenance and related problems through adjustments such as TPM. Management in the UAE now considers TPM as an investment like TQM, not a loss. It helps to overcome shortcomings and efficiency shortcomings at low cost. In comparison, TPM is regarded as an extension to machinery of TQM principles with zero disturbances and minimal losses in performance. In several companies these two additional drives were introduced together to improve the capacities of both companies which are TQM, with TPM. This form of research work is urgently needed in the growing concern to improve the performance of these initiatives in the context of the UAE, while these experiments in other countries were carried out for both TQM and TPM, but analysis did not properly discuss the simultaneous implementation of two drives. This research is therefore also relevant from a global point of view. Since the TQM and TPM have a similar context, some factors for all approaches are likely to be general, while others may be unique. Some factors that are otherwise not important can be emphasized by the difficulties involved in handling two drives together. Understanding the relationship between TQM and TPM variables becomes increasingly important in combination with TQM and TPM. This kind of research is extremely relevant for other countries as well as not just in the sense of development economies like the UAE. TPM Values include: scheduled maintenance; targeted enhancements; self-support; growth management; TPM office; education and training; quality maintenance; and protection, health and the environment.

International competition needs a higher degree of quality output to satisfy customers [7]. TQM is a management philosophy which helps its organisations to improve performance in the past two decades in order to achieve a world-class status. However, a dearth of research is found in analysis of TPM as mediators, in the literature review. The system-interactive fundamental model of organisational analyses features ongoing phases of input, processing and output, demonstrating the principle of transparency and closeness. The paper describes input as the TQM; treatment as tools and techniques for application, namely the TPM; and outputs as MIP. One of the aims of this study is to empirically analyse the significant TPM influences between TQM and the MIP. Strategic planning is required for implementing TPM. However, almost no research has been carried out in this field, particularly in the Middle East and in the UAE context.

1.1 Literature Review

Many studies on the relationship between TQM practices and business results are available. The mechanism to research TQM's impacts on corporate performance was developed [8],[9]. Several of the recent studies worldwide have also concentrated on identifying factors that are important to the TQM's success in a particular country scenario [10]. Seth and Tripathi (2005), for example, conducted an empirical study to identify factors that are key to TQM's performance in the Australian manufacturing industry [11]. The study demonstrated the value of factors such as leadership, consumer attention, quality processes and knowledge availability. In the UAE TQM studies, the critical problem of the connection of implementation and business performance was not discussed. These studies concentrate on defining and benchmarking quality control practices among UAE companies [12],[13],[14]. Though Trang and Do (2020) tried to identify key factors for the implementation of TQM based on five manufacturing sub-sectors, their output relation was not studied [15]. Moreover, only a few studies on TPM implementation in the context of the UAE have been available up until recently. The research focuses on the overall industrial TPM scenario, implementation problems and business case studies. In several businesses, the complementary existence of the TQM and TPM as experts pointed out is used for synergy, but this is not a comprehensive matter but only for a small amount of studies. An empirical analysis of these questions is therefore essential in the UAE context. It does not only boost the efficiency of two drives, it also covers an important yet under-researched area. TPM would be the first mediator to be considered. TPM aims at minimizing the loss and optimizing the availability of manufacturing device equipment, at a low cost [16]. TPM is, on the other hand, a regular inspection to identify possible faults and make minor changes or fixes that avoid major maintenance breakdowns at an additional expense [17]. TPM can thus be described as a programme for improving the production and maintenance of equipment over the entire lifespan, with the participation of all employees in voluntary work by teams. In addition, TPM can be described by involving and improving production staff and implementing a process improvement as an approach towards achieving better production processes. TPM is characterized as maximizes equipment efficiency by the Japan Institute of Plant Management (JIPM) with a complete preventive maintenance scheme covering the entire period of all the equipment involved in all departments and at all levels.

2. Research Methodology and Conceptual Model Development

A concept may be described as a group of objects or abstracts which can identify, indicate and reach a thing for human minds [18]. It is better to grasp the word definition if it has a name, if there is no comprehension of names or

reference, such as events, professional justice and so on. Carey (2009) described the term as the psychological symbols as well; hence concept theory is regarded as part of a picture-theory and a true image of what mind-symbols think is to be predicted [19]. However, the term description can take different shapes depending on the subject. Concept studies cover anthropology, cognitive, neurobiology, intellectual history, linguistics, philosophy, psychology, sociology etc. The methodology adopted for this research was to use a review of existing literature, this paper explores the theories of TQM and TPM to provide useful information to ensure effective management of manufacturing industry in order to perceive constructive and/or reactive approaches to help the policy makers to predict the industry performance. A systematic literature review has been undertaken to locate and find key research studies to establish hypotheses. Figure 1 presents the developed conceptual model containing a TQM and TPM as independent variable and mediator respectively and MIP is the dependent variable. The goal is to draw out these factors for each approach which contribute significantly to the performance improvement of the manufacturing industry, explaining the link between implementation factors and TPM performance parameters. Both basic factors (independent variables) and parameters for MIP (dependent variables) are needed for such research. These dimensions reflect unified groups of different TQM and TPM implementation issues.

The advantages of TQM leads to better goods produced at lower cost. The emphasis on using high quality information to improve processes reduces waste and saves time, leading to decreased costs that can be passed along to clients in the form of lower prices. Entertaining the continuity of consumer satisfaction, businesses that effectively adopt TQM will reduce the variability. Customer satisfaction is built and the company continues. The emphasis on participation at all levels leads to the involvement of staff, which decreases sales and saves on education and errors due to inexploration.

From the other hand, the disadvantage, it requires deep commitments. The need for an overall commitment to changes in quality and the difficulty in meeting that commitment is one of TQM's key drawbacks. In order to be genuinely effective, all levels of management should be on board. Any lack of commitment or resources is a negative influence in the organisation, undermining the performance of the TQM programme. If the management fails to implement a TQM programme in full, it will undoubtedly make a partial effort. For example, merely restricting the initiative to staff training without using statistical methods to assess and analyse improvements in procedures would generate confusion and insufficient performance. Evaluations and calculated results should allow a full circle of training programmes. One reason some organisations concentrate on training is that what has been done can be observable and easily shown. However the expertise and abilities they have will be unlikely to stay unless training is continued.

3. Hypotheses Development

Relationship between TQM, TPM and business performance recent studies have shown that there are important relationships in business performance and TQM activities as indicated in previous research [20],[21],[22]. Other research, however, indicate that the performance can’t be improved by TQM [23],[24]. Other results indicate that TQM activities and market performance have a partial association [25].

TQM activities have a positive impact on company results and have a direct effect. In order to boost market efficiency TPM has substantial support from TQM [26]. Two sets of elements are important to the performance of TQM and TPM such factors that are common to all three approaches, such as management of leadership, procedure and strategic planning; and particular approach factors like the management of equipment and customer satisfaction. TPM is an extensive improvement based on the TQM null defect principle which is applicable to the efficiency of control equipment. Abdallah (2013) shows the important effects on TPM adoption of TQM activities, such as leadership, emphasis on clients, training and quality improvement [27]. Hence, the activities of TQM are therefore well connected to TPM.

H1: there is a substantial relationship between the TQM and MIP

Constructive importance and direct effects of TPM are TQM activities. Top management leadership and participation, maintenance activities, as well as holistic TPM programmes are key drivers of TPM's success, such as increased market performance in the Indian industry. Konecny and Thun (2011) point to the dramatically improved performance of TQM and TPM enabled by human resources activities [26].

H2b: The TPM activities have a positive influence on organisational efficiency and direct effect.

H2: there is a substantial relationship between the TQM and TPM

TPM as the mediator between TQM and the success of businesses in previous work is not empirically documented. TPM serves as a mediator for TQM and business success in this report. In order to encourage adoption and implementation of a TPM [26], TQM offers soft and harsh areas such as information, skills, ongoing development and

working climate and culture. In the meantime, TPM's effect on market results has been positive. In TPM adoption, TQM would thus be helpful to boost productive and efficient business efficiency in turn.

H3: there is a substantial relationship between the TQM and TPM

The path diagram of the developed model or framework is presented in Fig. 1 which shows the components in the constructs within the framework. Fig. 1 shows the model which are independent and mediator variables of this research named as: TQM and TPM while the MIP is the dependent variable of the proposed model.

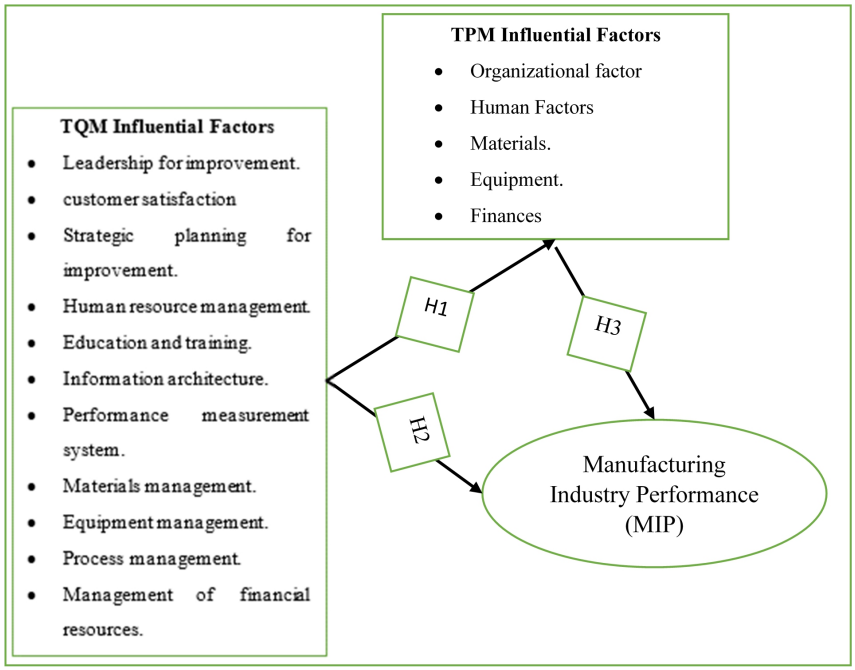

Fig. 1 - Conceptual model for cause-effect relationship between TQM and TPM on MIP

3.1 Recommendations for Future Research

The proposed conceptual model can be validated by hypothesis testing using empirical study by collecting data from manufacturing industry experts. Structural equation modeling (SEM) techniques can be utilized to examine the relationships between TQM, TPM and MIP to analysis the confirmatory factor analysis by measurements model. Hypothesis's testing can be validated by structural model to test the cause- effect relationship between TQM, TPM and MIP.

4. Conclusion

Several scholars and researchers have written with so many different scientific reasons on the problems of the production sector in general and on its administration and realization. However very few if any, took a holistic approach to the understanding of the successful impact between TQM and TPM into consideration as big as those reports. The main aim of this paper is to identify the Influential Factors of TQM and TPM Implementation on MIP. It is clear that this strategy does not always produce such planned results from certain stakeholder growth activities. Among other items, the drawback of this paper is the inability to present the empirical research report along with the current paper. This is in reality a chance for future study which the authors intent to conduct a case study on a specific manufacturing firm in UAE. The policy implications of this study are that it will boost the efficiency of the production sector and provide new possibilities for future studies. The hypotheses concerning the relationships between TQM, TPM and corporate performance were stated and for further work the conceptual structure was suggested. It is very reasonable that both TQM and TPM concentrate on process management in manufacturing industry sectors. TQM and TPM can affect both the external performance of products and services for the consumer and the internal performance of the environment which can be considered as a research point for future work.

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