



## **Total Quality Management (TQM) and Knowledge Management - A Review**

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### **Abstract:**

This research study seeks to come up with a conceptual framework that investigates the different dimensions of total quality management (TQM) and its effects on knowledge management (KM). This is to help build a theoretical framework of TQM and its dimensions, which mainly consists of leadership, strategic planning, information and analysis, process management, human resource focus and customer focus. These constructs are rooted in the work of Malcolm Baldrige National Quality Award (MBNQA). The current research study is based on the complete assessment of present literatures, the six constructs of TQM and the three elements of knowledge acquisition, knowledge application and knowledge dissemination. This paper serves as a guide to senior management, who seeks to improve their company's organizational knowledge management activities through the execution of TQM practices, in which the TQM practices support their company's knowledge management efforts. Furthermore, the conceptual model serves as a benchmark for practitioners to execute their TQM programmes more effectively and efficiently in their own respective firms. By developing a deeper understanding of the relationship between TQM practices and knowledge management, senior management can thus focus their efforts on the practices that ensure the firms' ability to establish a competitive knowledge management capability.

**Keywords:** Total quality management, knowledge management, Malcolm Baldrige National Quality Award.

### **Introduction:**

For the past two centuries, the introduction of Total Quality Management (TQM) on both practical and theoretical levels has played an important role on the growth of management practices [1-3]. The definition of TQM defined by Lin and Ogunyemi (1996) is an all inclusive business management beliefs, which consists of a set of guiding principles that exemplifies the foundation for continuous improvement and hence it is acknowledged as the most 'holistic' approach offered to date in sustaining the efforts for organizational improvement.

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TQM is characterized as one of the most important topics in operations management research [4] and it is well known. It plays a vital role in giving firms a sustainable competitive edge when it is implemented successfully [3]. Examples quoted by previous researchers in their studies have emphasized how the implementation of TQM practice enabled many companies to attain a sustainable competitive edge [5], to participate in the global arena competitively [6-7], leading to the upgrading of operating performance [8], which is associated with market orientation [9]. Knowledge Management (KM) has developed into different areas in the study of firms and is alleged to play an important part in attaining sustainable competitive advantage in the present day business and academic arena [10]. In addition, KM can also be described as “covering any intended and methodological process or put into practice the knowledge of acquiring, capturing, sharing and using knowledge, wherever it resides in, to improve the learning capability and performance of firms” [11]. In spite of the large body of literature in TQM, there is still insufficient systematic experimental evidence with regard to the degree of TQM practices and its result on knowledge management (KM) behavior, despite the importance of their relationship within the firms.

It was proposed that by managing TQM well and to achieve KM behavior purposely and tactically, are vital in helping a firm achieve a competitive advantage [12]. In addition to that, it was concluded that these two facets play as one major role in maintaining the development of an organization [13]. For an organization to survive and succeed, it is crucial to manage TQM well and to attain KM holistically, both in terms of theory and practicality [13-14]. In addition, the theoretical base is helpful to clarify the relationships in TQM in the literature, which is vital for achieving a competitive edge for firms. To close the gap in the existing literatures and to provide practical help to manage the effects of TQM on KM, this paper propose a set of TQM practices and furthermore, to come up with a conceptual model that could shed some guidance on the implementation of TQM. Given the above reasons, this paper will investigate the past literature and then supplement this work by investigating each TQM practices and their relationship with knowledge management behavior. The other sections of this research paper are structured as follows: In the next section, the theories laid down in the literature of key practices of TQM and knowledge management are discussed. The literature review emphasizes on how certain TQM practices are related and present the propositions and then followed by the proposed conceptual framework. Finally, the conclusions with respect to the new knowledge from this study are discussed followed by limitations of the study, implications, and recommendations for future research.

### **Key Practices of TQM:**

Several efforts have been done to prove the elements of TQM in the past decade [6]. According to prior TQM research, the constructs of TQM has been categorized in a few ways, even though they complement each other [3]. There is no clear agreement of TQM research concerning its key elements that show the capabilities of what TQM portrays when referred [15]. Hence, there arises a difficulty of reaching an agreement on the elements of TQM due to the inconsistency in the previous research [2]. A complete assessment of TQM literature have shown that TQM practices could be secured in seven areas, being leadership, strategic planning, customer focus, information and analysis, human resource management (HRM), process management and supplier management. A huge amount of previous literatures that confirms the practices of TQM theoretically and practically is mainly based on the criteria of Malcolm Baldrige National Quality Award. The constructs embedded in the TQM practices are leadership, strategy and planning, customer focus, information and analysis, people management and process management [3]. However, it was argued that their model includes the Malcolm Baldrige National Quality Award (MBNQA) criteria that have been acknowledged as representing TQM practices by several scholars [6]. These practices are also consistent with the standard of the Malcolm Baldrige National Quality Award (MBNQA) as implied [16] and examined the TQM practices taken out by 76 empirical TQM analysis and categorized them under 2002 MBNQA model [16]. Furthermore, by putting into effective practice the MBNQA criteria, it will enhance economic performance. Through the comprehensive examination of past research, which includes the criteria of the most esteemed quality award such as MBNQA (1999), six dimensions of TQM practices were formed to signify the main TQM practices in this research study as shown in Table 1, for three most important reasons [2]: (a) Integrate the most well-recognized quality award criteria of leadership, customer and market focus, information and analysis, strategic planning, human resource and people management – extensively

acknowledged by TQM researchers and practitioners; (b) Comprise the constructs that signify the soft and hard facets of TQM conferred in the literature and (c) Have been regarded as key practices of TQM implementation in both manufacturing and service industries by past researchers and scholars.

### **Knowledge Management:**

Many definitions regarding knowledge management (KM) can be found in literature written by famous scholars [13-14]. It is essential to understand the definition of knowledge before having a better understanding of KM. Knowledge is a comprehensive concept with profound meanings, bearing the belief that it increases an organization's ability for effectual action. Knowledge can be further divided into two that is, tacit knowledge and explicit knowledge. Tacit knowledge is defined as one that is inherent inside an individual and it is acquired through imitation and practice [17]. On the other hand, explicit knowledge is defined as a data which is either technical or in academic terms or information that is written in a formal language. Furthermore, explicit knowledge can be further articulated in the form of rules, guidelines and principles [18]. Four different forms of knowledge conversion were mentioned which includes socialization, externalization, combination and internalization [18], in which the model explicitly describes the conversion of knowledge being a spiral and continuous process between the interactions between explicit and tacit knowledge. KM is defined as a methodological method that enhances the capability of a company to assemble and organize the knowledge in order to improve the decision making ability and business strategy formulation process [14]. Furthermore, KM is termed as a process for knowledge creation and manages the distribution and sharing of knowledge within and between each organization [19]. However, this definition of KM portrays that KM is made out of three main sections, which are knowledge acquisition, knowledge dissemination and knowledge responsiveness [19]; whereas KM incorporates only two parts, namely knowledge acquisition and knowledge dissemination. From the process point of view, KM consists of knowledge creation, knowledge retrieval, and knowledge sharing and knowledge application [20]. Based on the statements given above, KM behaviour covers the acquisition of knowledge, the dissemination of it as well as the application. These three constructs of knowledge have soon become the major concepts of KM, whereby each construct of KM is presented as dependent on the other components. In other words, knowledge is acquired, distributed and then comes the application part.

### **Propositions between TQM and Knowledge Management Behaviours:**

#### **Leadership:**

Leadership is described as a link through which one individual have control over the performance and conduct of other individuals [21] to attain a company's objectives. In addition, the empirical studies concluded that "in the context of TQM, leadership is not so much about power, authority and control, but more of empowerment, recognition, giving guidance and developing others". Hence, one of the most effectual methods for leaders to fuel the energy of a group is to be creative in allowing the group to innovate [22]. Given the existing situation of firms, where its focal point are mainly knowledge based, TQM needs a change in the main organizational elements, in particularly the leadership styles. In addition, management leadership could add tremendously to the core competency improvement and skills in the course of their role being helpers of organizational learning in the workplace, in particularly by helping to cultivate a knowledge management behaviour environment in which employees are encouraged to apply their inferred and tacit knowledge to solve problems that arises. Many studies have confirmed that senior managers play an important role to control the rate of success for KM activities [23] as well as enhancing the process of managing organizational process.

Furthermore mentioned that mission, motivation, systems and structures design for the various activities of a company that supply the means to trade knowledge should come from management leadership. The senior manager's role as a helper in supporting the practice of knowledge management in teams, namely knowledge acquisition, knowledge dissemination and knowledge sharing is vital for the development and enhancement of collective learning ability in organizations [24].

Management leadership should portray good examples by freely contributing their knowledge, enlightening the significance of KM to other workers and developing culture that encourages the sharing and creation of knowledge. In other words, it is vital for management leadership to make this situation effective for KM [23]. Apart from that, it has also been widely known and established by both researchers and practitioners that leaders play a vital role in creating and maintaining a favorable knowledge management environment [24].

**Table 1. The six dimensions of TQM practices with their explanations.**

Constructs	Explanations	Reference
Leadership and top management commitment	The degree of visibility and support that management provides in implementing a total quality environment is significant to the success of TQM adoption.	[3, 6, 25, 27]
Customer Focus	To have well satisfied customers is one critical objective. Develop and manage strong customer relationships for the longer term. Know the customers' current needs and future expectations.	[2-3, 8, 26, 29]
Strategic Planning	The degree to which the organization has a clear vision, mission, long-term plan and quality policy.	[3, 29-30]
Information and Analysis	The degree to which data and information to be collected and analyzed for the aim of quality improvement.	[3, 16, 28, 29]
Process management	Emphasizing adding value to processes, increasing quality levels, and having program to reduce wasted time and costs in all internal processes.	[30-31]

Moreover, the support given by management leadership should be continuous and be conveyed in a practical manner and such support could then be converted into intensive efforts that would contribute to KM success [32]. Hence, the following proposition is given: **P1: Leadership is positively related to knowledge management behaviours (i.e. knowledge acquisition, knowledge dissemination and knowledge application).**

### Strategic planning:

Strategic planning has been categorized as activities which are conducted both socially and cognitively to obtain success and stay competitive in any sector. In the latest research it was found that the strategic planning, under certain conditions and circumstances, does contribute to the higher performance of an organization. The focal point of these criteria lies in the strategic planning and exploitation of plans of an organization, coupled with the organization's focus on key customers and operational performance requirements [26]. However, the another studies commented that the extent of a firm being competitive mainly comes from the special knowledge of its employees, the ability of a firm to create new knowledge and be innovative, and the strategic actions taken by the firm. Strategy points to where and the way in which an organization will be heading to in the coming years One of the main factors of KM success is to have a well thought strategy, as this strategy provides a foundation for how a firm can organize its capabilities and resources to attain its KM objectives. All efforts to associate KM programmes to strategic planning have become a vital source of competitiveness for all firms [33]. Related closely to the idea of strategy, is the formation of a convincing and shared vision for pursuing KM behaviours. It is essential that employees support and share this vision and trust that it will work. It was further commented that value hypothesis had to be clearly defined and stated so that passion to attain it can be created among management and employees. In short, before a significant investment can be made to instigate a KM effort, all the above fundamentals need to be carefully developed.

The American Productivity and Quality Centre (1999) made a study and concluded that firms running after different KM strategies have more success when the strategy employed is associated with their business strategic plan. Hence, based on this, for firms that wish to implement KM behaviours, it is essential to ensure their

knowledge program are consistent with the company's missions. Hence, the following is proposed: **P2: Customer focus is positively related to knowledge management behaviours (that is, knowledge acquisition, knowledge dissemination and knowledge application).**

### **Process management:**

Process management is defined as the behavioural and systematic principles that are important to manage process rather than the outcomes. It also points to the way how businesses strive to be successful by encouraging the need for knowledge innovation and creativity in process improvement and optimisation. Process management stresses on value adding to a process, increasing the productivity of every employee and enhancing the quality of the company [30]. The basic requirements of process management are to lower down costs, boost efficiency and reducing cycle-time, which all can be applied to KM behaviours [13]. There are several processes and performances that exemplify the KM discipline and that the literature stressed a few of the processes that are connected with KM. For example, adequate measures needed to be ready to ascertain that KM processes are addressed in an organized and structured manner. Hence, for the organization the way the KM process is to be implemented is vital [23]. The process management endeavours to execute process capabilities, ensuring consistent outcomes and customers' needs and expectations are met. Both quality and KM structure are assumed to be handled and controlled by the organization. Due to this perception, one can assume that firms adopting the process management approach will at the same time implement the structural approach to KM. However, the link between TQM critical factors and KM value chain activities, they found that knowledge storage can reduce the engineers' time for ASE Inc. in terms of knowledge distribution, searching time has been reduced and problem solving skills was further improved as the company rearranges all the documents orderly [13]. As for knowledge applications, in order to apply process management into it, reports on company's projects are made available to every employee. Furthermore, an effective process management will have an effect on quality performance. This could be attained by reducing process variation where quality performance is acquired, disseminated and shared. As process variance is being reduced, the chances of having defective parts will also reduce accordingly. However, the most significant matter in the link between TQM processes control and the internal knowledge transfer is the systematic use of control processes in a firm, which has an important part to play on the search for and transfer of knowledge to which they are applied. For firms that have put TQM into practice, it is widely known that TQM helps in the continuous improvement of processes, and this will direct such firms to seek and use the knowledge they need. Hence, the following proposition can be suggested. **P3: Process management is positively related to knowledge management behaviours (that is knowledge acquisition, knowledge dissemination and knowledge application).**

### **Human resource management:**

In the present knowledge based economy, people are regarded as the most important asset [34], in which it is widely acknowledged in the literature the significance of human aspects, such as providing training and compensation plans, from the perspective of TQM. In addition, both knowledge and human resources are being gradually looked upon as the main force of a multifaceted business environment. Furthermore, the people are the ultimate knowledge inventor and owners. This is supported by a statement made by Devenport and Volpel's (2001, p. 212), whereby they stated that "to manage knowledge is to manage people; to manage people is to manage knowledge". Numerous studies were done to survey the relationships between human resources and KM. Through the study of line managers and HR specialists and their structural positions in knowledge creation and knowledge sharing, both of them have explored the inferences for devising and executing HR practices in knowledge intensive firms. The results obtained has shown that the line managers are the main source to the knowledge networks and are considered to be the knowledge actors; whereas the HR specialists are not. As a result of this finding, it was concluded that in a knowledge intensive firm, the decentralised method is a more preferred way to HRM. This leads to the suggestion that HR practices are more focused on line managers and this can have a better effect on the knowledge creation and knowledge sharing process. In an interesting study, it was found that individuals often enjoy helping others and at the same time, to enhance self knowledge efficacy [17].

With the support from senior management and appropriate organizational rewards, it could further enhance the knowledge sharing process, which could then lead to superior innovation. In short, it is concluded that employees, in general, are willing to collect and share their knowledge and this would enable the company to encourage and cultivate a knowledge sharing culture, which would eventually lead to an increase in innovation performance in the firm [17]. Undeniably, many researchers have stressed the significance of HRM as one way to enhance knowledge transfer, in particular in the form of technology know how, due to the fact that HRM and KM have become more sophisticated and comprehensive [35]. Therefore, teamwork creates an image of sharing out the work, which in turn helps in the knowledge transfer within a firm. Taking into consideration of such matters, the following propositions have been formulated: **P4: Human Resource management is positively related to knowledge management behaviours (that is knowledge acquisition, knowledge dissemination and knowledge application).**

### **Information and analysis:**

In the present digital era, information plays an important part in the business operations. This component is used to emphasize the significance of data-base information, which is used to help in making more informed decisions [25, 28]. The Malcolm Baldrige National Award Criteria (1999) has mentioned that information and analysis lies within the “scope, management and the utilization of data and information, to maintain a good focus on customers, to strive towards a greater quality control and to improve performance of a firm”. In particular for firms that operate in the technology based arena and for those that find it difficult to stay afloat in the competitive marketplace, information is seen to be an important element for firms to improve and enhance their innovation process. Literature survey reveals, for a firm to stay competitive in the present global arena, it is essential that a firm know how to manage their information and knowledge [14]. Information and analysis are sensible elements of KM and can be applied to KM behaviours effectively [36]. According to several scholars, it plays an essential role in the trend towards KM behaviours and as well to provide support to a firm’s KM processes [36]. It has been suggested that a multiperspective view of intranet, which would help in the creation of an effective KM culture that can be segmented into different categories: information perspective, awareness perspective and communication perspective. Information analysis facilitates a speedy search of information, recovers information very quickly and enables communication among employees and hence allowing the creation and transferring of KM processes within the firm. Information plays an essential part as a mechanism for reflection; an information standpoint on the intranet is highly relevant and applicable for works that need intellect [36]. From the point of view of awareness, it was proposed that explicit information should be exploited to link firm’s employees with information and other individuals that might be otherwise missed. Another study carried out on the crucial success factors that involved the implementation of a knowledge management system (KMS) for the pharmaceutical sector in Taiwan [37]. The findings show the importance of an information system infrastructure in the adoption of a KMS. This implies that large organizations are more prone to notice that a system can be successful depends largely on the quality of information system structure and the capability of its maintenance personnel. From the point of view of communication, that the information analysis helps employees in a firm to collectively interpret the available information by lending support to the different forms of channels for negotiations and conversations, and hence converting such knowledge to benefit the organization as a whole [36]. Hence, the following proposition was made: **P5: Information and analysis is positively related to knowledge management behaviours (that is knowledge acquisition, knowledge dissemination and knowledge application).**

### **Propositions among KM behaviours:**

Research done on the associations among KM behaviours such as knowledge acquisition, knowledge application and knowledge dissemination has been few. As for knowledge application, it is well-known as the starting point of the KM process, which relates to the location, formation or the breakthrough of knowledge, which incorporates the tracking down and analyzing the available information and explicit knowledge [19]. Knowledge can be originated from a variety of different sources but associated with a variety of issues an organization is faced. For example, knowledge can be acquired from the employees of an organization and thus will reveal an individual’s

experiences and capabilities [19]. The distribution of knowledge within a firm has been the most discussed about issue in the literature of KM. With this knowledge creation spiral, a reasonably structured method was developed to disseminating knowledge [18]. Four forms of knowledge dissemination have been identified: socialization, externalization, combination and internalization [19]. The best practice to distribute knowledge is through systematic transfer, where an environment is created in which knowledge can be shared. As for knowledge application, it simply means the sharing of different types of knowledge in which a company has access to. For example, if the firm has acquired certain knowledge about a client, then it will apply the knowledge within itself. Associated strongly with knowledge application is the quality and timeliness of the firm's response, in which it is portrayed as a representation of organization's quickness and efficiency [19]. It was further posits that every element of KM behaviour is dependent upon other factors, whereby acquisition of knowledge will come first, followed by knowledge distribution and then response [19]. Based on the existing and previous literature, in which guidance is limited, a positive relationship has been proposed between the three knowledge management behaviours. In other words, an organization with a larger pool of knowledge will be better in its knowledge dissemination and knowledge application [19]. In the same manner, an organization that is well- developed in its knowledge dissemination will be better in its knowledge application [19].

### **Theoretical Implication:**

This study presents an up-to-date research in the area of TQM and has connotations on both theoretical and managerial perceptions. From the theoretical implications' perception, this is one of the few studies that intends to measure multidimensionality of QM elements and its association with knowledge management. Although many studies has been done on the topic of TQM, those studies rarely stressed on the impact of TQM on knowledge management. The theoretical model presented in this paper should be able to lay the conceptual base for the insight into the examination of the multidimensionality of knowledge management and TQM practices, which would then lead to more in-depth research in the area of TQM. This paper also aims to draw out further exploration by other fellow researchers into a more detailed research on the correlation matrix between TQM practices and knowledge management. Hence, this study further encourages more advanced research to be done on TQM and KM and to provide a clearer understanding of the link between TQM and KM behaviours to the quality management practitioners and academicians. To add on further, this study with its relatively new theoretical model, could also gather the attention of other researchers. Further research is anticipated to be carried out in different countries or in different industries using the conceptual model, to study the effects of TQM practices on KM behaviours and then to further explore into the measurement of the TQM change.

### **Managerial Implication:**

This research has shed some light into some practical implications for firms that plan to implement KM into their organizations, whereby the firms will be able to gauge the effects of TQM practices and the KM processes. Firstly, if top management has the intention to execute TQM practices, they can find some useful insights in this article. Second, the effects from any six constructs of the TQM model can cause different implications on the KM of employees at different levels of the organization. Third, this study has proven that when an activity or task is carried out to achieve a certain objective, this task or activity might transform into some other company's objectives. For the role as a predictive model, this study can also assists us by informing us of the shortcomings when a particular strategic TQM programme is implemented, which might have a negative effect on the results for KM. Hence, the different types of influences from TQM practices can be examined upon more easily by the management when they plan or carry out the organizational process. Therefore, it can be summarised that this conceptual model can provide a foundation for the practitioners to implement their TQM programmes more effectively and efficiently in their firm. Much have been proven that knowledge acquisition, knowledge dissemination and knowledge sharing are the main factors in knowledge functioning for any organization, hence, it is very important for the management to explore the effects of TQM implementation on KM programme. This proposed model is recommended to be useful in assisting senior managers of TQM companies who intend to

enhance their KM capabilities. With an improved comprehension on the relationship between TQM and KM, senior managers can better understand and identify the competitive KM capabilities.

### **Conclusion:**

Undeniably, TQM and KM contribute significantly to the improvisation of performance for any organization. The proposed model in this study seeks to close the gap in the literature for the assessment of the multidimensionality of TQM and its association with organizational KM. Furthermore, this model seeks to advance the literature regarding the relationship between TQM and KM research and at the same time, to provide a means for both the practitioners and the academicians to better comprehend the link between TQM practices and KM behaviours. Apart from that, this paper propose this model to be used for the implementation of TQM practices and also to measure the organizational processes such as the effectiveness of strategic planning, leadership, process management, customer service, human resource management and the employment of information analysis. The initial study on the model, which is to examine the link between TQM practices and the KM, has led to further studies on the six dimensions of TQM, which are known to be important attributes to the KM management. As for improvements, further surveys and research should be done using the multivariate analysis to test, validate and enhance the model. Currently, the questionnaire to collect data from manufacturing organizations in Malaysia is being designed, in order to confirm the proposed model and its propositions. The results obtained will be reported in a future article.

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