

# Integration of TQM practices and ERP to enhance innovation culture and innovative work behavior: A proposed framework

Abdulla Obaid Ahmad<sup>1</sup>, Soo-Fen Fam<sup>2</sup>, Zun Liang Chuan<sup>3</sup>, Sentot Imam Wahjono<sup>4</sup>,  
Najwa Mohd Nusa<sup>5</sup>, Saleh Ali Husseini<sup>6</sup>

<sup>1,2,6</sup> *Faculty of Technology Management and Technopreneurship, Universiti Teknikal Malaysia Melaka, Malaysia*

<sup>3</sup> *Faculty of Industrial Sciences and Technology, Universiti Malaysia Pahang, Malaysia*

<sup>4</sup> *Universitas Muhammadiyah, Surabaya, Indonesia*

<sup>5</sup> *Malaysia Institute of Transport, School of Civil Engineering, Univerisiti Teknologi MARA, Malaysia*  
E-mail: famsoofen@utem.edu.my

## Abstract

One of the most important technological innovations of the last decade has been the emergence of ERP solutions. But implementation of ERP is not just a technological challenge. It's a socio-technological endeavor, which mandates modifying existing applications and redesigning critical business processes to facilitate ERP implementation. Hence, there are organizational and cultural issues, which determine the success of ERP implementation. The main objective of implementing an ERP system is to integrate the organizations business processes and operations for improved business results. But not all organizations have been successful in the ERP implementation. The aim of this paper is an attempt to integrate the concept of TQM practices with ERP to enhance innovative work behavior as a part of corporate strategy in an organization. The results confirmed the positive and significant effects of TQM practices and ERP to enhance innovative work behavior. The mediation role of innovation culture between TQM practices and ERP and innovative work behavior also was confirmed. Throughout this study, further details and valuable implications have been discussed. Findings also help practitioners and managers make proper decisions when implementing TQM, ERP, and excellence practices in their organizations. With the joint effect of TQM practices, ERP and innovative work behavior, organizations can achieve maximum strong excellence and remain in a competitive market.

**Keywords:** TQM practices, ERP, Innovation culture, Innovative work behavior.

## 1. Introduction

In the last few years, the importance of quality has increased amongst organizations around the world to remain in a competitive environment. At present, quality, as a final goal, is not a choice but a mandatory strategy to satisfy customers and enhance organizational performance. Thus, organizations have begun searching for practices and strategies to achieve quality. Amongst these strategies and practices is total quality management (TQM) practices, which is considered by many researchers as a prerequisite philosophy to achieve the desired goals represented by enhancing the quality of products and services to satisfy customers (Al-Dhaafri and Alosani, 2021).

Many studies have focused on the important role of TQM practices in improving organizational performance (Abu Salim et al., 2019; Al-Dhaafri and Alosani, 2021). They have discussed the role of TQM practices and its dimensions, such as strategic planning, leadership, customer focus, human resource management, continuous improvement, information and analysis and benchmarking, on helping organizations achieve their objectives and enhance overall organizational performance. In addition, many arguments have focused on the relationship between TQM practices and innovation culture and how they can affect and complement each other to enhance innovative work behavior.

The resource-based view theory of the firm has been implemented in IT business to examine and develop theories about the effect of innovative IT potential on sustainable competitive advantages (Al-Dhaafri et al., 2016). In this regard, enterprise resource planning (ERP) system is considered as one of the leading IT systems. As innovative system, ERP is an innovation along with big organizations, and further extend to deal with other organizations, for instance, small and medium-sized organizations (SMEs) (Elsayed et al., 2021) and organizations that are running in the public sector (Sislian and Jaegler, 2020).

Innovation culture and innovative work behavior are the results that organizations fight to get, but which one is affecting the other, and which one is more importance to organizations. Most of researchers identified innovation culture as antecedent to innovative work behavior such as Al-Dhaafri et al. (2016); however, in other studies, innovation culture is considered as the ultimate goal for competitive advantage.

Owing to the importance of TQM practices, ERP and innovation culture for any organization, an empirical examination is conducted to show their joint effect on innovative work behavior.

## **2. Theoretical literature and hypothesis development**

### **2.1 innovative work behavior**

Innovative work behaviour an individual or personal attribute, innovative behaviour is defined as the behaviour that is likely to manifest itself in response to environments in which organizations practice innovation-oriented culture (Scott & Bruce, 1994). Innovative work behavior (IWB) is an important employee outcome that is related to the human dimension of organizational sustainability. Innovative work behavior (IWB) is an important factor that management scholars need to consider, significantly, in order to gain a competitive advantage and establish organizational sustainability (Abu Salim et al., 2019). Apart from research and development, the organizations operating in the highly competitive business environment also need innovative work behavior in other domains of businesses (Helmy, Adawiyah and Banani,

2019), in order to discover new ways of satisfying customer demands and retain their competitive position in the business world (Mohamad, Ramayah and Lo, 2020). Since the organizations rely on different actors to stimulate innovative work behavior (Waheed et al., 2019). In the context of this study, it is organization abilities and willingness to be innovative. An organization may have the capability to respond to change and new ideas; have tolerance for errors and different views; have freedom to experiment and take calculated risks; and be willing to adopt change and new ways of doing things.

### **2.2 innovation culture**

A culture of innovation is defined as a set of beliefs and concepts that motivate organisations to be creative. Additionally, it fosters an environment of inventiveness, open-ness to new ideas, and responsiveness in decision-making (Waheed et al., 2019). Innovation culture supports the creation of new ideas and their implementation. Values and beliefs are verbally and non-verbally communicated which shape the individual and organisational behaviours. As such, innovative culture is seen as a dominating metric that fosters the organization's desire for innovation. According to a re-cent research, innovative culture allow businesses to develop new goods, services, or processes (Helmy, Adawiyah and Banani, 2019).

### **2.3 Total quality management (TQM) practices**

TQM practices has been recognized for its potential to enhance competitive outcomes for organizations through continual improvement (Alofan et al., 2020). They argued that there is evidence in the literature that TQM practices differ significantly across organizations, with each organization having individual TQM profiles. Quality journey represents quality programs, which are implemented by organizations to improve and adapt in response to changing customer requirements (Ahmed and Idris., 2020). Therefore, successful quality management systems are not easily achieved due to the requirement from all parties to work towards one direction (Uluskan et al., 2018). TQM practices has been widely recognized as the management process that enables organizations in different sectors to address the rapid changes in business environment (Talib et

al., 2011). TQM practices is an important strategy that can help improve the quality of goods and services and customer satisfaction; TQM practices can also reduce waste, cost and time and increase productivity (Al-Dhaafri and Alosani, 2021; Uluskan et al., 2018; Alofan et al., 2020).

Al-Dhaafri and Alosani (2020) asked about the relationship between TQM practices and organizational excellence relationship, and how they can affect and complement each other to maximize efficiency and performance. They confirmed in their study in public sector a positive and significant impact of TQM practices on organizational excellence and organizational performance.

According to Kassem et al. (2018), excellent organizations achieve and maintain exceptional results that meet or go beyond the expectations of stakeholders within society. Organizational excellence has several main principles, such as emphasis on performance and customer satisfaction, leadership and specific priorities, process and fact management, employee growth and involvement, learning, innovation and creativity and social responsibility.

According to (Husseini, and Fam, 2019) examined the relationship between TQM practices, activities, and innovation in the context of Malaysian banks. The outcome of the Smart PLS statistical study demonstrated the positive impact of the implementation of the TQM practices method on innovation.

Innovative work behavior as the goal that organizations want to achieve. It has different meaning depending on the organization sector, industry and its purpose. In some cases, employees' satisfaction are of the desired outcome. In this regard, many studies found positive and significant impact of TQM practices on employees' satisfaction (Abu-Rumman et al., 2021; Ahmed and Idris, 2020). However, involves many authors who have confirmed the positive and significant findings achieved by implementing TQM practices. Other studies have reported insignificant or negative effects of TQM practices on innovation (Abu Salim et al., 2019). Due to these negative and insignificant results, certain researchers have suggested factors apart from TQM practices implementation to achieve improved results (Al-Dhaafri and Alosani,

2021; Abu Salim et al., 2019). Concerning the relationship between TQM practices, innovation culture, and IWB, (Shan et al., 2016) confirmed that TQM practices allow companies to build specific skills among workers to promote many facets of innovation and, as a result, establish and sustain competitive advantages. This theoretical discussion and debate, along with the current empirical proof, leads to the following hypothesis:

- H1. TQM practices has a positive and significant effect on innovative work behavior.
- H2. TQM practices has a positive and significant effect on innovation culture.

#### **2.4. Enterprise resource planning (ERP)**

For the last 20 years, enterprise resource planning (ERP) have been the cornerstone of centralized business process control in organizations (Kamdjou et al., 2019). While these programs have proved to be essential to business process productivity and, as a result, business growth, successful adoption of ERPs remains a major challenge for many modern companies (Alsharari, 2019).

ERP integrates both processes and functions of an organization creating a seamless, efficient and more transparent way of executing business operations (Gupta et al., 2018). An ERP system entails a change in the operational functioning of the organization. Hence, an

ERP system should be selected in accordance with the requirements of organization's processes (Al-Dhaafri and Alosani, 2021). There is a need to map the functionality of cloud ERP to the current business processes (Jede and Teuteberg, 2016). Any mismatch in the same may cause problems and delay in implementation. Integrating ERP into a service management department allows the organization to reduce its dependency on human effort and eliminates the need to maintain a number of scattered and distinct systems. The global success of ERP has captured the interest of business, information technology, and information systems researchers.

RBV helps to understand contextual implications on resources and capabilities that eventually impact the performance of an organization (Brandon-Jones et al., 2015). Utilizing a contingent resource-based perspective, we attempt in this study to

conceptualize the impact of ERP to innovation culture and innovative work behavior. The resource-based view (RBV) of firms is established by Barney (1991) to focus on the internal capabilities that can help organizations enhance performance and achieve competitive advantages over rivals. TQM practices and ERP are important internal factors for any organization as intangible resources that can differentiate them in the competitive market (Al-Dhaafri and Alosani, 2021). Therefore, the integration of strong variables, namely, TQM practices and ERP are capable to enhance innovative work behavior and attain competitive advantages which supposed by RBV theory.

Many previous studies found a strong effect of ERP on organizational performance (Elsayed et al., 2021; Al-Dhaafri and Alosani, 2021; Sislian and Jaegler, 2020); however, this conclusion still has many contradictions, which encourages us to examine this relationship based on the following hypotheses:

H3. ERP has a positive and significant effect on innovative work behavior.

H4. ERP has a positive and significant effect on innovation culture.

### 2.5. Mediating role of innovation culture

To maintain an innovative culture, organisations are urged to establish a foundation for innovation, which may involve modifications to the organization's operations in order to develop an appropriate culture and guide organisations through periodic periods of change. An innovative culture that fosters creativity may encourage workers to maintain a high quality of work, which in turn promotes the development of new goods and processes (Mohamad, Ramayah and Lo, 2020). Additionally, an innovative culture magnifies

the importance of empowering employees and encouraging them to be creative and develop skills that result in new goods and services.

According to (Shan et al., 2016; Iqbal, A., and Rehman, 2020), indicated an interaction between TQM practices and innovation which serve as intermediate variables. Thus, this study indicates that innovation aspects play a mediating function between TQM practices and IWB.

Therefore, Innovation pace will help a business boost its operating productivity and quality of service and launch new goods or services at a shorter time and at a cheaper cost than its rivals, resulting in improved IWB (Abu Salim et al., 2019).

Similarly, creativity efficiency can also contribute to improved success in innovations, research, and development practices by regulation. One of KBV's main recommendations, as Shujahat et al. (2018) emphasised, is that successful resource management improves creativity, which in turn enhances efficiency.

Finally, the findings of the Shan et al. (2016) indicated an interaction between TQM practices and creativity, which would in turn improve efficiency. This theoretical logic implies a mediating the relationship innovation position between the TQM practices and IWB, as suggested by previous empirical studies. Therefore, the following hypothesis is introduced.

H5. innovation culture has a positive and significant effect on innovative work behavior.

H6. innovation culture has a mediating role between TQM practices and innovative work behavior.

H7. innovation culture has a mediating role between ERP and innovative work behavior.

Table 1. Literature review summary

Construct	Author/Year	Journal	Index
TQM practices	Abu-Rumman et al. (2021)	Management Science Letters	Scopus
	Ahmed and Idris (2020)	The TQM Journal	Scopus
	Al-Dhaafri and Alosani, (2021)	World Journal of Entrepreneurship, Management and Sustainable Development	Emerald

<b>ERP</b>	Alsharari (2019)	International Journal of Disruptive Innovation in Government	Emerald
	Gupta et al. (2018)	International Journal of Logistics Management	Web of Science (ISI)/Scopus
	Sislian and Jaegler (2020)	Supply Chain Forum: An International Journal	Scopus
	Elsayed et al. (2021)	Enterprise Information Systems	Web of Science (ISI)/Scopus
<b>innovation culture</b>	Waheed et al., (2019)	Benchmarking: An International Journal	Web of Science
	Helmy, Adawiyah and Banani, 2019	Sustainability	(ISI)/Scopus
<b>IWB</b>	Abu Salim et al., (2019)	The Journal of Behavioral Science	(ISI)/Scopus
	Mohamad, Ramayah and Lo, (2020)	Benchmarking: An International Journal	Web of Science

Source(s): The study's authors

These results are in line with those of previous studies that report a positive and significant relationship amongst these variables (Al Dhaafri and Alosani, 2021). Similarly, ERP was found to have positive and significant effect on organizational excellence and performance which is consistent with finding of Al-Dhaafri et al. (2016). It was also found confirming the positive effect of innovation culture on organizational performance. This result is consistent with that of a previous study in the same line of research (Ahmad, 2019; Al-Dhaafri et al., 2016). The results also showed the importance of organizational performance as a mechanism on the relationships between TQM, ERP and organizational excellence which is in line with previous studies (Al-Dhaafri and Alosani, 2020). The role of organizational performance is not limited to be

the final goal as most of researches indicated, but as a practice and strategy to enhance the IWB.

### 3. The proposed framework for the research

The casual relationship between TQM practices and ERP integration toward the innovation culture and innovative work behaviour has been quite established in the literature, especially at an organizational level and less established at an individual level. Based on the discussion above, the integration of TQM practices and ERP provides expected long-term perspective of the work, which embarks innovative culture to the employees. Hence, it would lead to generate higher level of innovative work behavior.

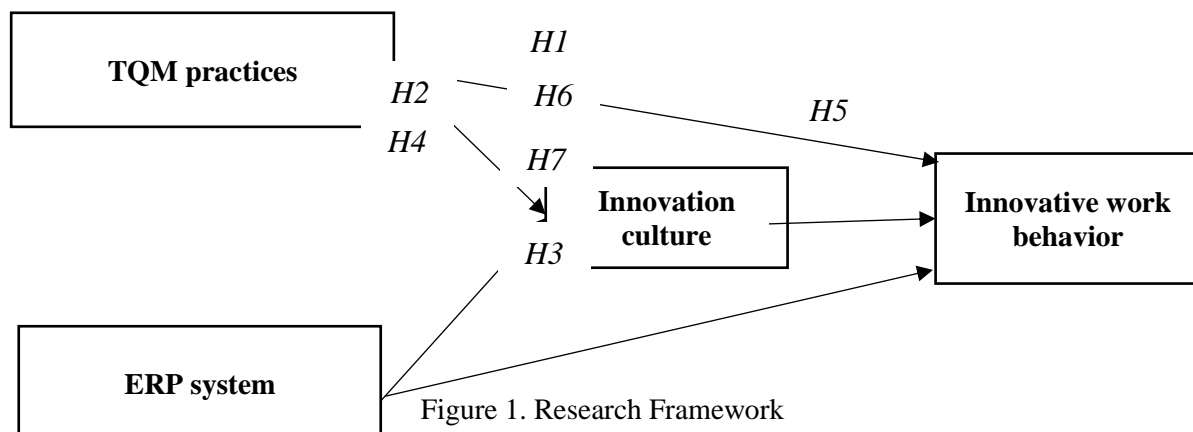


Figure 1. Research Framework

#### 4. Discussion

Based on previous results (Abu Salim, Sundarakani, & Lasrado, 2019; Albuhihi & Abdallah, 2018; Ernawati & Hamid, 2021), there are positive relationships between TQM practices and innovation. The relationships between both TQM practices and innovation had raised the interest among researchers in the management field. The variables were investigated by researchers between TQM practices and innovation which included innovation performance, product and process innovation, and process design and improvement (Abdi & Singh, 2021). Quality and innovation were generally two different disciplines, but both have similar importance towards business performance. Previously, innovation is mainly focused on technology, cost and quality control. Today, researchers are attempting to link with human resource skills. Due to TQM practices developed an advantageous environment to build better human resource skills in innovation (Ali AlShehail, Khan, & Ajmal, 2021). Organizations are needed to be prosperous in innovation in order to produce a standard quality of products. The relationship of both quality and innovation can be determined by business performance and development. Therefore, during the development and creation of new products or services, organizations are needed to base on the customers' requirement. Meanwhile, a new product launching it is needed to base on the market demand.

Innovative work behaviour (IWB) is referred to as an individual's intentional initiation of a new or useful idea in order to improve an existing product or process. It is a multi-stage and iterative process from idea generation to implementation (Basu & Bhola, 2021; Bouranta, 2021). Chen, Reyes, Dahlggaard, and Dahlggaard-Park (2021) highlighted four sequences of steps attributing to IWB such as problem recognition, idea generation, promotion and realization. These creative and implementation-oriented work behaviours, if promoted among the colleagues and realized by managers, would potentially improve the work role performance. Conti, Vesce, Crudele, and Pencarelli (2019) claim that human behaviour largely depends on the expected outcomes of behaviour and in a similar vein, IWB is also determined based on the performance of a desired outcome. Role theory states that

performance at work is based on social norms, internal and external expectations, which are related to social sanctions and rewards. In the absence of these social norms, an individual's self-efficacy and initiation make him proactive (Donate, Ruiz-Monterrubio, Sánchez de Pablo, & Peña, 2020).

Before embarking upon an ERP initiative, it is imperative that organizations develop a written business case (Aremu, Shahzad, & Hassan, 2019). Contained therein should be the expected benefits that will result from the project and steps for achieving these benefits (Syafiera, Lubis, Witjaksono, & Anggana, 2019). Management should also formally communicate the implementation objectives to employees and help everyone understand their contribution to the process as well as implications their decisions have on the value of the organization (Yang, Ishtiaq, & Anwar, 2018). Companies that embark upon an ERP project with clear and concise expectations of what the package will do for them will arguably realize greater organizational performance. Likewise, consensus among managers about the objectives of the ERP implementation, and how these objectives will be monitored and measured, will lead to higher user innovation culture level.

#### 5. Conclusion

In relation to innovative work behaviour, innovation culture is expected to have its results by providing excellent products and services. However, innovation culture can be also considered as a predictor due to its role in achieving excellence awards, which in this situation considered, as ultimate goal. Therefore, they used by many researchers in interchangeable situations. As a result, in this study innovation culture is put as a mechanism to explain the relationships between TQM practices, ERP and innovative work behavior. Innovation culture can therefore be the ultimate goal for attaining rewards and recognition and can be a method and technique for innovative work behavior (Mohamad, Ramayah and Lo, 2020).

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