

The Relationship between Enterprise Resource Planning, Total Quality Management, Organizational Excellence, and Organizational Performance-the Mediating Role of Total Quality Management and Organizational Excellence

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Abstract

Purpose: This study was set up to examine the mediating effect of TQM and organizational excellence between ERP and organizational performance.

Design/methodology/approach: To examine the model of the study, design of survey questionnaire was employed through data collected from Dubai Police Departments. Out of 565 questionnaires, 320 only usable returned. Partial Least Square (PLS) structural equation modelling was employed to analyze the data.

Findings: Based on statistical results, the effect of ERP on TQM, organizational excellence, and organizational performance were confirmed. In addition, the effect of TQM and organizational excellence on organizational performance was also confirmed. Moreover, TQM was found to partially mediate the effect of ERP on organizational performance, whereas organizational excellence was found to fully mediate the effect on the same relationship.

Practical implications: The results of this study have several practical implications. This study will help managers and decision makers to take the proper decision when implementing ERP system. Due to that, TQM and organizational excellence are the most important practices to ease the ERP implementation.

Originality/value: This study is considered as the only empirical study that examines the collective effect of ERP, TQM, and organizational excellence on organizational performance.

Keywords: enterprise resource planning (ERP), total quality management (TQM), organizational excellence (OE), organizational performance (OP), Dubai Police (DP)

1. Introduction

The current global competitive environment compels organizations around the world to enhance and increase their performance through implementing innovative strategies in order to sustain their business and remain competitive. To assist the process of development, organizations have to adopted different philosophies and approaches including Total Quality Management, business excellence (Oakland, 1999), and Enterprise Resource Planning (ERP) (Uwizeyemungu & Raymond, 2010).

The resource-based view theory (RBV) of the firm has been used in IT business research to investigate and theorize the effect of rare IT capabilities on sustainable competitive advantages (Masli, Richardson, Sanchez, & Smith, 2010). ERP effects on operations such as in supply chain based on RBV and contingency theories (Hwang & Min, 2013). Previous research has empirically reported a positive relationship between superior IT capabilities and organizational performance. One of those superior IT systems in the last few years is ERP system. The implementation of ERP as an innovative system with large business organizations, and later expanded to cover other organizations such as small and medium-sized organizations (SMEs) (Everdingen,

Hillegersberg, & Waarts, 2000) and organizations of public sector (Kumar, Maheshwari, & Kumar, 2002). While some organizations reported potential benefits from ERP implementation, others reported horror stories about ERP system (Barker & Frolick, 2003; Shang & Seddon, 2000). Therefore, the decision of using the most appropriate system is not an easy task. Organizations have to implement a system that can help them to achieve their goals with low risks. ERP as a complicated system can lead to achieve high performance and competitive advantages if supported by other factors inside and outside the organizations.

Total Quality Management (TQM) as a management philosophy can be one of those factors that can help ERP system to achieve the desired goals. It has been argued that TQM is a pre-requisite practice before implementing ERP system (Ghadilolaee, Aghajani, & Rahmati, 2010). Excellence as a desired outcome for any strategy and practice can be also considered as a practice that can help organizations to implement the proposed practice in excellent ways to achieve ultimately the best organizational performance. As a result, organizations that demonstrate IT excellence should generate the greatest values from spending in their IT strategy (Masli et al., 2010). In addition, while most of practices in TQM are moving in way, but there are still lacking of the significance of employee role in developing quality improvement for the sake of accomplishing business excellence (Rashid & Aslam, 2012).

This study examined the relationship between ERP and organizational performance. Due to the inconclusiveness findings in the previous literature of the relationship between ERP and organizational performance, this study is an attempt to investigate the mechanism of TQM and organizational excellence as mediator variables that can explain that relationship through implementing quantitative research based on questionnaire survey.

2. Related Literature and Research Hypotheses

The literature review is presented in seven sections. As a base for understanding the other following relationships, the first section presents the relationship between ERP and organizational performance. The other followed sections discussed the relationships between variables in the proposed framework. As a result of the thorough discussion of the previous studies in the literature, several hypotheses are proposed for these relationships to be tested in the following parts of this research.

2.1 ERP and Organizational Performance

In the literature there are many definitions for ERP system, however, there is no agreement among researchers on an agreed definition. One of the important definition in the previous literature was defined by Davenport (2002) "ERP as an advanced technological solution system that integrate critical information within organization such as supply chain, finance and accounting, human resource, and customer relationships". In addition, ERP is an information system that integrates the data of the organizations that are used in their operation (Pacheco-Comer & González-Castolo, 2012). There are many reasons and motivations behind implementation of ERP systems such as technical and business driven implementations (Botta-Genoulaz & Millet, 2006; Velcu, 2007).

The relationship between ERP system and organizational performance has been examined by many researchers. There are conflicting results in their relationship (Kang, Park, & Yang, 2008). Some of them reported a positive and significant relationship between ERP and organizational performance (Bendoly & Kaefer, 2004; da Silveira, Snider, & Balakrishnan, 2013; Fang & Lin, 2006; HassabElnaby, Hwang, & Vonderembse, 2012; Hayes et al., 2001; Hwang & Min, 2013; Peffer & Dos Santos, 1996; Velcu, 2007). However, on the other hand, there are some other researchers who reported adverse results (Hitt & Brynjolfsson, 1996; Weill, 1992; Wier, Hunton, & HassabElnaby, 2007).

The mixed results in the previous literature of the effect of ERP on organizational performance encourage us to do this study and examine that relationship with the existing of other variables that may help in increasing the positive and significant effect. But before investigating the mediating effect of TQM and organizational excellence, the direct effect of ERP on organizational performance can be examined to compare with other results. Therefore, the following hypothesis is proposed:

H₁: Enterprise Resource Planning has a positive and significant effect on the organizational performance.

2.2 ERP and TQM

Implementation of innovative initiatives such as ERP and TQM are considered the most important practices to enhance performance and gain competitive advantages (Abdinnour & Groen, 2009). There are few studies, such as Laframboise & Reyes (2005) that discuss the collective effective of both TQM and ERP (Abdinnour & Groen, 2009). Their study used a qualitative method through interviews in the aerospace industry. In addition, Ghadilolaee, Aghajani, and Rahmati (2010) argued in their study that implementation of ERP should be

preceded by implementation of TQM practice for the reason that TQM could bring continuous improvement and problem solving that enable organizations to implement ERP successfully.

Most of critical success factors of TQM and ERP are identical such as business process reengineering, culture, learning, training, top management support, open communication, etc. In their contribution to the same field, Jha and Joshi (2007) reported in their study that ERP and TQM practices are considered significant resources for any organization to gain competitive advantage. Additionally, Marc and Gyu (2003) argued that implementation of ERP not always success because of some critical success factors such as TQM, culture, and business process reengineering. From the above discussion, the following hypothesis is postulated:

H₂: Enterprise Resource Planning has a positive and significant effect on Total Quality Management

2.3 ERP and Organizational Excellence

The main purpose of implementing ERP in organizations is to achieve the maximum performance and gain competitive advantages over competitors. In order to achieve that, the ERP system should be implemented in excellent ways either through internal or external processes. Organizational excellence is the practice of making organizations better in excellence path and growth (Attafar, Forouzan, & Shojaei, 2012). According to Moghadami (2005), excellent organizations have different characteristics in terms of customer, employees, leadership, capital owner, learning, future generation, globalization, change or transformation, and suppliers. Each one of these characteristics plays an important role in achieving excellence that leads to achieve the desired performance. When implementing ERP as a technological system, implementers or business owners should focus on the previous characteristics to help ERP to achieve what is planned to be at the earlier stages. To discover the effect of ERP on organizational excellence, the following hypothesis is proposed to be examined:

H₃: Enterprise Resource Planning has a positive and significant effect on the organizational Excellence

2.4 TQM and Organizational Performance

Total Quality Management (TQM) is a management philosophy that has been obtained attention by many research (Ehigie & McAndrew, 2005), and confirms the role of internal and external suppliers, customer, and employees in pursuing continuous improvement (Kanji, 2002). There are a bulk in the literature that show the significance of TQM strategy in manufacturing organizations (Arawati, 2005; Sohal & Terziovski, 2000), service organizations (Yasin, Kunt, & Zimmerer, 2004), SMEs organizations (Sohail & Hoong, 2003), and public organizations (Nor Hazilah, 2004). However, there are plenty of studies on TQM practices, most of them in developed countries and only there are six studies out of 347 were conducted in the Middle East including Saudi Arabia, Qatar, and UAE (Sila & Ebrahimpour, 2002). Therefore, this study is an attempt to fill this gap in the literature.

The relationship between TQM and organizational performance has been examined by many researchers, however, some of them found that TQM can affect and enhance the performance positively and significantly (Abebe, 2014; Barh, Tee, & Rao, 2002; Dada & Watson, 2013; Demirbag et al., 2006; Feng, Prajogo, Tan, & Sohal, 2006; Fotopoulos & Psomas, 2010; Gadenne & Sharma, 2009; Hendricks & Singhal, 1997; Lee, 2004; Salaheldin, 2009; Tang & Tang, 2012; Wang & Yen, 2012; Zhang & Zhang, 2012). On the other hand, other researchers found that TQM has no effect on organizational performance and sometimes may affect the performance negatively (Dooyoung, Kalinowski, & El-Enein, 1998). The inconsistent findings in the previous literature urge for more researches to be conducted in this area. Therefore this study is a response to those calls from previous researchers to do more researches through including other variables. For this purpose, the following hypothesis is proposed to be tested:

H₄: Total Quality Management has a positive and significant effect on the organizational performance.

2.5 TQM and Organizational Excellence

As has been mentioned earlier, TQM is considered as one of the important strategic instrument that helps organizations to achieve optimal performance. In addition, TQM core essentials are to encourage business practice to increase customers' satisfaction, productivity, reduce cost, and enhance quality output. In other words, TQM is a strategy that helps organizations to enhance business excellence (Lee, 2002). According to Ionica and Baleanu (2010), the history of TQM from inspection to business excellence has gone through different stages such as quality control.

There are some studies that investigated the relationship between TQM and organizational excellence such as Sharma and Kodali (2008) who argued that TQM is considered as a fundamental standard to achieve excellence in manufacturing industry. In addition, Ioncia and Baleanu (2010) reported that the underlying principles of

EFQM Excellence Model are connected with basic TQM's principles. Moreover, Lyons, Acsente, and Waesberghe (2008) examined the relationship between TQM and knowledge management to integrate a sustainable excellence framework. Lee (2002) investigated how business excellence can be sustained through TQM. In conclusion, the area of how TQM can enhance organization performance through excellence is still rare in the literature; therefore this study tries to investigate more about this relationship. To achieve this purpose, the following hypothesis is proposed:

H₅: Total Quality Management has a positive and significant effect on the organizational Excellence.

2.6 Organizational Excellence and Organizational Performance

Antony and Bhattacharyya (2010) examined the relationship between organizational excellence and organizational performance where they found that organizational excellence could be figured base on relationship of performance indicators. They found also that organizational excellence enables managers to evaluate their organizations better than organizational performance method. In addition, Ooncharoen and Ussahawanitchakit (2008) in their study found that organizational excellence has a positive and significant effect on performance. Therefore the following hypothesis is postulated to be tested:

H₆: Organizational Excellence has a positive and significant effect on the organizational performance.

2.7 The Mediating Role of TQM and Organizational Excellence

As has been stated earlier, the direct effect of ERP on organizational performance has been studied by many researchers. However the abundant studies on this relationship, there are still inconclusiveness about the effect of ERP on organizational performance. Therefore, many researchers call for more researches in this area to be conducted by involving other variables that may affect the relationship positively and significantly. For this purpose, TQM and organizational excellence have been intervened in the relationship as mechanisms to explain in a better way the effect of ERP on organizational performance. Through implementing TQM practices and organizational excellence concepts, ERP may has the power to achieve the desired objectives and enhance performance. TQM and organizational excellence have many dimensions such as leadership, continuous improvement, innovation, customer focus, strategic planning, benchmarking, service design, etc. By practicing these strategies and practices inside the organization, ERP as a new system can benefit in all implementation stages to gain the proposed organizational performance. Logically, TQM and organizational excellence can bring the advantage to organizations because of their involving the elements of success. According to Mele and Colurcio (2006) organizational excellence when linked with TQM has different aspects such as development of partnership, public responsibility, coherence with objectives, leadership, continuous improvement, innovation, and learning. TQM and excellence can complement each other (Adebanjo, 2001), and therefore can bring a powerful management tools to facilitate the implementation of ERP system for the sake of achieving high organizational performance. In addition, the mediation of TQM as a strategic resource was examined by Prajogo and Sohal (2006) between differentiation strategy and performance where they found a partial mediation.

For this purpose, the following hypotheses are preposed to be examined in the next stage:

H₇: TQM mediate the relationship between ERP and Organizational Performance

H₈: Organizational Excellence mediate the relationship between ERP and Organizational Performance

3. Methodology

The main purpose of this study is to examine the effect of variables on each other's. To achieve that a quantitative methodology approach was employed. Questionnaire survey is considered as one of the important instruments to collect the primary data from respondents (Kerlinger & Lee, 2000). The data collected through cross-sectional research design which is suitable for this study to collect the data at the point of time. The survey questionnaires were distributed in January, 2014 and collected end of February, 2014 through hard copy and emails. The source of data was Dubai Police where the first author works. Because of the nature of this study's variables, sections of Dubai Police have been selected to fill the questionnaire through Head section officers. Head section officers are the middle managers as a link between managers and employees. They know better than other on how these practices and strategies are working. Five hundred forty five questionnaires have been distributed and three hundred and twenty were returned completely. Dimensions and measurements have been adopted and adapted from previous studies. ERP measurements have been adopted from Stratman and Roth (2002), whereas measurements of TQM from different sources: Brah, Wong, and Rao (2000), Anderson and Sohal (1999), Terziovski & Samson (1999), and Rao (2000). Measurements of organizational excellence have been adopted from Pinar and Girard (2000), and organizational performance from Kaplan and Norton (1992; 2000). Structural Equation Modeling (SEM) is the technique that used to analyze the data and test the proposed

hypothesis through Smart-PLS statistical software.

4. Statistical Analysis and Results

Partial Least Square (PLS) is used to confirm the reliability and validity of the outer. As confirmed by many researchers, reliability and validity are the initial tests before doing the hypotheses testing. The model of this study contains the variables: ERP, TQM, organizational excellence and organizational performance. In order to examine the relationships between these variables, this study follows the two-step approach suggested by Chin (1998).

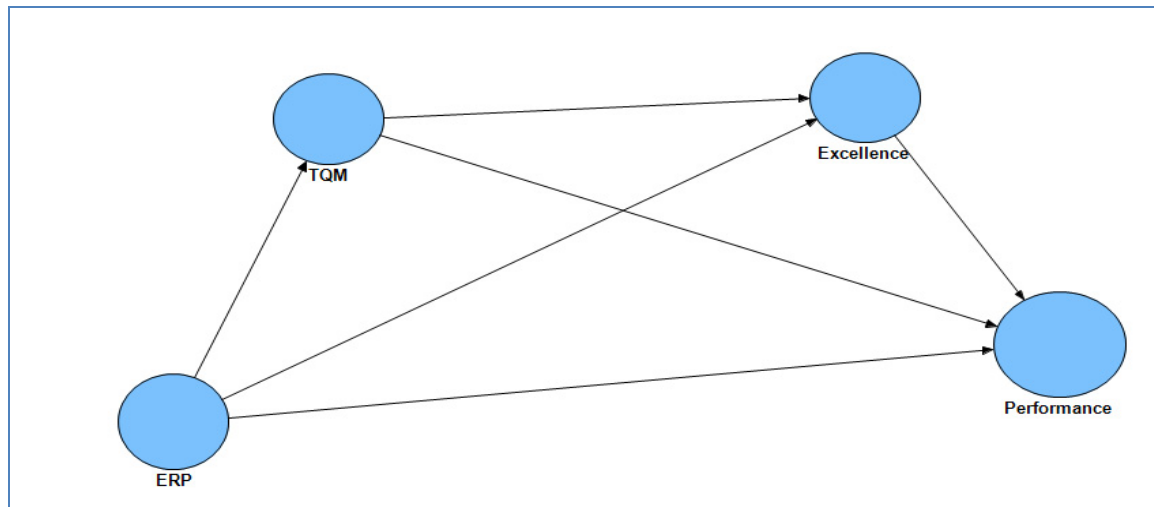


Figure 1. The research framework

In the literature of Structural Equation Modeling (SEM) the construct validity and reliability of the model should be approved before examining the hypothesized relationships.

4.1 The Outer Model (Measurement)

The following sections test the validity and reliability of the constructs before establishing the goodness of the measurement model. The construct validity and reliability was tested through the content validity, the discriminant validity, and the convergent validity as illustrated in the next sections.

4.1.1 The Content Validity

In multivariate analysis literature, the content validity of the construct compared with the other model's constructs. Therefore, Chin (1998) and Hair et al. (2010) suggested the using of factor loading to examine the content validity. To do that, the items will be deleted if are loaded high with other constructs than their respective ones. Table 1 and 2 showed that all the constructs are significantly loaded higher in their respective variables. Therefore, these results confirmed that the measurement model of this study has content validity.

Table 1. Factor loading significance

Construct	Items	Loadings	Standard Error	T Value	P Value
Benchmarking	B1	0.928	0.015	61.945	0.000
	B2	0.884	0.021	43.071	0.000
	B3	0.877	0.025	34.795	0.000
Continuous Improvement	CI1	0.902	0.012	76.117	0.000
	CI2	0.926	0.007	127.912	0.000
	CI3	0.867	0.020	43.058	0.000
	CI4	0.875	0.016	55.424	0.000
ERP-Business Process Skills	ERPB1	0.851	0.018	46.642	0.000
	ERPB2	0.876	0.012	71.143	0.000
	ERPB3	0.873	0.016	55.122	0.000

Construct	Items	Loadings	Standard Error	T Value	P Value
ERP-Change Readiness	ERPB4	0.919	0.011	84.528	0.000
	ERPB5	0.763	0.030	25.113	0.000
	ERPC1	0.861	0.018	46.858	0.000
	ERPC2	0.932	0.014	65.883	0.000
	ERPC3	0.880	0.012	72.873	0.000
	ERPC4	0.942	0.006	150.155	0.000
	ERPC5	0.888	0.013	70.955	0.000
ERP-Executive Commitment	ERPE1	0.861	0.023	37.969	0.000
	ERPE2	0.909	0.012	77.958	0.000
	ERPE3	0.925	0.009	99.169	0.000
	ERPE4	0.911	0.013	70.299	0.000
	ERPE5	0.714	0.033	21.507	0.000
ERP-IT Skills	ERPI1	0.840	0.023	35.784	0.000
	ERPI2	0.880	0.015	60.673	0.000
	ERPI3	0.891	0.015	59.710	0.000
	ERPI4	0.934	0.008	114.491	0.000
	ERPI5	0.817	0.031	26.168	0.000
ERP-Learning	ERPL1	0.778	0.024	31.882	0.000
	ERPL2	0.811	0.027	30.497	0.000
	ERPL3	0.851	0.015	57.700	0.000
	ERPL4	0.894	0.010	85.273	0.000
	ERPL5	0.842	0.022	38.850	0.000
ERP-Project Management	ERPP1	0.903	0.013	69.904	0.000
	ERPP2	0.905	0.012	76.008	0.000
	ERPP3	0.895	0.014	64.196	0.000
	ERPP4	0.895	0.013	67.671	0.000
	ERPP5	0.755	0.032	23.421	0.000
ERP-Strategic IT Planning	ERPS1	0.840	0.015	55.988	0.000
	ERPS2	0.887	0.012	77.035	0.000
	ERPS3	0.901	0.012	72.709	0.000
	ERPS4	0.904	0.013	69.108	0.000
	ERPS5	0.862	0.018	46.898	0.000
ERP-Training	ERPT1	0.825	0.020	41.460	0.000
	ERPT2	0.766	0.032	24.074	0.000
	ERPT3	0.850	0.016	54.514	0.000
	ERPT4	0.847	0.018	47.484	0.000
	ERPT5	0.805	0.021	37.848	0.000
Excellence-Customer Focus	EXC1	0.927	0.011	84.758	0.000
	EXC2	0.951	0.008	119.483	0.000
	EXC3	0.933	0.009	99.535	0.000
Excellence-Innovation	EXI1	0.884	0.014	61.997	0.000
	EXI2	0.908	0.015	62.436	0.000
	EXI3	0.910	0.013	68.133	0.000
Excellence-Personnel Commitment	EXP1	0.855	0.017	50.163	0.000
	EXP2	0.862	0.020	43.673	0.000
	EXP3	0.837	0.025	33.668	0.000
	EXP4	0.802	0.028	28.481	0.000
HRM	HRE1	0.862	0.015	57.933	0.000
	HRE2	0.785	0.020	38.587	0.000
	HRE3	0.785	0.020	39.039	0.000
	HRI1	0.793	0.028	28.688	0.000

Construct	Items	Loadings	Standard Error	T Value	P Value
Information and Analysis	HRI2	0.844	0.020	42.946	0.000
	HRI3	0.889	0.013	69.151	0.000
	HRT2	0.776	0.026	30.201	0.000
	HRT3	0.905	0.011	82.948	0.000
	HRTI	0.860	0.014	61.412	0.000
	IA1	0.801	0.024	32.802	0.000
	IA2	0.910	0.011	82.811	0.000
	IA3	0.848	0.022	38.033	0.000
	IA4	0.888	0.014	64.433	0.000
	IA5	0.902	0.010	86.148	0.000
Management Leadership	ML1	0.924	0.010	93.907	0.000
	ML2	0.892	0.017	51.406	0.000
	ML3	0.938	0.009	104.723	0.000
	ML4	0.920	0.012	78.487	0.000
Customer	OPC4	0.799	0.010	85.559	0.000
	OPC5	0.824	0.020	40.056	0.000
	OPC6	0.830	0.033	21.607	0.000
	OPC7	0.777	0.027	28.825	0.000
Financial	OPF1	0.866	0.020	40.355	0.000
	OPF2	0.740	0.027	28.253	0.000
	OPF3	0.762	0.013	64.619	0.000
Internal Process	OPI10	0.794	0.042	17.748	0.000
	OPI11	0.719	0.044	17.473	0.000
	OPI8	0.822	0.033	24.584	0.000
	OPI9	0.823	0.023	35.240	0.000
	OPL12	0.771	0.024	34.033	0.000
Learning and Growth	OPL13	0.803	0.022	35.931	0.000
	OPL14	0.754	0.019	44.190	0.000
	OPL15	0.869	0.020	41.264	0.000
Service Design	SD1	0.892	0.014	63.562	0.000
	SD2	0.943	0.007	140.834	0.000
	SD3	0.890	0.009	96.015	0.000
Strategic Planning	SP1	0.841	0.018	46.320	0.000
	SP2	0.884	0.014	63.567	0.000
	SP3	0.894	0.011	81.630	0.000
	SP4	0.846	0.015	56.679	0.000

Table 2. Factor analysis results

Construct	Items	B	CI	ERP	ERPC	ERPE	ERPI	ERPL	ERPP	ERPS	ERPT	Customer	Innovation	Commitment	HRI	IA	ML	OPC	OPF	OPI	OPL	SD	SP
Benchmarking	B1	0.9	0.8	0.55	0.37	0.72	0.53	0.5	0.45	0.73	0.5	0.45	0.49	0.28	0.75	0.71	0.47	0.35	0.16	0.32	0.35	0.72	0.61
	B2	0.9	0.74	0.56	0.36	0.57	0.56	0.45	0.42	0.7	0.47	0.32	0.47	0.3	0.76	0.73	0.46	0.26	0.17	0.29	0.35	0.71	#
	B3	0.9	0.73	0.52	0.27	0.59	0.52	0.4	0.4	0.71	0.41	0.36	0.51	0.36	0.67	0.71	0.52	0.25	0.16	0.3	0.38	0.68	0.58
Continuous Improvement	CI1	0.76	0.9	0.62	0.57	0.75	0.63	0.61	0.59	0.75	0.6	0.53	0.6	0.5	0.77	0.86	0.55	0.41	0.39	0.48	0.52	0.82	0.66
	CI2	0.77	0.9	0.61	0.47	0.74	0.58	0.52	0.61	0.78	0.49	0.41	0.61	0.49	0.78	0.81	0.67	0.33	0.37	0.45	0.49	0.8	0.69

Construct	Items	B	CI	ERPb	ERPC	ERPE	ERPI	ERPL	ERPP	ERPS	ERPT	Customer	Innovation	Commitment	HRI	IA	ML	OPC	OPF	OPI	OPL	SD	SP
ERPB	CI3	0.69	0.9	0.44	0.44	0.68	0.44	0.4	0.53	0.64	0.45	0.4	0.55	0.49	0.79	0.75	0.58	0.3	0.37	0.45	0.34	0.64	0.56
	CI4	0.81	0.9	0.56	0.37	0.71	0.56	0.47	0.37	0.7	0.47	0.3	0.48	0.3	0.76	0.73	0.52	0.22	0.2	0.38	0.36	0.71	0.59
	ERPB1	0.44	0.48	0.9	0.66	0.52	0.86	0.76	0.5	0.58	0.73	0.25	0.45	0.26	0.49	0.5	0.3	0.25	0.12	0.29	0.38	0.52	0.48
	ERPB2	0.6	0.57	0.9	0.6	0.64	0.84	0.74	0.53	0.64	0.68	0.42	0.49	0.25	0.55	0.5	0.3	0.39	0.14	0.31	0.43	0.57	0.54
	ERPB3	0.51	0.5	0.9	0.56	0.55	0.71	0.64	0.49	0.54	0.61	0.51	0.47	0.36	0.56	0.52	0.25	0.51	0.07	0.27	0.43	0.48	0.39
	ERPB4	0.52	0.58	0.9	0.64	0.57	0.76	0.71	0.58	0.65	0.68	0.41	0.52	0.34	0.63	0.59	0.31	0.38	0.2	0.34	0.42	0.59	0.44
	ERPB5	0.49	0.57	0.8	0.61	0.52	0.59	0.58	0.45	0.55	0.67	0.31	0.49	0.32	0.6	0.56	0.33	0.25	0.25	0.31	0.35	0.49	0.35
	ERPC1	0.41	0.52	0.68	0.9	0.54	0.73	0.79	0.67	0.43	0.67	0.39	0.43	0.48	0.43	0.55	0.5	0.47	0.4	0.24	0.46	0.5	0.56
	ERPC2	0.26	0.39	0.63	0.9	0.4	0.63	0.77	0.61	0.33	0.68	0.38	0.41	0.44	0.37	0.47	0.37	0.38	0.36	0.24	0.33	0.37	0.42
	ERPC3	0.34	0.45	0.57	0.9	0.47	0.61	0.75	0.58	0.39	0.68	0.34	0.39	0.4	0.4	0.47	0.4	0.24	0.36	0.21	0.25	0.4	0.43
ERPE	ERPC4	0.29	0.48	0.68	0.9	0.5	0.69	0.81	0.63	0.38	0.72	0.37	0.44	0.46	0.41	0.51	0.41	0.32	0.34	0.24	0.34	0.46	0.42
	ERPC5	0.4	0.49	0.65	0.9	0.57	0.64	0.8	0.61	0.46	0.72	0.33	0.41	0.38	0.44	0.53	0.5	0.32	0.37	0.21	0.36	0.51	0.5
	ERPE1	0.57	0.7	0.6	0.54	0.9	0.6	0.52	0.5	0.73	0.56	0.35	0.48	0.35	0.63	0.58	0.63	0.29	0.38	0.36	0.39	0.62	0.67
	ERPE2	0.66	0.77	0.63	0.48	0.9	0.59	0.55	0.48	0.78	0.6	0.41	0.45	0.31	0.7	0.65	0.59	0.37	0.26	0.37	0.44	0.68	0.65
	ERPE3	0.73	0.74	0.57	0.41	0.9	0.49	0.49	0.53	0.79	0.5	0.48	0.46	0.31	0.7	0.63	0.58	0.48	0.28	0.38	0.48	0.69	0.68
	ERPE4	0.69	0.67	0.5	0.39	0.9	0.45	0.41	0.48	0.73	0.49	0.44	0.5	0.35	0.62	0.57	0.6	0.42	0.34	0.37	0.48	0.65	0.67
	ERPE5	0.46	0.61	0.52	0.56	0.7	0.51	0.55	0.79	0.61	0.42	0.53	0.47	0.5	0.49	0.58	0.55	0.43	0.46	0.3	0.47	0.68	0.57
	ERPI1	0.53	0.62	0.72	0.77	0.61	0.8	0.74	0.68	0.6	0.61	0.4	0.48	0.45	0.5	0.63	0.53	0.37	0.38	0.24	0.49	0.65	0.59
	ERPI2	0.49	0.46	0.71	0.57	0.42	0.9	0.68	0.45	0.56	0.64	0.21	0.45	0.24	0.48	0.51	0.3	0.23	0.15	0.33	0.41	0.49	0.48
	ERPI3	0.58	0.59	0.75	0.59	0.54	0.9	0.67	0.48	0.56	0.7	0.34	0.41	0.28	0.58	0.59	0.31	0.34	0.15	0.35	0.44	0.57	0.53
ERPL	ERPI4	0.57	0.59	0.87	0.71	0.62	0.9	0.8	0.53	0.61	0.8	0.43	0.49	0.29	0.58	0.6	0.31	0.4	0.16	0.35	0.5	0.6	0.54
	ERPI5	0.39	0.43	0.79	0.57	0.46	0.8	0.7	0.49	0.56	0.68	0.29	0.52	0.3	0.44	0.44	0.25	0.25	0.16	0.34	0.39	0.47	0.42
	ERPL1	0.45	0.43	0.69	0.6	0.48	0.73	0.8	0.47	0.54	0.74	0.3	0.37	0.23	0.47	0.51	0.27	0.29	0.14	0.24	0.37	0.5	0.49
	ERPL2	0.5	0.54	0.77	0.6	0.57	0.76	0.8	0.44	0.57	0.68	0.23	0.38	0.23	0.58	0.57	0.31	0.31	0.13	0.29	0.44	0.59	0.45
	ERPL3	0.35	0.48	0.66	0.86	0.49	0.64	0.9	0.57	0.44	0.68	0.31	0.35	0.32	0.41	0.46	0.41	0.29	0.41	0.16	0.32	0.41	0.4

Construct	Items	B	CI	ERPB	ERPC	ERPE	ERPI	ERPL	ERPP	ERPS	ERPT	Customer Innovation Commitment	HRI	IA	ML	OPC	OPF	OPI	OPL	SD	SP			
ERPP	ER PL4	0. 39	0. 44	0. 62	0. 8	0. 44	0. 67	0. 9	0. 59	0. 4	0. 64	0. 28	0. 3	0. 26	0. 39	0. 46	0. 32	0. 26	0. 24	0. 09	0. 28	0. 45	0. 42	
	ER PL5	0. 43	0. 47	0. 6	0. 78	0. 45	0. 65	0. 8	0. 53	0. 39	0. 6	0. 28	0. 29	0. 3	0. 38	0. 53	0. 35	0. 25	0. 2	0. 05	0. 26	0. 49	0. 41	
	ER PP1	0. 36	0. 48	0. 55	0. 59	0. 52	0. 59	0. 55	0. 9	0. 43	0. 37	0. 4	0. 6	0. 65	0. 47	0. 54	0. 59	0. 44	0. 46	0. 43	0. 54	0. 59	0. 59	0. 56
	ER PP2	0. 45	0. 55	0. 49	0. 62	0. 56	0. 55	0. 56	0. 9	0. 45	0. 41	0. 39	0. 55	0. 57	0. 51	0. 58	0. 6	0. 41	0. 49	0. 42	0. 54	0. 63	0. 61	0. 61
	ER PP3	0. 45	0. 51	0. 56	0. 66	0. 64	0. 56	0. 64	0. 9	0. 52	0. 43	0. 51	0. 48	0. 49	0. 42	0. 5	0. 54	0. 5	0. 48	0. 33	0. 53	0. 6	0. 58	0. 58
	ER PP4	0. 46	0. 54	0. 55	0. 61	0. 59	0. 54	0. 54	0. 9	0. 49	0. 41	0. 49	0. 52	0. 55	0. 55	0. 59	0. 55	0. 53	0. 51	0. 36	0. 52	0. 59	0. 54	0. 54
	ER PP5	0. 35	0. 51	0. 44	0. 53	0. 47	0. 4	0. 41	0. 8	0. 43	0. 42	0. 45	0. 58	0. 64	0. 49	0. 56	0. 5	0. 4	0. 56	0. 35	0. 45	0. 48	0. 37	0. 37
	ER PS1	0. 71	0. 67	0. 63	0. 44	0. 73	0. 58	0. 52	0. 49	0. 8	0. 53	0. 39	0. 38	0. 19	0. 63	0. 57	0. 44	0. 35	0. 18	0. 28	0. 39	0. 62	0. 58	0. 58
	ER PS2	0. 7	0. 71	0. 65	0. 37	0. 76	0. 63	0. 51	0. 52	0. 9	0. 52	0. 45	0. 52	0. 34	0. 7	0. 66	0. 48	0. 38	0. 19	0. 34	0. 46	0. 72	0. 59	0. 59
	ERPS	ER PS3	0. 67	0. 69	0. 56	0. 3	0. 69	0. 54	0. 44	0. 41	0. 9	0. 42	0. 28	0. 45	0. 27	0. 67	0. 63	0. 54	0. 14	0. 24	0. 29	0. 34	0. 67	0. 6
	ER PS4	0. 71	0. 72	0. 65	0. 43	0. 76	0. 6	0. 52	0. 5	0. 9	0. 54	0. 36	0. 5	0. 34	0. 74	0. 73	0. 52	0. 22	0. 25	0. 31	0. 37	0. 72	0. 63	
	ER PS5	0. 68	0. 74	0. 54	0. 39	0. 76	0. 56	0. 48	0. 42	0. 9	0. 57	0. 25	0. 5	0. 3	0. 66	0. 64	0. 55	0. 11	0. 25	0. 3	0. 35	0. 65	0. 6	
ERPT	ER PT1	0. 38	0. 47	0. 67	0. 69	0. 48	0. 71	0. 67	0. 38	0. 46	0. 8	0. 28	0. 39	0. 28	0. 42	0. 51	0. 3	0. 2	0. 17	0. 28	0. 38	0. 48	0. 48	
	ER PT2	0. 37	0. 43	0. 59	0. 59	0. 47	0. 53	0. 58	0. 36	0. 41	0. 8	0. 41	0. 47	0. 33	0. 45	0. 4	0. 21	0. 3	0. 15	0. 31	0. 3	0. 34	0. 27	
	ER PT3	0. 43	0. 46	0. 59	0. 62	0. 5	0. 57	0. 61	0. 36	0. 49	0. 8	0. 38	0. 41	0. 3	0. 46	0. 47	0. 22	0. 26	0. 12	0. 29	0. 33	0. 41	0. 32	
	ER PT4	0. 41	0. 41	0. 68	0. 68	0. 44	0. 68	0. 72	0. 38	0. 48	0. 8	0. 24	0. 31	0. 16	0. 43	0. 49	0. 23	0. 22	0. 16	0. 19	0. 34	0. 46	0. 38	
	ER PT5	0. 55	0. 54	0. 68	0. 57	0. 55	0. 72	0. 69	0. 44	0. 55	0. 8	0. 29	0. 42	0. 24	0. 54	0. 57	0. 27	0. 22	0. 1	0. 26	0. 4	0. 55	0. 42	
EXC	EX C1	0. 39	0. 42	0. 36	0. 33	0. 51	0. 33	0. 29	0. 48	0. 38	0. 33	0. 9	0. 58	0. 61	0. 39	0. 44	0. 37	0. 68	0. 41	0. 45	0. 55	0. 41	0. 54	
	EX C2	0. 42	0. 47	0. 42	0. 41	0. 51	0. 39	0. 36	0. 48	0. 37	0. 38	0. 1	0. 66	0. 67	0. 39	0. 49	0. 39	0. 72	0. 49	0. 48	0. 62	0. 42	0. 5	
	EX C3	0. 41	0. 4	0. 46	0. 38	0. 41	0. 36	0. 3	0. 49	0. 37	0. 38	0. 9	0. 71	0. 73	0. 4	0. 46	0. 38	0. 62	0. 4	0. 48	0. 55	0. 36	0. 44	
EXI	EXI 1	0. 46	0. 54	0. 52	0. 44	0. 49	0. 52	0. 37	0. 61	0. 47	0. 46	0. 58	0. 9	0. 71	0. 59	0. 53	0. 49	0. 57	0. 5	0. 71	0. 62	0. 49	0. 51	
	EXI 2	0. 48	0. 54	0. 48	0. 36	0. 48	0. 44	0. 32	0. 53	0. 5	0. 39	0. 65	0. 9	0. 73	0. 54	0. 56	0. 48	0. 47	0. 5	0. 59	0. 6	0. 5	0. 47	
	EXI 3	0. 51	0. 62	0. 53	0. 46	0. 49	0. 49	0. 41	0. 55	0. 48	0. 47	0. 65	0. 9	0. 71	0. 57	0. 58	0. 46	0. 46	0. 44	0. 56	0. 57	0. 48	0. 49	
EXP	EX P1	0. 32	0. 49	0. 34	0. 44	0. 32	0. 37	0. 3	0. 57	0. 27	0. 28	0. 53	0. 78	0. 9	0. 45	0. 52	0. 53	0. 42	0. 58	0. 65	0. 55	0. 46	0. 46	
	EX P2	0. 34	0. 48	0. 31	0. 41	0. 39	0. 34	0. 34	0. 56	0. 28	0. 29	0. 68	0. 73	0. 9	0. 42	0. 51	0. 52	0. 54	0. 59	0. 6	0. 54	0. 44	0. 5	
	EX P3	0. 21	0. 32	0. 2	0. 33	0. 36	0. 2	0. 16	0. 53	0. 27	0. 21	0. 67	0. 6	0. 8	0. 23	0. 4	0. 54	0. 57	0. 58	0. 38	0. 54	0. 32	0. 44	
	EX P4	0. 26	0. 38	0. 34	0. 43	0. 36	0. 31	0. 28	0. 56	0. 27	0. 28	0. 51	0. 53	0. 8	0. 37	0. 44	0. 63	0. 52	0. 32	0. 33	0. 44	0. 37	0. 53	

Construct	Items	B	CI	ERP	ERPC	ERPE	ERPI	ERPL	ERPP	ERPS	ERPT	Customer	Innovation	Commitment	HRI	IA	ML	OPC	OPF	OPI	OPL	SD	SP	
HRM	HR	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
	E1	66	71	52	24	58	48	34	4	66	45	28	48	28	9	71	31	15	13	43	27	66	38	
	HR	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	E2	68	78	64	54	67	6	55	52	74	51	46	58	46	8	72	57	34	29	35	34	65	56	
	HR	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	E3	6	74	5	43	58	54	47	56	63	45	29	44	43	8	81	46	28	34	43	4	74	52	
	HR	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	I1	68	67	48	34	63	37	36	58	65	37	41	61	42	8	61	52	34	25	55	36	61	58	
	HR	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	I2	72	73	53	35	65	45	44	51	64	43	31	56	35	8	68	45	29	23	48	34	69	51	
	HR	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
I3	78	76	62	43	61	61	55	49	68	52	36	57	4	9	75	48	35	21	5	37	7	55		
HR	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
T2	56	64	42	28	58	37	28	35	54	45	3	44	27	8	66	28	25	26	5	32	63	41		
HR	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
T3	67	71	63	38	62	49	49	41	63	5	36	52	32	9	69	37	32	2	47	32	65	42		
HR	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
TI	71	74	58	4	54	52	52	33	62	53	36	49	31	9	7	34	24	15	44	23	64	46		
Information and Analysis	IA1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
	IA2	56	68	51	49	54	54	4	55	56	56	52	58	57	67	8	46	39	35	56	53	67	54	
	IA3	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	IA4	74	75	46	36	55	45	49	54	64	35	36	48	44	73	8	49	31	27	35	36	78	55	
	IA5	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Management Leadership	ML	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
	ML1	53	68	36	46	67	41	39	59	6	33	34	54	6	53	59	9	34	47	36	48	62	73	
	ML2	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
	ML3	48	53	21	32	54	27	26	52	47	14	29	43	53	41	46	9	3	53	32	41	49	72	
Customer	ML	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
	ML4	48	58	36	51	66	38	41	62	53	34	44	5	65	45	51	9	46	47	27	44	51	75	
	ML	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
	ML4	46	6	35	5	63	37	4	6	5	29	4	47	62	48	53	9	44	49	24	39	49	72	
Financial	OP	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
	OPC4	19	25	33	43	37	27	33	47	16	19	61	44	59	18	28	43	8	41	23	46	21	41	
	OP	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
Internal Process	OPC5	11	14	3	29	22	25	22	45	06	11	48	4	51	18	17	33	8	31	39	53	17	37	
	OP	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
	OPC6	39	33	37	21	44	32	29	31	28	3	62	49	42	29	3	26	8	34	44	62	33	41	
Internal Process	OP	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
	OPC7	35	4	35	33	43	33	26	48	36	32	61	45	46	43	42	35	8	51	49	63	37	4	
	OP	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
Internal Process	F1	13	34	15	33	32	19	18	46	18	12	49	48	63	23	36	52	57	9	53	57	32	45	
	OP	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
	OPF2	06	22	16	29	29	19	23	44	2	15	24	37	37	18	23	3	2	7	28	24	23	23	
Internal Process	OP	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
	OPF3	24	31	12	35	34	18	26	47	24	16	3	39	41	25	33	39	29	8	27	35	29	32	
	OPI	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
Internal Process	I10	25	34	17	11	34	19	05	34	21	26	47	5	48	4	36	21	35	39	8	48	35	4	
	OPI	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
Internal Process	I11	26	44	37	3	42	36	27	4	34	36	37	61	43	45	36	29	33	48	7	55	35	32	

Construct	Items	B	CI	ERP	ERPC	ERPE	ERPI	ERPL	ERPP	ERPS	ERPT	Customer	Innovation	Commitment	HRI	IA	ML	OPC	OPF	OPI	OPL	SD	SP
Learning and Growth	OPI8	0.22	0.35	0.27	0.17	0.26	0.29	0.14	0.3	0.22	0.19	0.29	0.48	0.38	0.41	0.38	0.17	0.44	0.37	0.8	0.56	0.4	0.29
	OPI9	0.34	0.46	0.31	0.22	0.29	0.31	0.17	0.33	0.32	0.22	0.45	0.6	0.59	0.5	0.43	0.36	0.43	0.3	0.8	0.47	0.41	0.5
	OP L12	0.31	0.42	0.51	0.46	0.48	0.47	0.43	0.55	0.43	0.48	0.57	0.54	0.48	0.31	0.4	0.38	0.59	0.48	0.52	0.8	0.43	0.44
	OP L13	0.18	0.27	0.26	0.28	0.3	0.29	0.21	0.49	0.2	0.26	0.43	0.49	0.51	0.27	0.33	0.34	0.59	0.49	0.54	0.8	0.36	0.32
	OP L14	0.51	0.47	0.48	0.31	0.47	0.57	0.44	0.4	0.44	0.44	0.42	0.51	0.37	0.42	0.46	0.33	0.46	0.17	0.45	0.8	0.48	0.44
	OP L15	0.31	0.41	0.29	0.21	0.44	0.35	0.24	0.45	0.35	0.23	0.53	0.57	0.59	0.29	0.4	0.45	0.59	0.5	0.58	0.9	0.44	0.45
	SD1	0.72	0.73	0.55	0.42	0.62	0.59	0.52	0.61	0.69	0.48	0.39	0.51	0.47	0.7	0.82	0.51	0.27	0.28	0.39	0.43	0.9	0.63
	SD2	0.69	0.77	0.59	0.47	0.73	0.6	0.58	0.62	0.69	0.5	0.4	0.49	0.41	0.71	0.79	0.49	0.36	0.32	0.42	0.52	0.9	0.6
Service Design	SD3	0.72	0.78	0.55	0.47	0.74	0.56	0.5	0.58	0.71	0.52	0.37	0.49	0.42	0.77	0.78	0.57	0.3	0.38	0.49	0.49	0.9	0.61
	SP1	0.48	0.52	0.3	0.33	0.52	0.39	0.36	0.46	0.48	0.27	0.34	0.36	0.49	0.43	0.5	0.66	0.36	0.35	0.35	0.38	0.53	0.8
	SP2	0.52	0.62	0.48	0.54	0.69	0.52	0.53	0.49	0.57	0.47	0.39	0.48	0.5	0.49	0.57	0.75	0.41	0.43	0.41	0.45	0.59	0.9
	SP3	0.61	0.65	0.56	0.46	0.74	0.6	0.48	0.57	0.69	0.43	0.56	0.57	0.52	0.56	0.58	0.7	0.55	0.32	0.45	0.52	0.62	0.9
Strategic Planning	SP4	0.61	0.63	0.42	0.46	0.64	0.51	0.43	0.6	0.61	0.42	0.51	0.47	0.48	0.55	0.63	0.64	0.39	0.44	0.42	0.41	0.59	0.8

4.1.2 The Convergent Validity

The convergent validity is the degree of a group of items converges to measure a specific variable (Hair et al., 2010). In SEM literature, it can be confirmed by testing the composite reliability, the loading, and the average variance extracted (AVE). To consider the items are highly loaded and statistically significant, factor loading should at least 0.7, AVE is at least 0.5, and the composite reliability is at least 0.7. Table 3 shows that all these criteria have been achieved and confirmed. Therefore, the results of the outer model (measurement model) have suitable convergent validity (Bagozzi & Yi, 1988).

Table 3. The convergent validity analysis

Construct	Items	Loadings	Cronbach's Alpha	CR ^a	AVE ^b
Benchmarking	B1	0.928	0.852	0.917	0.724
	B2	0.884			
	B3	0.877			
Continuous Improvement	CI1	0.902	0.915	0.940	0.797
	CI2	0.926			
	CI3	0.867			
	CI4	0.875			
ERP-Business Process Skills	ERP B1	0.851	0.909	0.933	0.736
	ERP B2	0.876			
	ERP B3	0.873			
	ERP B4	0.919			
	ERP B5	0.763			
ERP-Change Readiness	ERPC1	0.861	0.942	0.956	0.812

Construct	Items	Loadings	Cronbach's Alpha	CR ^a	AVE ^b
ERP-Executive Commitment	ERPC2	0.932	0.915	0.938	0.752
	ERPC3	0.880			
	ERPC4	0.942			
	ERPC5	0.888			
	ERPE1	0.861			
	ERPE2	0.909			
	ERPE3	0.925			
	ERPE4	0.911			
ERP-IT Skills	ERPE5	0.714	0.922	0.941	0.763
	ERPI1	0.840			
	ERPI2	0.880			
	ERPI3	0.891			
	ERPI4	0.934			
ERP-Learning	ERPI5	0.817	0.892	0.921	0.699
	ERPL1	0.778			
	ERPL2	0.811			
	ERPL3	0.851			
	ERPL4	0.894			
ERP-Project Management	ERPL5	0.842	0.920	0.941	0.761
	ERPP1	0.903			
	ERPP2	0.905			
	ERPP3	0.895			
	ERPP4	0.895			
ERP-Strategic IT Planning	ERPP5	0.755	0.926	0.944	0.773
	ERPS1	0.840			
	ERPS2	0.887			
	ERPS3	0.901			
	ERPS4	0.904			
ERP-Training	ERPS5	0.862	0.877	0.911	0.671
	ERPT1	0.825			
	ERPT2	0.766			
	ERPT3	0.850			
	ERPT4	0.847			
Excellence-Customer Focus	ERPT5	0.805	0.930	0.956	0.878
	EXC1	0.927			
	EXC2	0.951			
Excellence-Innovation	EXC3	0.933	0.883	0.928	0.811
	EXI1	0.884			
	EXI2	0.908			
Excellence-Personnel Commitment	EXI3	0.910	0.860	0.905	0.704
	EXP1	0.855			
	EXP2	0.862			
	EXP3	0.837			
HRM	EXP4	0.802	0.945	0.954	0.696
	HRE1	0.862			
	HRE2	0.785			
	HRE3	0.785			
	HRI1	0.793			
	HRI2	0.844			
	HRI3	0.889			
	HRT2	0.776			

Construct	Items	Loadings	Cronbach's Alpha	CR ^a	AVE ^b
Information and Analysis	HRT3	0.905	0.920	0.940	0.758
	HRTI	0.860			
	IA1	0.801			
	IA2	0.910			
	IA3	0.848			
	IA4	0.888			
Management Leadership	IA5	0.902	0.938	0.956	0.844
	ML1	0.924			
	ML2	0.892			
	ML3	0.938			
Customer	ML4	0.920	0.823	0.882	0.653
	OPC4	0.799			
	OPC5	0.824			
	OPC6	0.830			
Financial	OPC7	0.777	0.715	0.833	0.625
	OPF1	0.866			
	OPF2	0.740			
Internal Process	OPF3	0.762	0.799	0.869	0.625
	OPI10	0.794			
	OPI11	0.719			
	OPI8	0.822			
Learning and Growth	OPI9	0.823	0.813	0.877	0.641
	OPL12	0.771			
	OPL13	0.803			
	OPL14	0.754			
Service Design	OPL15	0.869	0.894	0.934	0.826
	SD1	0.892			
	SD2	0.943			
Strategic Planning	SD3	0.890	0.889	0.923	0.751
	SP1	0.841			
	SP2	0.884			
	SP3	0.894			
	SP4	0.846			

a: $CR = (\sum \text{factor loading})^2 / \{(\sum \text{factor loading})^2 + \sum (\text{variance of error})\}$

b: $AVE = \sum (\text{factor loading})^2 / (\sum (\text{factor loading})^2 + \sum (\text{variance of error}))$

4.1.3 The Discriminant Validity

The literature of SEM defined the discriminant validity as the degree of items can distinguish a construct from other model's constructs. According to Compeau et al. (1999), items of each construct should have variances among them more than with other constructs in the model. Table 4 shows that the diagonal line of values that contain the square root of AVE and below it there are the correlations of the constructs. To examine the discriminant validity, the values of the diagonal line should be compared with other off diagonal ones. As we can see in the table, the values of the diagonal line are higher than others in their respective columns and rows and therefore confirmed the discriminant validity of the model based on Fornell and Larcker's (1981) criterion.

Table 4. Correlation and discriminant validity

Construct	B	CI	Commitment	Customer	ERPB	ERPC	ERPE	ERPI	ERPL	ERPP	ERPS	ERPT	HRI	IA	Innovation	ML	OPC	OPF	OPI	OPL	SD	SP	
B	0.85																						
CI	0.84	0.89																					
Commitment	0.34	0.50	0.84																				
Customer	0.43	0.46	0.72	0.94																			
ERPB	0.60	0.63	0.36	0.44	0.86																		
ERPC	0.38	0.52	0.48	0.40	0.71	0.90																	
ERPE	0.72	0.81	0.42	0.51	0.65	0.55	0.87																
ERPI	0.59	0.62	0.36	0.39	0.86	0.74	0.61	0.87															
ERPL	0.51	0.57	0.32	0.34	0.80	0.87	0.59	0.83	0.84														
ERPP	0.47	0.59	0.66	0.51	0.60	0.69	0.64	0.61	0.62	0.87													
ERPS	0.79	0.81	0.33	0.40	0.69	0.44	0.84	0.66	0.56	0.53	0.88												
ERPT	0.52	0.57	0.32	0.39	0.78	0.77	0.60	0.79	0.80	0.47	0.59	0.82											
HRI	0.81	0.81	0.44	0.42	0.66	0.46	0.73	0.60	0.54	0.56	0.77	0.56	0.83										
IA	0.79	0.71	0.56	0.49	0.62	0.56	0.70	0.64	0.61	0.64	0.74	0.60	0.85	0.87									
Innovation	0.54	0.63	0.79	0.70	0.57	0.47	0.54	0.54	0.41	0.62	0.54	0.49	0.63	0.62	0.90								
ML	0.53	0.65	0.65	0.40	0.35	0.49	0.68	0.39	0.40	0.64	0.58	0.30	0.51	0.57	0.53	0.92							
OPC	0.33	0.36	0.61	0.72	0.42	0.39	0.46	0.37	0.34	0.53	0.28	0.29	0.34	0.37	0.55	0.42	0.81						
OPF	0.18	0.38	0.62	0.46	0.18	0.41	0.40	0.23	0.27	0.57	0.25	0.17	0.28	0.39	0.53	0.53	0.49	0.79					
OPI	0.34	0.50	0.59	0.50	0.36	0.25	0.41	0.37	0.20	0.43	0.35	0.32	0.55	0.48	0.69	0.33	0.49	0.49	0.79				
OPL	0.40	0.48	0.62	0.61	0.47	0.39	0.52	0.51	0.40	0.59	0.43	0.43	0.39	0.49	0.66	0.47	0.70	0.53	0.65	0.80			
SD	0.78	0.84	0.48	0.43	0.62	0.50	0.77	0.64	0.59	0.66	0.77	0.55	0.80	0.88	0.55	0.58	0.34	0.36	0.48	0.53	0.91		
SP	0.64	0.70	0.57	0.52	0.52	0.52	0.75	0.59	0.52	0.62	0.68	0.46	0.59	0.66	0.55	0.79	0.50	0.44	0.48	0.51	0.68	0.87	

4.2 The Inner Model (Structural Model), and Hypotheses Testing

4.2.1 Testing the Direct Hypotheses

After testing the validity and reliability of the construct, the next step is to examine in the inner model through hypotheses testing by running Algorithm and Bootstrapping in PLS. Figure 2 and Table 5 illustrated the results.

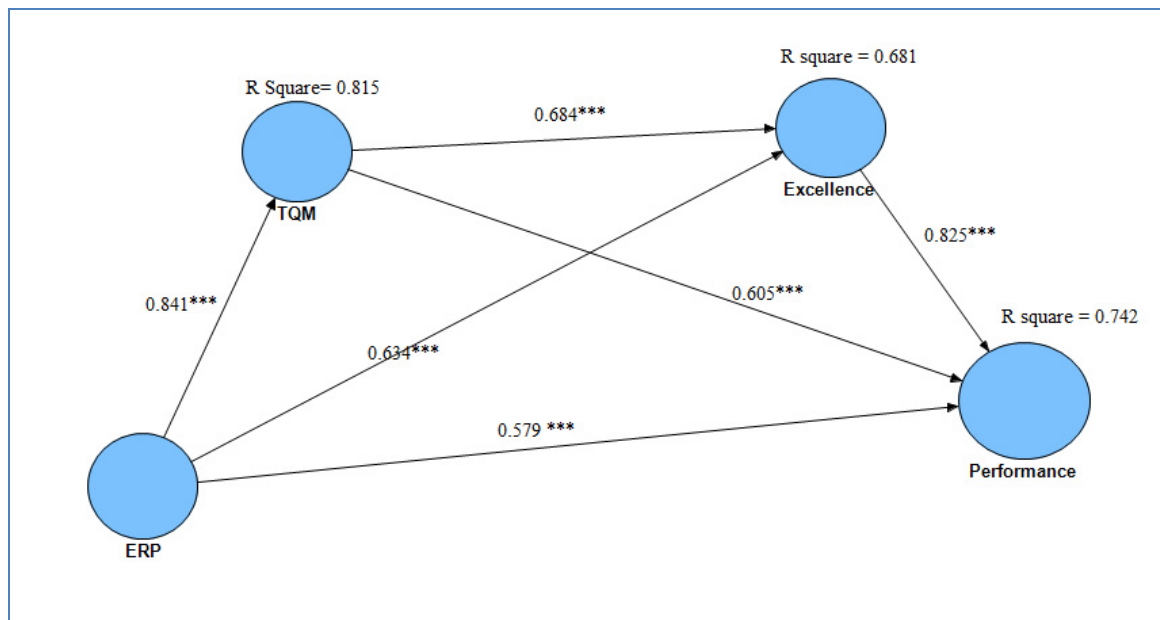


Figure 2. Hypotheses testing results

Table 5. Hypotheses testing results

No	Hypothesis	Path Coefficient	Standard Error	T Value	P Value	Decision
H1	ERP-> Performance	0.579***	0.038	15.293	0.000	Supported
H2	ERP-> TQM	0.841***	0.019	44.301	0.000	Supported
H3	ERP-> Excellence	0.634***	0.041	15.337	0.000	Supported
H4	TQM-> Performance	0.605***	0.047	12.973	0.000	Supported
H5	TQM-> Excellence	0.684***	0.047	14.422	0.000	Supported
H6	Excellence-> Performance	0.825***	0.024	34.747	0.000	Supported

***:p<0.001; **:p<0.01; *:P<0.05

Figure 2 and Table 5 show that all the six hypotheses have positive and significant results at the 0.001 level of significance ($\beta=0.579$, $t= 15.293$, $p<0.001$), ($\beta=0.841$, $t= 44.301$, $p<0.001$), ($\beta=0.634$, $t= 15.337$, $p<0.001$), ($\beta=0.605$, $t= 12.973$, $p<0.001$), ($\beta=0.684$, $t= 14.422$, $p<0.001$), and ($\beta=0.825$, $t= 34.747$, $p<0.001$) respectively. Therefore, these results supported the hypotheses of the study H1, H2, H3, H4, H5, and H6.

4.2.2 Testing the Mediation Role of TQM and Organizational Excellence

In order to examine the mediation effect of TQM and organizational excellence, SmartPLS was used to estimate the indirect impact between variables. Table 6 shows that TQM has a mediation effect on the relationship between ERP and organizational performance at the 0.001 level of significance ($\beta = 0.199$, $t = 2.695$, $p < 0.001$) and therefore confirm H7. The other hypothesis (H8) also confirmed where organizational excellence was found to have a mediation effect on the relationship between ERP and organizational performance at the 0.001 level of significance ($\beta = 0.491$, $t = 12.332$, $p < 0.001$). To decide whether these medications are full or partial, Variance Accounted For (VAF) has been employed. According to VAF (58%), TQM was found to have a partial mediation whereas organizational excellence has full mediation (81%) (Hair et al., 2014).

Table 6. Mediation analysis results

Hypothesis No	Hypothesis	a		b		a*b		C		C'		Variance Accounted For	Decision
		Path Coefficient	T-Value	Path Coefficient	T-Value	Path Coefficient	T-Value	Path Coefficient	T-Value	Path Coefficient	T-Value		
H7	TQM mediate the relationship between ERP and Organizational Performance	0.849**	48.330	0.399**	4.676	0.199**	2.695	0.58**	15.960	0.249**	3.864	0.576	Partial Mediation
H8	Organizational Excellence mediate the relationship between ERP and Organizational Performance	0.655**	16.842	0.75**	16.947	0.491**	12.332	0.58**	15.960	0.113**	2.642	0.813	Full Mediation

4.3 Predictive Relevance of the Model

R-square, cross-validated redundancy and cross-validated communality were employed to test the predictive power of the model. According to Cohen (1988), values of R-square are substantial with 0.26, moderate with 0.13, and weak with 0.02. All values in the table of R-square are considered substantial. Cross-validated redundancy and cross-validated communality are the medium to assess the model's quality. To extract them, blindfolding procedure in PLS was employed. Their values should be more than zero to say that the model has predictive quality (Fornell & Cha, 1994). Table 7 shows values more than zero and therefore confirmed that the model has prediction quality.

Table 7. Prediction relevance of the model

Construct	R Square	Cross-validity Redundancy	Cross-validity Communality
Total Quality Management	0.735	0.407	0.582
Organizational Excellence	0.505	0.309	0.642
Organizational performance	0.687	0.292	0.430

4.4 Goodness of Fit (GoF) of the Model

According to Wetzels et al. (2009), GoF can be confirmed based on the criteria: (small =0.1, medium =0.25, large =0.36). Table 8 below shows that the GoF value was 0.743 which considered large value.

Table 8.

Construct	R Square	Average Variance Extracted	Goodness of Fit
Benchmarking	0.731	0.724	
Continuous Improvement	0.877	0.797	
ERP		0.736	
ERPC		0.812	
ERPE		0.752	

Construct	R Square	Average Variance Extracted	Goodness of Fit
ERPI		0.763	
ERPL		0.699	
ERPP		0.761	
ERPS		0.773	
ERPT		0.671	
EXC	0.758	0.878	
EXI	0.860	0.811	
EXP	0.832	0.704	
HRM	0.774	0.696	
Information and Analysis	0.848	0.758	
Management Leadership	0.572	0.844	
Customer	0.703	0.653	
Financial	0.508	0.625	
Internal Process	0.655	0.625	
Learning and Growth	0.814	0.641	
Service Design	0.811	0.826	
Strategic Planning	0.700	0.751	
Average	0.746	0.741	0.743

5. Discussion and Conclusion

The main purpose of this study is to examine the direct and indirect effect of ERP on organizational performance. Due to the inconsistency in the literature of the effect of ERP on organizational performance, two mediators' variables have been proposed as mechanisms to explain this relationship in different context. These two variables are TQM and organizational excellence. As expected from the nature and the integration between variables, all hypotheses have been confirmed. In addition, in consistent with other previous studies, ERP has been found to have a positive and significant effect on organizational performance ($\beta=0.579$, $t= 15.293$, $p<0.001$) (Poston & Grabski, 2001; Park, Suh, & Yang, 2007). However, the effect of ERP on TQM and ERP on organizational excellence have not been linked before in the literature, it was found that they have positive and significant effect ($\beta=0.841$, $t= 44.301$, $p<0.001$) and ($\beta=0.634$, $t= 15.337$, $p<0.001$) respectively. In line with other previous studies, TQM was found to have a positive and significant effect at 0.001 level of significance ($\beta=0.605$, $t= 12.973$, $p<0.001$) (Chong & Rundun, 2004; Hassan & Kerr, 2003). Moreover, TQM was found to have positive and significant effect on organizational excellence ($\beta=0.684$, $t= 14.422$, $p<0.001$), and organizational excellence has positive and significant effect on organizational performance ($\beta=0.825$, $t= 34.747$, $p<0.001$).

The mediation role of TQM and organizational excellence also were examined. TQM was found to have a partial mediation effect with 58% influence of ERP on organizational performance at the 0.001 level of significance ($\beta=0.199$, $t= 2.695$, $p<0.001$). Similarly, organizational excellence with 81% influence of ERP on organizational performance, was found to have full mediation at the 0.001 level of significant ($\beta=0.491$, $t= 12.332$, $p<0.001$).

This study has many theoretical contributions. Besides examining the direct effect among variables due to the inconclusiveness finding in the previous literature, this study involves and examines new relationships between variables i.e. ERP-TQM and ERP-organizational excellence. In addition, this study fills the gap in the literature by examining the mediating effect of TQM and organizational excellence on the relationship between ERP and organizational performance. The results of this study will urge other researchers to investigate and examine other factors that may play some roles in these relationships. The framework of this study is a unique framework which suggested new relationships which never studied before.

In practice, the findings of this study have different practical implications. This study clears the way to managers and decision makers to involve TQM and excellence in their organizations while implementing ERP system. Due to the complexity of implementing ERP system, managers should think to have preliminary practice such as TQM to ease the ERP pre-implementation and post-implementation stages. Moreover, organizations face difficulties when implementing ERP system, therefore, other instruments needed to facilitate and pave the roads for successful implementation. Based on the conclusion of this study, managers should have some management practices in their organization such as TQM and excellence before thinking to implement ant ERP system. The reason behind that is to avoid the failure that may affect the entire organizations and may lead for collapsing.

There are some limitations of this study. Similar to other previous research surveys, the data collected through self-reported which considered one of common method bias (Thornton, 2006). Cross-sectional as the research design of this study was used which considered another limitation. The biasness may also generate from the self-reported answers where the respondents translate their perceptions through the questionnaire. Therefore, future researches should include the mixed method design. In addition, longitudinal researches should be considered to test the effects of TQM, Excellence, and ERP on organizational performance in different point of times.

References

- Abdinnour, S., & Groen, E. (2009). Quality, ERP, and Performance at Hawker Beechcraft. *Production and Inventory Management Journal*, 45(1), 21-30.
- Abebe, M. (2014). Electronic commerce adoption, entrepreneurial orientation and small-and medium-sized enterprise (SME) performance. *Journal of Small Business and Enterprise Development*, 21(1), 100-116. <http://dx.doi.org/10.1108/JSBED-10-2013-0145>
- Adebanjo, D. (2001). TQM and business excellence: Is there really a conflict? *Measuring Business Excellence*, 5(3), 37-40. <http://dx.doi.org/10.1108/13683040110403961>
- Anderson, M., & Sohal, A. S. (1999). A study of the relationship between quality management practices and performance in small businesses. *International Journal of Quality & Reliability Management*, 16(9), 859-877. <http://dx.doi.org/10.1108/02656719910289168>
- Antony, J. P., & Bhattacharyya, S. (2010). Measuring organizational performance and organizational excellence of SMEs-Part 2: An empirical study on SMEs in India. *Measuring Business Excellence*, 14(3), 42-52. <http://dx.doi.org/10.1108/13683041011074209>
- Antony, J. P., & Bhattacharyya, S. (2010). Measuring organizational performance and organizational excellence of SMEs-Part 1: A conceptual framework. *Measuring Business Excellence*, 14(2), 3-11. <http://dx.doi.org/10.1108/13683041011047812>
- Arawati, A. (2005). The structural linkages between TQM, product quality performance, and business performance: Preliminary empirical study in electronics companies. *Singapore Management Review*, 27(1), 87-105.
- Attafar, A., Forouzan, B., & Shojaei, M. (2012). Evaluation of Organizational Excellence Based on Peters and Waterman's Model in Tuka Steel Investment Holding. *American Journal of Scientific Research*, (50), 119-137.
- Barker, T., & Frolick, M. N. (2003). ERP implementation failure: A case study. *Information Systems Management*, 20(4), 43-49. <http://dx.doi.org/10.1201/1078/43647.20.4.20030901/77292.7>
- Bendoly, E., & Kaefer, F. (2004). Business Technology Complementarities: Impacts of the Presence and Strategic Timing of ERP on B2B E-commerce Technology Efficiencies. *Omega*, 32(5), 395-406. <http://dx.doi.org/10.1016/j.omega.2004.02.004>
- Bhatt, G. D. (2000). An empirical examination of the effects of information systems integration on business process improvement. *International Journal of Operations & Production Management*, 20(11), 1331-1359. <http://dx.doi.org/10.1108/01443570010348280>
- Botta-Genoulaz, V., & Millet, P. A. (2006). An investigation into the use of the ERP systems in the service sector. *International Journal of Production Economics*, 99, 202-221. <http://dx.doi.org/10.1016/j.ijpe.2004.12.015>
- Brah, S. A., Tee, S. S. L., & Rao, B. M. (2002). Relationship between TQM and performance of Singapore companies. *International Journal of Quality & Reliability Management*, 19(4), 356-379. <http://dx.doi.org/10.1108/02656710210421553>
- Brah, S. A., Wong, J. L., & Rao, B. M. (2000). TQM and business performance in the service sector: A Singapore study. *International Journal of Operations & Production Management*, 20(11), 1293-1312. <http://dx.doi.org/10.1108/01443570010348262>
- da Silveira, G. J., Snider, B., & Balakrishnan, J. (2013). Compensation-based incentives, ERP and delivery performance Analysis from production and improvement perspectives. *International Journal of Operation & Production Management*, 33(4), 415-441. <http://dx.doi.org/10.1108/01443571311307307>
- Davenport, H. T. (2002). Putting the Enterprise into the Enterprise System. *Harvard Business Review*, 9(3), 14.
- Demirbag, M., Koh, S. C. L., Tatoglu, E., & Zaim, S. (2006). TQM and market orientation's impact on SMEs'

- performance. *Industrial Management & Data System*, 106(8), 1206-1228. <http://dx.doi.org/10.1108/02635570610710836>
- Dooyoung, S., Kalinowski, J. G., & El-Enein, G. (1998). Critical implementation issues in total quality management. *SAM Advanced Management Journal*, 63(1), 10-14.
- Ehigie, B. O., & McAndrew, E. B. (2005). Innovation, diffusion, and adoption of total quality management (TQM). *Management Decision*, 43(6), 925-940. <http://dx.doi.org/10.1108/00251740510603646>
- Everdingen, Y. V., Hillegersberg, J. V., & Waarts, E. (2000). ERP Adoption by European midsize companies. *Communication of the ACM*, 43(3), 27-31. <http://dx.doi.org/10.1145/332051.332064>
- Fang, M., & Lin, F. (2006). Measuring the Performance of ERP System-from the Balanced Scorecard Perspectives. *Journal of American Academy of Business*, 10(1), 256-263.
- Feng, J., Prajogo, D. I., Tan, K. C., & Sohal, A. S. (2006). The impact of TQM practices on performance: A comparative study between Australian and Singaporean organizations. *European Journal of Innovation Management*, 9(3), 269-278. <http://dx.doi.org/10.1108/14601060610678149>
- Fotopoulos, C. V., & Psomas, E. L. (2010). The structural relationships between TQM factors and organizational performance. *The TQM Journal*, 22(5), 539-552. <http://dx.doi.org/10.1108/17542731011072874>
- Gadenne, D., & Sharma, B. (2009). An investigation of the hard and soft quality management factors of Australian SMEs and their association with firm performance. *International Journal of Quality & Reliability Management*, 26(9), 865-880. <http://dx.doi.org/10.1108/02656710910995064>
- Hackman, J., & Wageman, R. (1995). Total Quality Management: Empirical, conceptual, and practical issues. *Administrative Science Quarterly*, 40, 309-342. <http://dx.doi.org/10.2307/2393640>
- Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (2010). *Multivariate Data*.
- Hair, J. F., Hult, G. T., Ringle, C. M., & Sarstedt, M. (2014). *A primer on partial least squares structural equation modeling (PLS-SEM)*. Sage.
- Hasan, M., & Kerr, R. M. (2003). The relationship between total quality management practices and organizational performance in service organizations. *The TQM Magazine*, 15(4), 286-291. <http://dx.doi.org/10.1108/09544780310486191>
- HassabElnaby, H. R., Hwang, W., & Vonderembse, M. A. (2012). The impact of ERP implementation on organizational capabilities and firm performance. *Benchmarking*, 19(4/5), 618-633. <http://dx.doi.org/10.1108/14635771211258043>
- Hayes, D. C., Hunton, J. E., & Reck, J. L. (2001). Market reaction to ERP implementation announcements. *Journal of Information System*, 15(1), 3-18. <http://dx.doi.org/10.2308/jis.2001.15.1.3>
- Hendricks, K. B., & Singhal, V. R. (1997). Does implementing an effective TQM program actually improve operating performance empirical evidence from firms that have Won Quality Awards? *Management Science*, 43(9), 1258-1274. <http://dx.doi.org/10.1287/mnsc.43.9.1258>
- Hitt, L. M., & Brynjolfsson, E. (1996). Productivity, business profitability, and consumer surplus: Three different measures of information technology value. *MIS Q*, 20(2), 121-142. <http://dx.doi.org/10.2307/249475>
- Hwang, W., & Min, H. (2013). Assessing the impact of ERP on supplier performance. *Industrial Management & Data Systems*, 113(7), 1025-1047. <http://dx.doi.org/10.1108/IMDS-01-2013-0035>
- Ionica, A., & Baleanu, V. (2010). TQM and business excellence. *Annals of the University of Petroșani, Economics*, 10(4), 125-134.
- Jha, V. S., & Joshi, H. (2007). *Relevance of Total Quality Management (TQM) or business Excellence Strategy Implementation for Enterprise Resource Planning (ERP)-A Conceptual Study*.
- Kang, S., Park, J. H., & Yang, H. D. (2008). ERP alignment for positive business performance : Evidence from Korea's ERP market. *Journal of Computer Information Systems*, 25-38.
- Kanji, G. (2002). *Measuring Business Excellence*. London: Routledge.
- Kaplan, R. S., & Norton, D. P. (1992). The balanced scorecard ± measures that drive Performance. *Harvard Business Review*, 70-79.
- Kaplan, R. S., & Norton, D. P. (2000). Having trouble with your strategy? Then map it. *Harvard Business Review*, 78(5), 167-176.

- Kerlinger, F. N., & Lee, H. B. (2000). *Foundations of behavioral research* (4th ed.). Harcourt College Publishers: Orlando, US.
- Kumar, V., Maheshwari, B., & Kumar, U. (2002). Enterprise Resource Planning Systems Adoption Process: A Survey of Canadian Organizations. *International Journal of Production Research*, 40, 509-523. <http://dx.doi.org/10.1080/00207540110092414>
- Laframboise, K. (2002). *Business Performance and Enterprise Resource Planning*. Proceedings of ECIS 2002 Conference, Gdansk, Poland.
- Laframboise, K., & Reyes, F. (2005). Gaining competitive advantage from integrating enterprise resource planning and total quality management. *Journal of Supply Chain Management*, 41(3), 49-64. <http://dx.doi.org/10.1111/j.1055-6001.2005.04103005.x>
- Lee, C. Y. (2004). TQM in small manufacturers: An exploratory study in China. *International Journal of Quality & Reliability Management*, 21(2), 175-197. <http://dx.doi.org/10.1108/02656710410516970>
- Lee, P. M. (2002). Sustaining business excellence through a framework of best practices in TQM. *The TQM Magazine*, 14(3), 142-149. <http://dx.doi.org/10.1108/09544780210425883>
- Lyons, K., Acsente, D., & Waesberghe, M. V. (2008). Integrating knowledge management and quality management to sustain knowledge enabled excellence in performance. *The journal of information and knowledge management systems*, 38(2), 241-253.
- Manetti, J. (2001). How Technology Is Transforming Manufacturing. *Production and Inventory Management Journal*, 42(1), 54-64.
- Marc, S. J., & Gyu, K. C. (2003). Implementing Enterprise Resource Planning systems with Total Quality Control and Business Process Reengineering. *International Journal of Operations & Production Management*, 23(4), 418-429. <http://dx.doi.org/10.1108/01443570310467339>
- Markus, M. L., Axline, S., Petrie, D., & Tanis, C. (2000). Learning from adopters' experiences with ERP: Problems encountered and success achieved. *Journal of Information Technology*, 15(4), 245-266. <http://dx.doi.org/10.1080/02683960010008944>
- Masli, A., Richardson, V. J., Sanchez, J. M., & Smith, R. E. (2010). Return to IT excellence: Evidence from financial performance around information technology excellence awards. *International Journal of Accounting Information System*, 12, 189-205. <http://dx.doi.org/10.1016/j.accinf.2010.10.001>
- Mele, C., & Colurcio, M. (2006). The evolving path of TQM: Towards business excellence and stakeholder value. *International Journal of Quality & Reliability Management*, 23(5), 464-489. <http://dx.doi.org/10.1108/02656710610664569>
- Moghadami, S. (2005). Mysteries of organizational excellence. *Tadbir Monthly Magazine*, 144.
- Nor Hazilah, A. M. (2004). *Quality management in the public sector: An empirical survey of the Ministry of Health Hospitals in Peninsular Malaysia*. Unpublished PhD dissertation: Universiti Malay.
- Oakland, J. S. (1995). *Total Quality Management* (Oxford: Butterworth-Heinemann).
- Pacheco-Comer, A. A., & González-Castolo, J. C. (2012). An empirical study in selecting Enterprise Resource Planning Systems: The relation between some of the variables involve on it. *Size and Investment, Procedia Technology*, 3, 292-303. <http://dx.doi.org/10.1016/j.protcy.2012.03.032>
- Park, J. H., Suh, H. J., & Yang, H. D. (2007). Perceived absorptive capacity of individual users in performance of Enterprise Resource Planning (ERP) usage: The case for Korean firms. *Information & Management*, 44(1), 300-312. <http://dx.doi.org/10.1016/j.im.2007.02.001>
- Peffer, K., & Dos Santos, B. L. (1996). Performance effects of innovative IT applications over time. *IEEE Trans Eng Manage*, 43(4), 381-392. <http://dx.doi.org/10.1109/17.543980>
- Pinar, M., & Girard, T. (2008). Investigating the Impact of Organizational Excellence and Leadership on Business Performance: An Exploratory Study of Turkish Firms. *SAM Advanced Management Journal*, 73(1), 29-45.
- Poston, R., & Grabski, S. (2001). Financial impacts of enterprise resource planning implementations. *International Journal of Accounting Systems*, 2(4), 271-294. [http://dx.doi.org/10.1016/S1467-0895\(01\)00024-0](http://dx.doi.org/10.1016/S1467-0895(01)00024-0)
- Prajogo, D. I., & Sohal, A. S. (2004). The multidimensionality of TQM practices in determining quality and innovation performance-an empirical examination. *Technovation*, 24(6), 443-453. <http://dx.doi.org/10.1016/>

S0166-4972(02)00122-0

- Rao, S. S. (2000). Enterprise resource planning: Business needs and technologies. *Industrial Management & Data Systems*, 100(2), 81-86. <http://dx.doi.org/10.1108/02635570010286078>
- Rashid, K., & Aslam, H. (2012). Business excellence through total supply chain quality management. *Asian Journal on Quality*, 13(3), 309-324. <http://dx.doi.org/10.1108/15982681211287829>
- Salaheldin, S. I. (2009). Critical success factors for TQM implementation and their impact on performance of SMEs. *International Journal of Productivity and Performance Management*, 58(3), 215-237. <http://dx.doi.org/10.1108/17410400910938832>
- Shang, S., & Seddon, P. B. (2000). *A Comprehensive framework for classifying the benefits of ERP systems*. Proceedings of the Sixth Americas Conference on Information Systems, Long Beach, Ca, August 10-13.
- Sharma, M., & Kodali, R. (2008). TQM implementation elements for manufacturing excellence. *The TQM Magazine*, 20(6), 599-621. <http://dx.doi.org/10.1108/17542730810909365>
- Sila, I., & Ebrahimpour, M. (2002). An investigation of the total quality management survey based research published between 1989 and 2000: A literature review. *International journal of Quality and Reliability Management*, 19(7), 902-970.
- Sohail, M. S., & Hoong, T. B. (2003). TQM practices and organizational performances of SMEs in Malaysia: Some empirical observations. *Benchmarking*, 10(1), 37-53. <http://dx.doi.org/10.1108/14635770310457539>
- Sohal, A. S., & Terziovski, M. (2000). TQM in Australian manufacturing: Factors critical to success. *International Journal of Quality & Reliability Management*, 17(2), 158-167. <http://dx.doi.org/10.1108/02656710010304564>
- Stratman, J. K., & Roth, A. V. (2002). Enterprise resource planning (ERP) competence constructs: Two-stage multi-item scale development and validation. *Decision Sciences*, 33(4), 601-628. <http://dx.doi.org/10.1111/j.1540-5915.2002.tb01658.x>
- Terziovski, M., & Samson, D. (1999). The link between total quality management practices and organizational performance. *The International Journal of Quality & Reliability Management*, 16(3), 226. <http://dx.doi.org/10.1108/02656719910223728>
- Thornton, G. C. (2006). The relationship between supervisory and self-appraisals of executive performance. *Personnel Psychology*, 21(4), 441-455. <http://dx.doi.org/10.1111/j.1744-6570.1968.tb02044.x>
- Uwizeyemungu, S., & Raymond, L. (2010). Linking the Effects of ERP to Organizational Performance: Development and Initial Validation of an Evaluation Method. *Information Systems Management*, 27(1), 25-41. <http://dx.doi.org/10.1080/10580530903455122>
- Velcu, O. (2007). Exploring the effects of ERP systems on organizational performance: Evidence from Finnish companies. *Industrial Management & Data Systems*, 107(9), 1316-1334. <http://dx.doi.org/10.1108/02635570710833983>
- Wang, H., & Yen, Y. (2012). An empirical exploration of corporate entrepreneurial orientation and performance in Taiwanese SMEs: A perspective of multidimensional construct. *Total Quality Management*, 23(9), 1035-1044. <http://dx.doi.org/10.1080/14783363.2012.670917>
- Weill, P. (1992). The Relationship Between Investment in Information Technology and Firm Performance: A Study of the Valve Manufacturing Sector. *Information Systems Research*, 3(4), 307-333. <http://dx.doi.org/10.1287/isre.3.4.307>
- Wier, B., Hunton, J., & HassabElnaby, H. R. (2007). Enterprise resource planning systems and non-financial performance incentives: The joint impact on corporate performance. *International Journal of Accounting Information Systems*, 8(3), 165-190. <http://dx.doi.org/10.1016/j.accinf.2007.05.001>
- Yasin, M. M., Kunt, J. A. M., & Zimmerer, T. W. (2004). TQM practices in service organizations: An exploratory study into the implementation, outcomes and effectiveness. *Managing Service Quality*, 14(5), 377-389. <http://dx.doi.org/10.1108/09604520410557985>

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