International Journal of Innovation, Creativity and Change. www.ijicc.net
Volume 8, Issue 8, 2019

The Supply Chain Management, Enterprise Resource Planning Systems and the Organisational Performance of Thai Manufacturing Firms: Does the Application of Industry 4.0 Matter?

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This study aims to assess the indirect or direct contribution of enterprise resource planning in organisational performance. In particular, the study tries to capture the indirect effects posed by enterprise resource planning on organisation performance through supply chain management practices. Through such mediation effect, the existence of a positive association among organisational performance and enterprise resource planning explains that supply chain management plays a significant role to restore the organisational benefits that can be obtained through investing in information technology. The current study has employed the SEM-PLS as a data analysis technique. In social science studies, the issue of non-normal data may become an issue for the researcher. In this regard, the PLS-SEM is an ideal approach for data analysis. This paper presents that SCM stimulates the association among organisational performance and enterprise resource planning, such that SCM acts as a process of integrating ERP as an input and creating better organisational performance as an output. Another contribution of this study is that several experts and researchers mix the concepts of organisational performance and enterprise resource planning, thereby ignoring a considerable contributory role of supply chain management in the organisational performance enhancement. The results indicate that the industry 4.0 of smart factories that are based upon collaborative cyber-

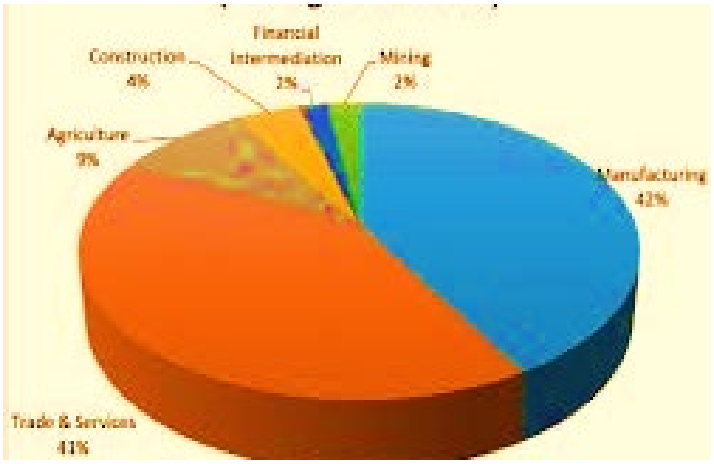
physical systems, indicate the future industrial network. Through employing plug-and-produce systems and smart sensors, the assembly systems enable to change the setup sequence and processing of operations, in accordance with the capacity utilisation and actual order inflows.

Key words: *Supply chain, Enterprise resource planning, industry 4.0, Thailand.*

Introduction

Business organisations have been facing various challenges arising from a dynamic business environment. Nowadays, firms are entering into more challenging and modern competitive business environments from the traditional businesses (Barratt, 2016; Haseeb, Hussain, Slusarczyk, & Jermsittiparsert, 2019; Haseeb, Hussain, Kot, Androniceanu, & Jermsittiparsert, 2019). Emergence of information technology has brought changes in the organisational roles and strategies, particularly on the inter-firm linkages that is in the delivery and supplies within a supply chain. Resultantly, an organisations' success depends largely upon the organisation's individual performance, as well as on the network of firms that are associating with each other through different channels. Other than changes in the global business environment, supply chain design is also acquiring key significance as the basic supply chain capability. In the meantime, enterprise resource planning (ERP), a business-driven occurrence, is also conquering the ever-changing business environment. The ERP system adoption is regulated by the partners and customers demand for the upgradation of the SC system, the competitors' pressure or by the need to bring reforms or transforming the existing legacy. Initially, both SCM and ERP offer various organisational dimensions. However, adopting information technology into a supply chain management demands the adoption of the ERP system into the SCM. According to Polowczyk and Baum (2018), the integration of the ERP system is considered to be an essential and natural process for a firm to stay competitive in terms of managerial and strategic consideration in a competitive environment. Several prior studies have shown the significance of SCM (Alrubaian et al., 2018). Therefore, the need for more executives and managers is increasing for performance enhancement, improvement in SCM efficiency and for encouraging the achievement of competitive advantage, particularly during complicated business relationships and challenging business environments. Complex and challenging business environments demand effective ERP implementation and agile and responsive supply chain management (Sulkar, Tashjian, Chalmers, & Henninger, 2019). The study is being carried out on the manufacturing sector of Thailand, which is the largest sector and accounts for a 42 percent share, as per the Thai National and Economic Social Development Board report 2018.

Figure 1. Key sectors in the Thailand



Source: National economic and social development board of Thailand

Supply chain management is generally influenced by the disruption risks and digital technology; thus, an interrelation is expected among supply chain and digital technology. Such as, additive manufacturing would result in the manufacturing of components, modules or end products at any place within a supply chain (Khajavi, Partanen, & Holmström, 2014). It signifies that fewer suppliers or supplier layers, reduction in the requirement of transportation and supply chain design, act as potential threats for the logistic firms.

The present study aims to assess the indirect or direct contribution of ERP in the organisational performance (OP). In particular, the study tries to capture the indirect effects posed by ERP on the organisation performance through SCM. Through such mediation effect, the existence of a positive association among organisational performance and ERP explains that SCM plays a significant role to restore the organisational benefits that can be obtained through investing in information technology.

Recent literature (De Bhowmick, Sarmah, & Sen, 2019; Klünder, Reder, & Steven, 2016; J. M. Müller et al., 2018) has also shown that industry technology brings flexibility in manufacturing and demand, better capacity utilisation, product diversification, shorter lead times, and greater market responsiveness. The present research fills the gap in the literature by integrating and considering the organisational performance and digitalisation's impact on SCM. Thus, the impact of the industry 4.0 as a moderator in the relationship.

Hypothesis Development

In various industries, managers — particularly from the manufacturing sector — have been striving to control the SC functioning more efficiently and effectively. For this purpose, managers tend to adopt various effective techniques and methods, including just in time

(JIT), ERP, lean production, and total quality management (TQM) (Jermsittiparsert, Namdej, & Sriyakul, 2019; Saengchai & Jermsittiparsert, 2019; Sriyakul, Umam, & Jermsittiparsert, 2019). With effective SCM and information advantage, firms can better achieve effective control on suppliers. Considering this, various organisations around the world are making huge IT investments for transforming the global and domestic business structure. A large number of firms have already adopted an ERP system or intend to adopt this system. However, the ERP system is designed particularly for developing a harmony among business processes, i.e. production planning and order entry throughout the company or SC, as well as for the optimal enhancement of these processes (Mabert, Soni, & Venkataramanan, 2001). The IT investments allow a considerable amount of information and data sharing within the SC, thereby allowing real-time collaboration and enhancing the system of inventory distribution and management within the firms. Researcher Vanichchinchai (2019) has highlighted and stated the significance of ERP, including that it enables information and data transmission and processing, which plays an important role in enhancing SCM competencies and decision making, simultaneously. Furthermore, multiple ERP equipped firms have attempted to extend the ERP's scope for integrating their suppliers and customers to enhance SC functionalities and to deliver e-commerce and business services (Ahmad, Haleem, & Ali Syed, 2014).

Batchelor (2018) stated that the ERP system capabilities in a SC have not been adequately explored. Huge capital investment has been made for the purchasing, adoption, and upgradation of the ERP system, although, the ERP implementation objective has rarely been accomplished to the satisfactory level. In a study, an insignificant effect of the ERP system was found in improving and enhancing the SC performance, since ERP systems were expected to be capable of integrating essential functions of the organisational system (Costa, Ferreira, Bento, & Aparicio, 2016), making ERP partially applicable on the SC partners. In the same context, Ali and Miller (2017) suggested that the adoption of an ERP system simultaneously obstructs and facilitates the supply chain integration. Alternatively, several academic researchers have confirmed that a significant association exists among SCM performance and ERP. Moreover, these empirical studies have tried to analyse means for integrating ERP modules into SCM, particularly to plan, execute and manage materials, items, resources and operations within a SC. Based on the literature, the current research emphasises upon the SCM performance and ERP relationship in the manufacturing sector of Thailand. The first proposed hypothesis is as follows:

H1: The ERP has a significant impact on the SCM

The main concern of making an investment in ERP is to achieve non-financial (organisational effectiveness and efficiency) and financial performance (Badewi, Shehab, Zeng, & Mohamad, 2018). Wherein, the firm's financial performance relates to the profitability of a

firm, which can be measured through making financial assessments such as determining the ratio return rate. Whereas, knowledge management, customer service, product reliability and other organisational performances which may ultimately influence profitability, fall in the category of non-financial performance. Thus, in view of Smith and Bititci (2017), non-financial performance measurement fills the financial accounting gap to present a blended picture of a firm's performance. In the past few years, a significant number of firms have adopted performance measurement frameworks that could cover both non-financial and financial performance. One such example is the Kaplan and Norton's Balanced Scorecard (BSC).

The ERP system is also assumed to contribute in enhancing the firm's non-financial efficiency, resulting in better financial performance, and improvement in the efficiency of the information system within an organisation. A few researchers have supported the ERP system's contribution of directly enhancing the organisations' financial performance, because of the lower IT infrastructure cost (Nwankpa, 2015). Similarly, Porta Pavin and Klein (2015) conducted a field study which validated several direct ERP implementation effects on the non-financial and financial performance of an organisation. He argued that ERP system implementation may lead to more accurate prices, resulting in better maintenance of the profit margin. Besides, the adoption of an ERP system reduces the expected number of errors in the inferred prices, which leads to revenue improvement. In the business industry, adopting an ERP system may contribute to the economies of scale, which forbids inventory selling and cost and administrative and general expenses, partly because of the modification in a firm's structure while considering the ERP system adoption. Contrarily, reliable evidence has been obtained through recent research regarding the benefits gained through considerable IT investments, and the productivity gains obtained from these benefits. For instance, in a case study by Tenhiälä, Rungtusanatham, and Miller (2018) on ERP system implementation, the effects of the ERP system on an individual firm's performance were reported. This study also presented the evidence about the causal association among IT adoption and organisational performance improvement. In addition, it also exhibited the timescale of the assumed advantages. In another study, Egdair, Rajemi, and Nadarajan (2015) have analysed the association among ERP and OP, by employing an experimental approach. Their study presented a hypothetical case of 63 verified analysts and scholars from financial service providing companies. These analysts' achievements were reviewed and found to be in accordance with the forecasts which the hypothetical organisation is insistent to make i.e. IT investment in the form of ERP system implementation. If the positive earnings are confirmed by the results, then it can reinforce the proposed hypothesis claiming that ERP implementation poses positive effects on the performance. In addition, Marika, Litondo, and Njihia (2018) have proposed a theoretical model which indicates the positive impact of ERP implementation on the intellectual capital of a company, also known as process capital.

Therefore, process capital influences the customer capital, which in turn affects the business performance.

Several other studies have also confirmed that ERP positively affects the organisational performance. In view of Ahmed, Taha, & De Vigal Capuno (2018), the ERP system's positive contribution occurs mainly as a result of improvement in information exchange, enabling firms to quickly respond and enhance the inventory management. On the other hand, the author suggested the contribution of the ERP system in cost reduction, thereby enhancing the overall revenue generation. In addition, various other scholars (Sabherwal & Jeyaraj, 2015; Tarhini, Ammar, Tarhini, & Masa'deh, 2015; Teng & Lu, 2016) have also validated in their studies that ERP implementation and OP are positively associated. Therefore, it can be summarised as the ERP implementation is expected to bring direct effects in the company's performance. Thus, the second hypothesis is proposed as:

H2: ERP has a significant impact on the OP

Supply chain management is a systematic and strategic coordination between business functions and strategies by a firm and the strategies by other businesses operating within a SC, for stimulating long-term single firm performance, as well as for the whole SC. During last two decades, the primary focus of SCM was to protect the interdependence of the customer and the organisation. It also promotes collaboration within the supply chain with a purpose to improve the performance of the SC as a whole. In recent years, this area has drawn considerable interest by the practitioners and academicians (Alam, 2016; Lii & Kuo, 2016).

In the modern business environment, regardless of the continuous international and domestic threats and pressures, the increase of globalisation has posed a serious challenge upon firms — to strive for an effective mean for acquiring and retaining a competitive position in a competitive market (S. Li, Zhao, & Huo, 2018). A major SCM benefit is the development of downstream and upstream linkages. Furthermore, several measures have been taken by the firms for incorporating customer-supplier-firm relationship with the contextual factors internal to the firm for enhancing customer satisfaction, organisational performance and competitiveness. SCM also offers business opportunities and close coordination for the customers and suppliers to efficiently and effectively increase the product availability in the market (Fernandes, Sampaio, Sameiro, & Truong, 2017). A significant advantage of a successful implementation of SCM is that it improves the association among customers in the downstream and suppliers in the upstream, which ultimately lead to optimal performance of the organisation as well as customer satisfaction.

According to Prajogo, Oke, and Olhager (2016), a number of prior research studies confirmed the SCM's direct or indirect contribution in the organisational performance using various SC strategies and practices. Moreover, literature review suggests SCM to be a strategic vision that is based upon theories of efficient leadership and communicating and developing collaborative vision in terms of strategic SCM. This developed vision combined with strategic planning, require supportive business processes for customer satisfaction, which can be visualised in OP. Besides, academic researchers (Ajamieh, Benitez, Braojos, & Gelhard, 2016; Laihonen & Pekkola, 2016) also provided evidence to support the positive association among organisational performance and supply chain management (SCM). Therefore, based on the above discussion, the third hypothesis is proposed as:

H3: SCM has a significant impact on the OP

Literature has shown a positive effect of ERP on SCM and on the OP (Talib, Siddiqui, & Khanam, 2016). Therefore, it can be hypothesised that OP and ERP are indirectly linked to each other with SCM causing a mediating effect on this linkage. Thus, the fourth hypothesis is proposed:

H4: SCM mediates the relationship between ERP and OP

A majority of the studies employed factory concepts which have similar smart networking features. Industry refers to a networking concept for smart manufacturing, in which products and machines tend to engage without the interference or control of humans. In such networks, supply chains possess dynamic structure with evolving nature. While a few scholars categorise digital technologies into production individualisation and manufacturing flexibility using industrial technology, others cover it in the context of industry. The present study considers the former perspective. The product individualisation in the manufacturing sector demands a set of different technological operations. Meanwhile, the industry technology allows to employ new strategies using a cyber-physical system, which has its roots in a highly customised system with a flexible design of manufacturing processes (J. M. Müller, Kiel, & Voigt, 2018; Perales, Valero, & García, 2018). The recent factory concepts have similar smart networking attributes, making it a crucial area of considering SCs in the form of cyber-physical systems. This system integrates the elements of material and information systems which facilitate in making cohesive and integrated decisions. In view of Ivanov (2018), these systems grow by reconfiguring and adapting their structures, such as using structural dynamic process. The industry of smart factories that are based upon collaborative cyber-physical systems, indicate the future industrial network.

Through employing plug-and-produce systems and smart sensors, the assembly systems enable to change the setup sequence and processing of operations, in accordance with the

capacity utilisation and actual order inflows (G. Li, Hou, & Wu, 2017). In a semi-conductor industry, the robots and unified pods technology are generally employed in a real-time operation sequencing. Mönch, Uzsoy, and Fowler (2018) have stated that such collaborative robots use tags and sensors to read product information and that flexibly decide where to send the wafer batch. In addition, Amazon also attempted to acquire a patent for a robot that is self-learning with a packaging system, enabling the robot to pick-up the ordered items and to also pack them.

Recent literature (De Bhowmick, Sarmah, & Sen, 2019; Klünder, Reder, & Steven, 2016; J. M. Müller et al., 2018) has also shown that industry technology brings flexibility in manufacturing and demand, better capacity utilisation, product diversification, shorter lead times, and greater market responsiveness. Furthermore, a number of intersection points were also identified between SCM and industry by Simota, Tupa, and Steiner (2017). Thus, the study is planned to examine the role of industry 4.0 in the relationship between ERP and OP.

H5: Industry 4.0 moderates the relationship between the ERP and OP

Methodology

This study intends to analyse the impact of ERP on the organisational performance, having a mediating role of SCM capabilities and the moderating role of the industry 4.0. Thus, the present study mainly covers the three important dimensions: the SCM competencies, ERP system, and organisational performance (OP). Ul-Ain, Giovanni, DeLone, and Waheed (2019) have put forward an ERP model to be used as an independent variable for assessing the ERP system's performance. They also divided ERP measure in six categories: system quality (ERP1) for estimating the extent of information processing; information quality (ERP2) for estimating the ERP's output level; System Use (ERP3) for estimating the level of information system by the recipient; User satisfaction (ERP4) for estimating the recipient response level to the usage of output for information system; individual impact (ERP5) for estimating the extent of information and data's impact on the recipient's behaviour; and the organisational impact (ERP6) for estimating the extent of information and data's impact on the output of an organisation.

The definitions presented by various scholars on SCM competencies, particularly as a mediating variable, have significantly emerged from the Logistics Framework. The three SCM competencies that are proposed in this research as independent variables are named as: 1) organisational SCM, which refers to the management of operative order among SC partners and company; 2) planning and control, which represents as the information systems for providing support to different organisational arrangements that are required to offer varied market segments, as well as the ability of improving the system of evaluation, which

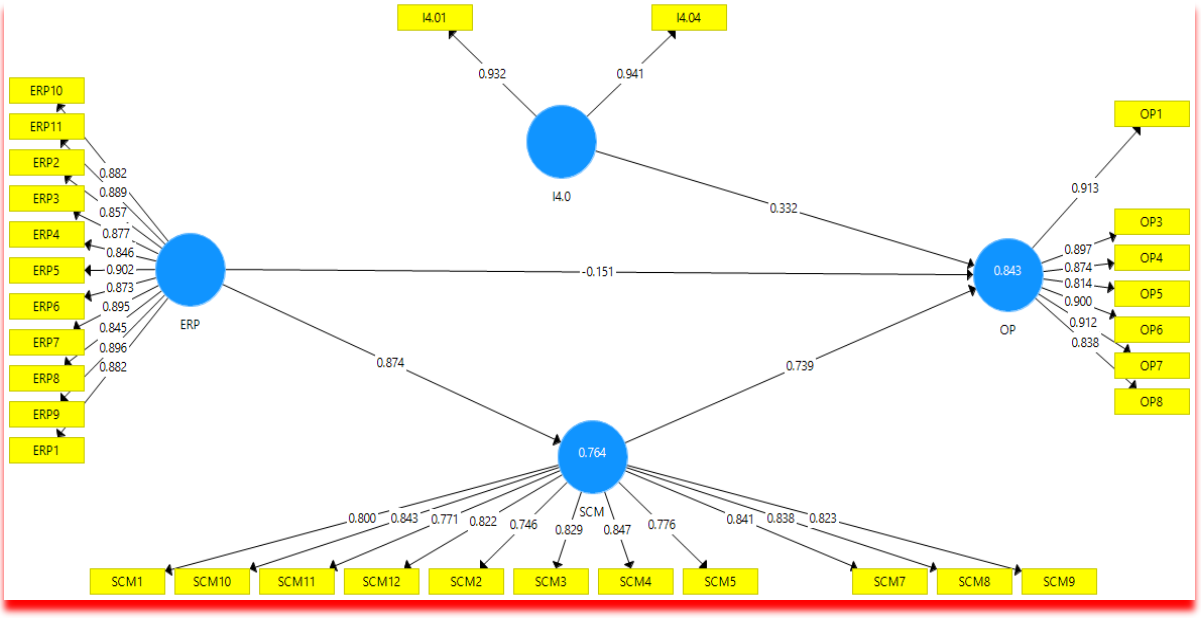
facilitates in strategies and process simplification; and 3) customer and relationship processes which represents the capacity and capability of making progress as well as maintaining a conceptual structure shared among customers and suppliers regarding collaboration principles and inter-organisational dependency.

A scale was extracted from a study by Yang, Yu, Liu, and Rui (2016) to measure the organisational performance. For the organisational performance, three elements were chosen: 1) financial performance, which includes cash-flows, return on investment, cost control and profitability, and are indicative of the company's success in its business objectives; 2) market performance, which indicates the product's and business plan's success both in future and current businesses, and it can be measured using the three factors of market development, market share, and product development; and 3) partnership performance, which is referred to as the achievement of a firm's goals and objectives in terms of its partners, and the stability, strength and sustainability of linkages among them. The measurement scale used in this study is adapted from prior studies.

Results

In social science studies, the issue of non-normal data may become an issue for the researcher. In this regard, the PLS-SEM is an ideal approach for data analysis. PLS-SEM is superior to CB-SEM, but there is similarity in both the approaches (Chuang, Shen, & Judge, 2016). In both approaches, two steps are involved. However, the measurement model is estimated in the PLS-SEM initially and later the structural model is determined (Henseler, Hubona, & Ray, 2016). The statistical elements are determined in the measurement model. It ensures that the model can be processed for further statistical analysis. In this research, the measurement model has been determined using the reliability, convergent validity, discriminant and construct validity through SmartPLS.

Figure 2. Measurement model



The value of outer loading is considered acceptable when it is equal or greater than 0.50 (Hair, Sarstedt, Hopkins, & G. Kuppelwieser, 2014). When the outer loading is less than 0.50, the items with the lowest value are deleted to improve the quality of data. The loading values are presented in Table 1 for this study. The results indicate that the range of item loading lie in the range of 0.749-0.950.

Table 1: Outer loading

	ERP	I4.0	OP	SCM
ERP10	0.882			
ERP11	0.889			
ERP2	0.857			
ERP3	0.877			
ERP4	0.846			
ERP5	0.902			
ERP6	0.873			
ERP7	0.895			
ERP8	0.845			
ERP9	0.896			
I4.01		0.932		
I4.04		0.941		
OP1			0.913	
OP3			0.897	
OP4			0.874	

OP5			**0.814**	
OP6			**0.900**	
OP7			**0.912**	
OP8			**0.838**	
SCM1				**0.800**
SCM10				**0.843**
SCM11				**0.771**
SCM12				**0.822**
SCM2				**0.746**
SCM3				**0.829**
SCM4				**0.847**
SCM5				**0.776**
SCM7				**0.841**
SCM8				**0.838**
SCM9				**0.823**
ERP1	**0.882**			

Before measuring the validity, the reliability of the model is checked. It is referred, as the level with the measures of the model is error-free and gives consistent results (Hosany, Prayag, Deesilatham, Cauševic, & Odeh, 2015). The issue of errors of measurement is handled through multi-scale items (Hosany et al., 2015). The items with errors of measurement are omitted in order to improve the scale reliability using multi-item scales. The method used for measuring the reliability is referred to as internal consistency (Hair et al., 2014; Hosany et al., 2015). It measures the level with which the same construct is captured by the items of one scale (Clossey et al., 2019). The internal consistency is measured through CR (composite reliability) (Hair et al., 2014). The CR value is similar to Cronbach's alpha (CA). The results of the measurement model of the study have been depicted in Table 1, 2, and 3, which show that all the values of CA are greater than the standard 0.70 (Hair, Hult, Ringle, & Sarstedt, 2016; Henseler et al., 2016; Sarstedt, Hair, Ringle, Thiele, & Gudergan, 2016). This reflects that there is a high internal consistency in every construct. As per the recommendation of Lonial and Carter (2015), the value in the range of 0.7-0.9 is considered satisfactory. The value higher than 0.9 is not appropriate, as it shows that most of the variables measure the same phenomenon (Hair et al., 2014). The discriminant and convergent validity are used to assess the construct validity.

Table 2: Reliability

	Cronbach's Alpha	rho_A	CR	(AVE)
ERP	**0.970**	**0.971**	**0.973**	**0.769**
I4.0	**0.860**	**0.863**	**0.935**	**0.877**
OP	**0.951**	**0.952**	**0.960**	**0.773**
SCM	**0.948**	**0.949**	**0.955**	**0.661**

The validity of a specific item is ensured through loadings and cross loadings. However, it is a condition to ensure the convergent validity. An item with higher loading in its construct is considered a good indicator of that construct. However, when the item shows high loading for a different construct, it reflects an issue with the item. The results ensure there is construct validity in the model. As per the suggestion of Tzempelikos and Gounaris (2017), the value of AVE higher than standard 0.50 should be determined. It was suggested by Hair et al. (2011) that the value of ACE and CR (composite reliability) should be greater than the standard value 0.70. The difference in the various constructs is determined through discriminant validity. Two measures are used in PLS-SEM method for determining the discriminant validity. It is determined to ensure the model's external consistency. It was noted by Tzempelikos and Gounaris (2017) that when the value of square root for each construct is higher than the greatest value of correlation with another construct, then it confirms discriminant validity.

Table 3: Validity matrix

	ERP	I4.0	OP	SCM
ERP	**0.877**			
I4.0	0.745	**0.837**		
OP	0.708	0.774	**0.879**	
SCM	0.774	0.766	0.774	**0.813**

After the assessment of the model, the structural model is assessed. It evaluates the correlation among the variables and regression. It was recommended by Hair et al. (2016) that five steps are included in the process of assessing the structural model. The initial step is to assess the collinearity. The second step is to find the significance of relations in the structural model. The third step is to estimate the regression coefficient, which is regarded as R2. The fourth step is to estimate the effect size referred to as F2. The fifth step is to estimate effect sizes (q2). Moreover, the mediation impacts are also analysed in the study.

Figure 3. Structural model

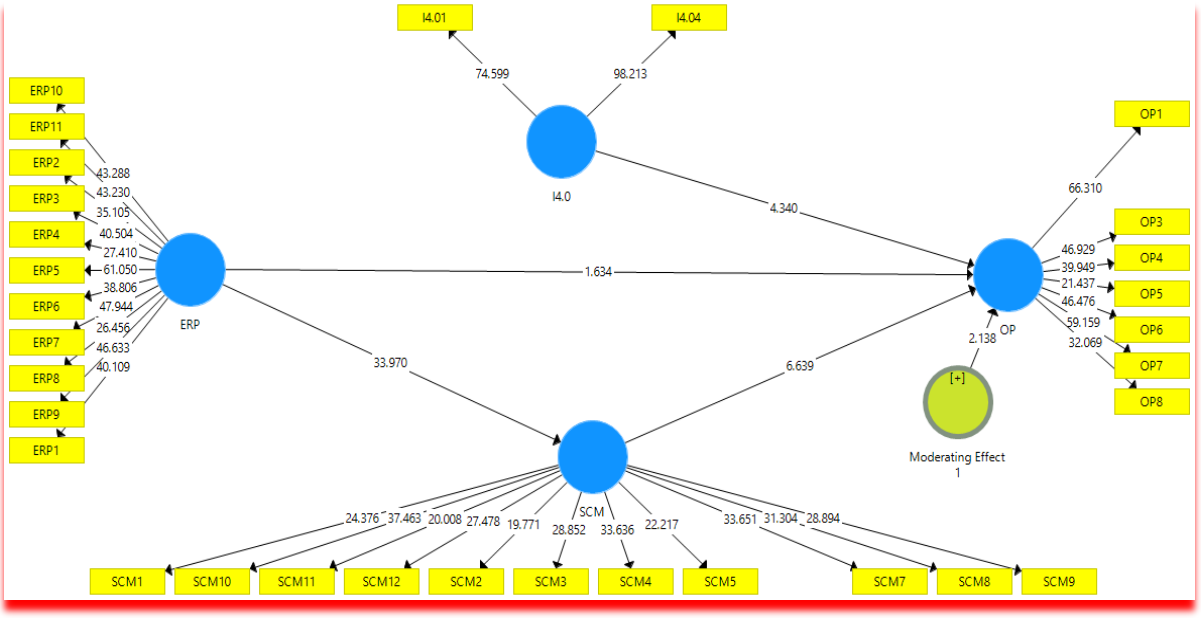
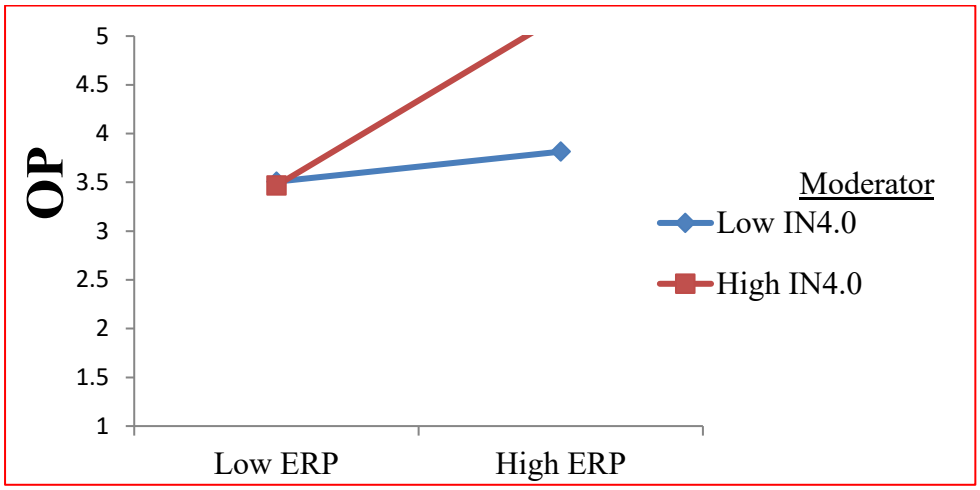


Table 4: Moderating and direct impact

	(β)	(M)	SD	T Statistics	P Values	Decision
ERP -> OP	0.513	0.517	0.084	6.079	**0.000**	**Accepted**
ERP -> SCM	0.874	0.875	0.026	33.970	**0.000**	**Accepted**
I4.0 -> OP	0.339	0.338	0.078	4.340	**0.000**	**Accepted**
Moderating Effect 1 -> OP	0.359	0.360	0.067	2.138	**0.016**	**Moderation**
SCM -> OP	0.754	0.742	0.114	6.639	**0.000**	**Accepted**

Figure 4. Moderating effect



It is evident from the figure 4, the industry 4.0 moderates the relationship between ERP and OP.

The t-value has been calculated using a sample of 5000 bootstrap (Hair et al., 2014). The critical values were used for determining the level of significance. The coefficient of determination assesses the model's predictive accuracy. It is calculated by taking the square of correlation among the predicted and actual values of the dependent variable.

Table 5: Mediating impact

	(β)	(M)	SD	T Statistics	P Values	Decision
ERP -> SCM -> OP	0.659	0.649	0.101	6.524	**0.000**	**Mediation**

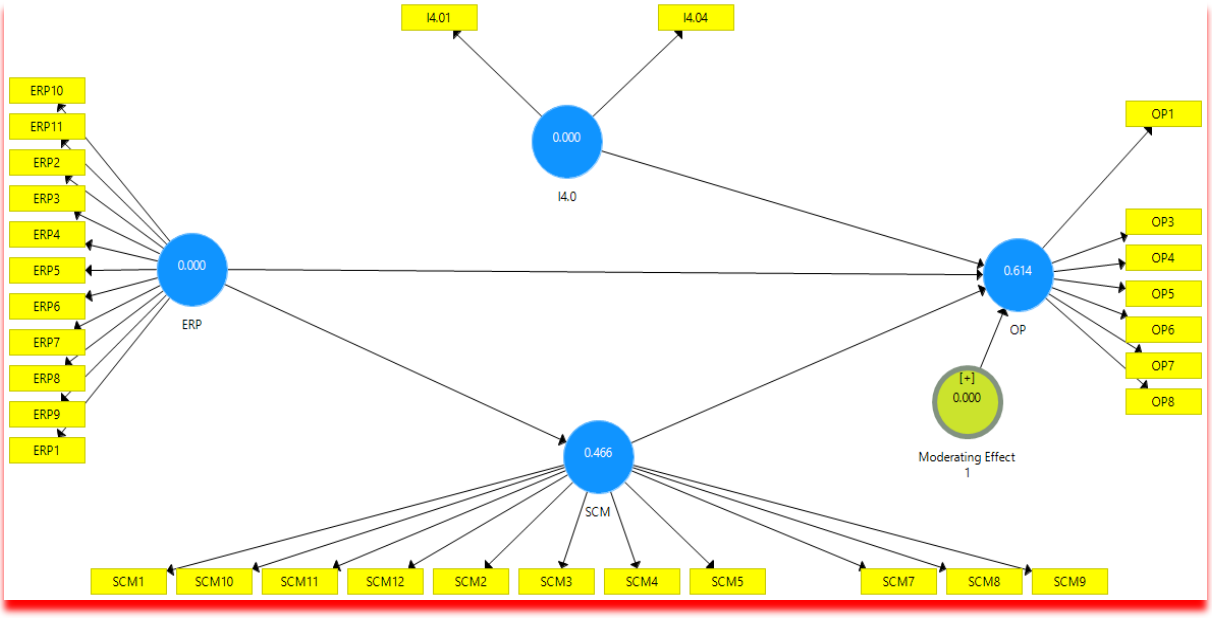
The combined influences on the dependent variable created by the independent variables represent the coefficient (Hair et al., 2014). The range of R2 is 0-1. The standard value of R2 is not set. However, it has been suggested by Hair et al. (2016) that when the value of R2 is 0.7, it is strong and when the value is 0.24, it is weaker. The value is moderate if it comes near 0.5. When the value of R2 is high, it reveals that a higher percentage of variations in the endogenous latent variable are explained by the latent exogenous variables.

Table 6: R-Square

	R Square
OP	0.543
SF	0.764

After estimating the coefficient of determination, the effect size has been determined to find the predictive relevance. It refers to the predictive ability of the structured model. The value of Q2 shows the model's predictive relevance (Hair et al., 2014).

Figure 5. Blindfolding



When its value is higher than zero, this reflects the predictive relevance of the path model. However, when the value is negative, there is no model's predictive relevance. The value of Q2 has been calculated using the process of blinding, which has been shown in the table.

Table 7: R-Square

	SSO	SSE	Q^2 (=1-SSE/SSO)
ERP	2,387.000	2,387.000	
I4.0	434.000	434.000	
Moderating Effect 1	217.000	217.000	
OP	1,519.000	586.955	0.614
SCM	2,387.000	1,275.401	0.466

Conclusion

The outcome obtained from this study validates that a significant positive association exists among OP and ERP system adoption. Similar results were obtained in several prior empirical research studies (Tarhini et al., 2015; Teng & Lu, 2016). The next finding obtained through SEM has confirmed that ERP positively affects the SCM. Thus, a firm's SCM capability can be significantly improved by adopting an ERP system. It is in-line with the outcomes obtained. However, it has been found that the ERP system directly and indirectly influences the SCM. Subsequently, the obtained outcomes have provided sufficient statistical evidence, indicating that SCM and OP are related to each other, such that the organisational performance causes an influence on the SCM. Thus, the study concludes that adopting SCM

may result in the assumed outcomes. This finding is also found to be in-line with the studies by Gunasekaran et al. (2017) and Dubey et al. (2018). These studies also indicated the direct and positive association among OP and SCM. Hence, the present research promotes to incorporate SCM into the implemented system for improving a firm's performance. Finally, the fourth outcome is related to this study's theoretical contribution. The results have confirmed the SCM's role as a mediating variable in the OP and ERP relationship. This finding also explains that significant association exists among ERP and organisational performance, having significant indirect effects as compared to direct effects. Thus, this paper presents that SCM stimulates the association among OP and ERP, such that SCM acts as a process of integrating ERP as an input and creating better organisational performance as an output. Another contribution of this study is that a number of experts and researchers (O. Müller, Fay, & vom Brocke, 2018; Shen, Chen, & Wang, 2016) mix the concepts of OP and ERP, thereby ignoring a considerable contributory role of supply chain management in the organisational performance enhancement.

This study aims to assess the indirect or direct contribution of ERP in the organisational performance. In particular, the study tries to capture the indirect effects posed by ERP on the organisation performance through supply chain management practices. Through such mediation effect, the existence of a positive association among organisational performance and ERP explains that supply chain management plays a significant role to restore the organisational benefits that can be obtained through investing in information technology. The current study has employed the SEM-PLS as a data analysis technique. In social science studies, the issue of non-normal data may become issue for the researcher. Another contribution of this study is that a number of experts and researchers (O. Müller, Fay, & vom Brocke, 2018; Shen, Chen, & Wang, 2016) mix the concepts of OP and ERP, thereby ignoring a considerable contributory role of supply chain management in the organisational performance enhancement. The results indicate that the industry 4.0 of smart factories that are based upon collaborative cyber-physical systems, indicate the future industrial network. Through employing plug-and-produce systems and smart sensors, the assembly systems enable to change the setup sequence and processing of operations, in accordance with the capacity utilisation and actual order inflows.

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