Influence of Internal and External Factors on Supply Chain Information System Risk Management Implementation

Chaleeya Yang-Ngam[*1], Thitinan Chankoson[#2], Pornpimon Aodton[#3]
[1*] Faculty of Management Sciences, Valaya Alongkorn Rajabhat University under the Royal Patronage, Thailand
chaleeya@vru.ac.th
[2]Faculty of Business Administration for Society, Srinakharinwirot University, Thailand
E-mail: tchankoson@gmail.com
[3]School of Tourism and Hospitality Management, Suan Dusit University, Thailand
E-mail: progress.aod2019@gmail.com

Abstract--- Risk management is major part of every enterprise. Proper risk management in all the department of an organization is one of the guaranties of success. However, Indonesian supply chain companies are lacking in information system (IS) risk management implementation. These companies are facing internal and external issues due to which the performance of Indonesian supply chain companies is not up to the mark. Thus, the objective of this study is to examine the role of internal and external factors in supply chain IS risk management implementation. Thus, the data is collected by collaborating with supply chain employees in Indonesia. Accordingly, primary data is used in this study to approach end results. Results of the study highlighted that various internal and external factors have important relationship with supply chain IS risk management implementation. Internal factor namely; organization culture and management commitment have positive effect on IS risk management implementation. External factor, namely; competitive pressure also has important role. Additionally, organization structure is one of the factors which strengthen the positive relationship of management commitment and supply chain IS risk management implementation.

Keywords: *Supply chain, organization culture, organization structure, management commitment, information system, risk management.*

1. Introduction

Information system (IS) has vital role in the success of every organization [1-3] as external and internal information expediate innovation process [4] which has major role in organization success. Now a days, companies are focusing to introduce better and better IS system because it has important role in business success and competitive advantage [5, 6]. IS has major important in various supply chain related companies.

However, Indonesian supply chain companies are struggling with various issues of IS implementation [7]. Due to these issues, companies are unable to apply better risk management system. It is major element of supply chain companies [8] performance which is decreasing due to IS risk management issues. Logistic ranking of various countries is shown in the below Figure 1 in which Indonesia has lower performance.

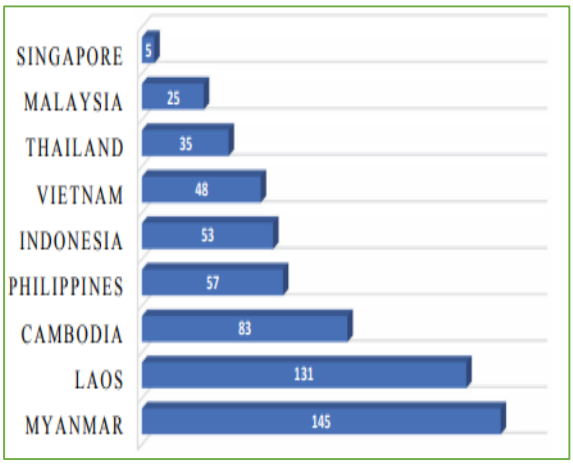


Figure 1. Logistic Performance Ranking
Source: Doktoralina and Apollo [9]

These issues can be resolved with focusing on various internal and external factors which effect on IS risk management implementation. Internal factor such as management commitment and organization culture is positive effect on IS risk management implementation [10]. Moreover, external factors like competitive pressure also influence on IS risk management implementation. Thus, companies should focus on these internal and external factors to cope IS risk management issues.

Internal and external factors are only helpful in case if the organizational structure is supportive. The organization structure should be flexible for implementation of various required strategies. Flexible organization structure has important contribution in organization [11-14]. Therefore, in the current study, organization structure is taken a moderating variable between internal factors, external factors and supply chain IS risk management implementation. Thus, the objective of this study is to examine the role of internal and external factors in supply chain IS risk management implementation.

Various researchers work on supply chain and risk management activities [15-17], however, these studies are missing with the role of internal and external factors to handle the issues of IS risk management implementation. Thus, this study filled the literature gap by examining the role of internal and external factors on supply chain IS risk management. Theoretical framework of the current study is shown in Figure 2.

2. Literature Review

Risk is a likelihood that how frequent something unfavourable is going to occur, and how much lose is probably going to result. The likelihood of loss can emerge out from combination of small risks and vulnerability factors. Supervisory Policy Manual (2000) mentions that risk is a circumstance that has a likelihood of occurring negative result of the business. Literature portray risk as any uncommon event that is probably going to influence the accomplishment of organizational targets.

In the current society, innovation considered a vital to achieve targets, which empowers the firm to utilize computerized IT to process data to help the firm in achieving the main goal and targets. Accordingly, an organization needs to secure its data resources, along these lines automatically shielding its central goal from IT-related risk [10]. IS risk management assuming an effective job to the accomplishment of goals. A productive IS risk management task is exceptionally required for fruitful IT security in company.

Hereafter IS risk management should not be viewed as a specialized activity that should be take care by IT specialists; it should be viewed as a critical management work.

IS risk management being the procedure that enables IT administrators to adjust the operational and monetary expenses of defensive measures and accomplish returns by ensuring the IS and information that help their organizations' missions. IS risk management including the use of risk management methods to oversee or alleviate the IS risk. These risks are identified with ownership, activity, utilization, and usage. The present examination centres around the elements that drive the IS risk management usage and various factors impact on the IS risk management implementation.

Fui-Hoon Nah, et al. [18] and Schechter and Smith [19] described that the significant objective of IS risk management is to build productivity through enhancing business procedures and decreasing the working expenses. Purna Sudhakar [20, 49-53], in his investigation of IS and programming advancement in U.S., reasoned that IS risk management upgrades and institutionalizes procedures of information and data inside the company with best practices. Institutionalization activities and information empower an organization to sum up working procedures, improve ability to spread new IS capacity, and decline IS running costs.

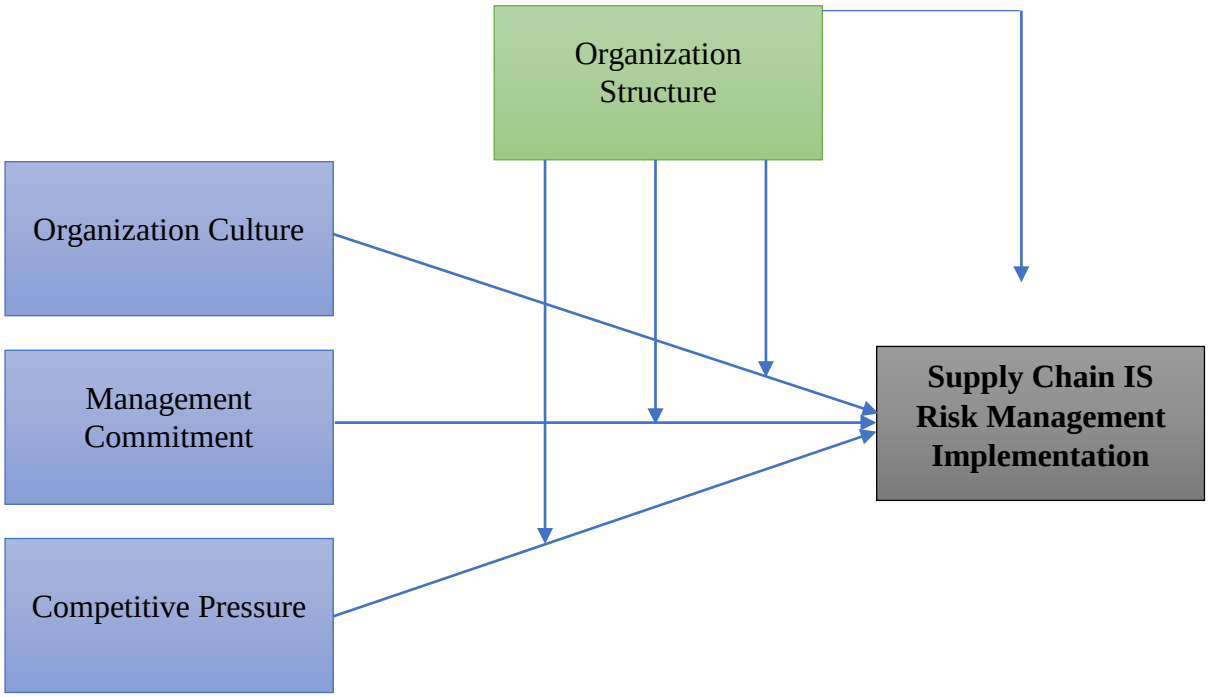


Figure 2. Theoretical Framework of the Current Study

Figure 3. Risk Management

Organizations use various strategies in risk management to avoid unfavourable events. As the risk management is most important element of any organization [21]. Most common risk management techniques are shown in Figure 3. First step is risk identification, second step is risk assessment, third step is risk analysis and fourth step are plaining implementation. This study only focused on fourth step, namely; risk implementation within the domain of IS.

Risk implementation is most crucial part of risk management strategy [22-24]. Because, risk management implementation is most crucial as compared to the identification and assessment. Most of the supply chain companies are focusing to proper implementation of risk management strategies to avoid future unfavourable events.

IS risk management implementation is the way toward recognizing vulnerabilities in the company IS and finding a way to guarantee privacy, and accessibility of the considerable elements in the IS. Halliday, et al. [25] explained that the major concern of IS risk management is to help the mission of the company. However, in the success of supply chain IS risk implementation, various factors are much critical which are the responsible of supply chain IS risk implementation. These factors include; organization culture, organization commitment and competitive pressure. Competitive pressure is an external factor; however, organization culture and organization commitment are internal factors.

2.1 Organization Culture and Supply Chain IS Risk Management Implementation

Grabowski and Roberts [26] carried out research about the issue of risk mitigation and turned out with a procedure to assist an organization. The analysts recognized organizational culture as a basic achievement factors for supply chain IS risk management implementation. Galorath [27], Galorath [28] considered the significance of risk management and assesses forms which are required for the successful implementation of IS risk management in SMEs. The investigation considered the basic achievement factors that impacts the IS risk management implementation as whole management of structure and procedures, social objective, and an example for estimation. Avison and Torkzadeh [29] work on organization's product advancement in New York and presumed that the achievement of the framework programming relies upon correspondence and culture. Thus, culture has important role in supply chain risk handling. Huang and Trauth [30] directed a meeting on twelve IS programming authority from U.S., China about programming advancement and implementation. They found organizational culture as the major basic achievement factor that impacts organizational programming risk management implementation, and that culture likewise diminishes clashes and enhances group effectiveness. Rai, et al. [31] recognized culture among other basic achievement factors as a determinant of IS programming venture implementation. Moreover, Remus and Wiener [32] examined basic achievement factors for risk implementation, they distinguished basic achievement factors with models comprise of both inside and outside management factors incorporating culture. Raisinghani, et al. [33] in their own commitment to learning recognized five basic achievement factors for software project implementation, such as risk investigation, culture, risk control implementation, legal control, and contracts.

Therefore, organization culture has important role in supply chain IS risk management. Risk mitigation culture engage the employees in risk identification and risk handling. Various studies mentioned that organization culture has significant association with risk implementation [34-36].

H1: Organization culture has a relationship with supply chain IS risk management implementation.

2.2 Management Commitment and Supply Chain IS Risk Management Implementation

Apart from organization culture, organization commitment is also most crucial in supply chain IS risk implementation. Dembo and Freeman [37] directed their investigation in U.S. to look at the idea of basic achievement elements to be implemented in a business situation. The variables considered in their examination incorporate top management support, coordinating risk management into basic leadership process, making efficiencies in techniques, and controls. Therefore, management commitment has relationship with supply chain IS risk implementation. Galorath [27] examined the significance of risk management and measures which are required for the successful implementation of IS risk management in SMEs. Moreover, management commitment increases the employees satisfaction [38] which effect positively on risk management.

Literature proved a significant relationship between management commitment and risk

management implementation [10]. Management commitment motivates the lower employees to work for risk identification, risk handling, risk plaining and finally risk implementation.

H2: Management commitment has a relationship with supply chain IS risk management implementation.

2.3 Competitive Pressure and Supply Chain IS Risk Management Implementation

Mahilum-Tapay, et al. [39] considered IT as an essential factor for IS risk management implementation so as to accomplish highly competitive position, which incorporates higher performance levels, globalization, and organizational advancement. Competitive perfection is possibly far and wide utilized term in management, yet it is insufficiently expressed and prepared. Literature shows three relationship designs between competitive edge and company's performance, namely; unique advantage important to advance performance, unique advantage without better performance, and greater performance without unique advantage. Ordóñez de Pablos [40] clarified the competitive favourable position of a worldwide organization. He examined that competitive advantage misleads an organization. In this direction competitive pressure reduces the ability to implement supply chain IS risk management. Sometime competitive pressure leads towards better supply chain IS risk management. Therefore, competitive pressure has a relationship with supply chain IS risk management.

H3: Competitive pressure has a relationship with supply chain IS risk management implementation.

2.4 Organization Structure

Organization structure has important role in any organization [14, 41-43] as it has important role in strategy making. Better organization structure supports the strategies for supply chain IS risk implementation. However, ineffective organization structure can be a constraint in the way of supply chain IS risk management implementation.

Grabowski and Roberts [26] carried out a research in united states about the risk mitigation problem and found a procedure to support high performance measures in an organization. The study recognised organizational structure as one of the most critical success elements for IS risk management implementation. Silver [44] inspected critical success elements in complex industrial projects and findings of study acknowledged organizational structure as a serious success factor. Moreover, another study carried out by DeLoach [45] in united states on risk imperative, found that organizational structure is the key critical success factor while implementing IS risk management. Additionally, it is also found by various studies that organization structural is important in IS risk management [26].

H4: Organization structure moderates the relationship between organization culture and supply chain IS risk management implementation.

H5: Organization structure moderates the relationship between management commitment and supply chain IS risk management implementation.

H6: Organization structure moderates the relationship between competitive pressure and supply chain IS risk management implementation.

Additionally, it is found that

H7: Organization structure has a relationship with supply chain IS risk management implementation.

3. Methodology

Research design is the process which is required to complete all essential data on the research and satisfactory investigation of results. Research design can be grouped into various research designs. The present examination utilizes cross-sectional research designs. With the end goal of the present investigation, surveys are utilized to acquire information. The present study, questionnaires are used to obtain data. For this purpose, a cross-sectional research design is used to observe the association between both independent as well as dependent variables.

Table 1. Multicollinearity

	VIF
Organization Culture	3.016
Management Commitment	2.025
Competitive Pressure	4.010
Organization Structure	1.023

Focus of this study is Indonesian supply chain companies. As this study investigated the role of internal and external organizational factors on supply chain IS risk management implementation, therefore, data were collected from the employees of supply chain companies in Indonesia. A questionnaires survey was carried out to collect the

opinion of supply chain employees about IS risk management implementation.

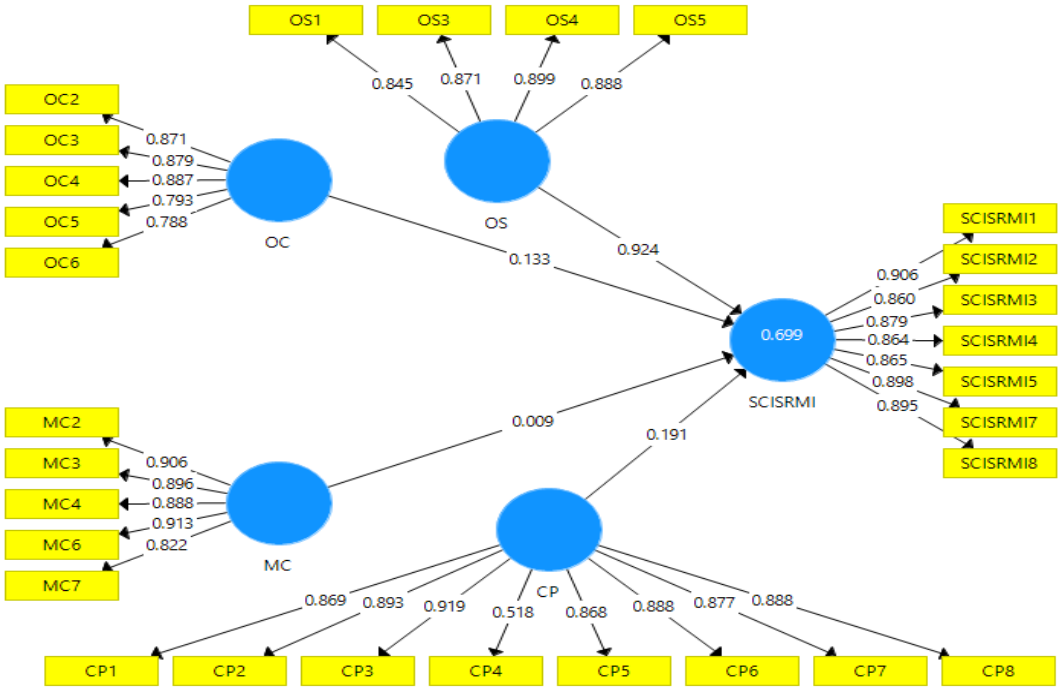


Figure 4. Measurement Model Assessment

Table 2. Confirmatory Factor Analysis

	CP	MC	OC	OS	SCISRMI
CP1	0.869				
CP2	0.893				
CP3	0.919				
CP4	0.518				
CP5	0.868				
CP6	0.888				
CP7	0.877				
CP8	0.888				
MC2		0.906			
MC3		0.896			
MC4		0.888			
MC6		0.913			
MC7		0.822			
OC2			0.871		
OC3			0.879		
OC4			0.887		
OC5			0.793		
OC6			0.788		

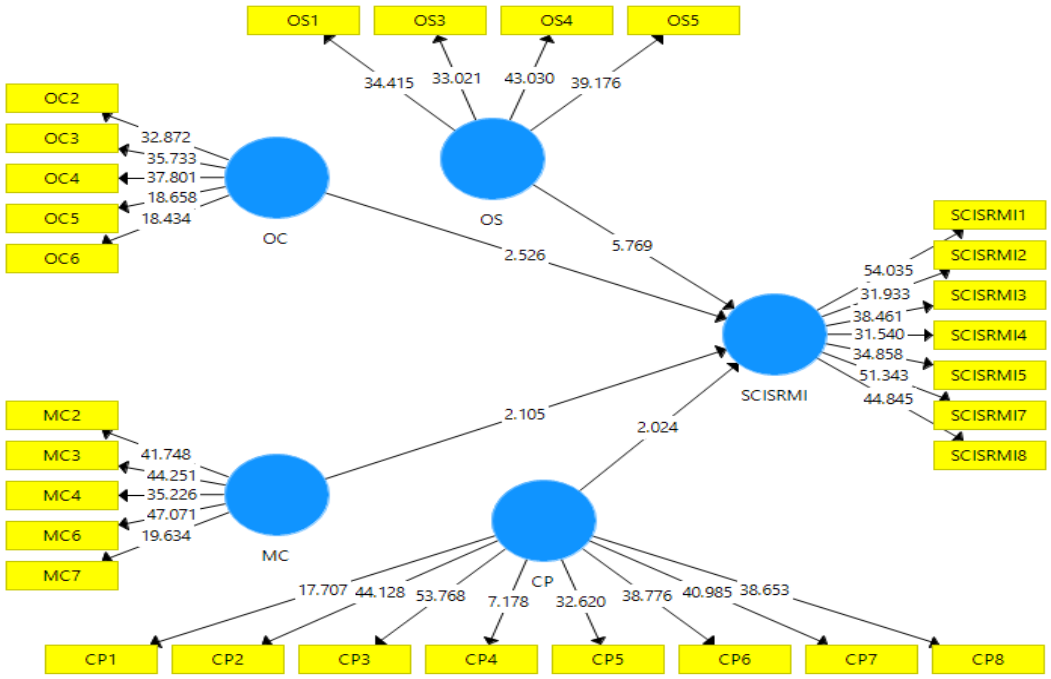
OS1	0.845	
OS3	0.871	
OS4	0.899	
OS5	0.888	
SCISRMI1		0.906
SCISRMI2		0.86
SCISRMI3		0.879
SCISRMI4		0.864
SCISRMI5		0.865
SCISRMI7		0.898
SCISRMI8		0.895

Table 3. Cronbach alpha, CR and Convergent Validity

	Cronbach's Alpha	**rho_A**	**CR**	**(AVE)**
CP	0.941	0.955	0.953	0.721
MC	0.931	0.936	0.948	0.784
OC	0.899	0.9	0.926	0.714
OS	0.901	0.923	0.93	0.767
SCISRMI	0.952	0.952	0.96	0.776

Table 4. Discriminant Validity

	CP	**MC**	**OC**	**OS**	**SCISRMI**
CP	**0.849**				
MC	0.606	**0.886**			
OC	0.624	0.883	**0.845**		
OS	0.804	0.598	0.620	**0.876**	
SCISRMI	0.722	0.545	0.578	0.828	**0.881**



q

Table 5. PLS bootstrapping

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
CP -> SCISRMI	0.191	0.19	0.091	2.024	0.041
MC -> SCISRMI	0.009	0.018	0.004	2.105	0.035
OC -> SCISRMI	0.133	0.137	0.053	2.526	0.011
OS -> SCISRMI	0.924	0.929	0.16	5.769	0.000

Table 6. PLS bootstrapping (Moderation)

	Original Sample (O)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Decision
CP* OS -> SCISRMI	0.213	0.131	1.601	0.071	No Moderation
MC* OS -> SCISRMI	0.029	0.012	2.395	0.029	Moderation
OC* OS -> SCISRMI	0.213	0.013	1.556	0.068	No Moderation

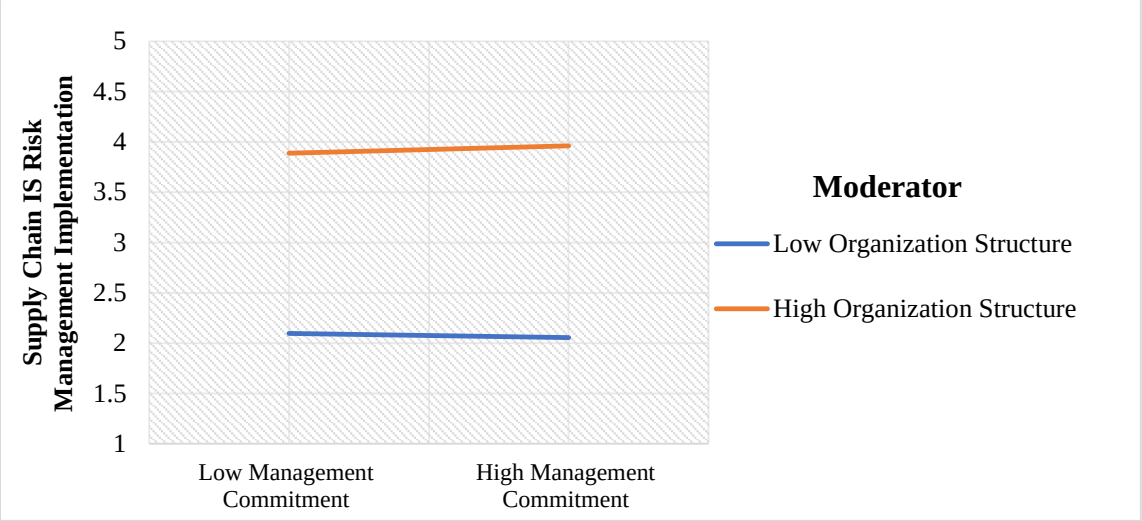


Figure 6. Moderation effect between management commitment and supply chain IS risk management implementation

Total 500 questionnaires were distributed among the employees. All the items for this study are adapted from various previous studies. Therefore, a scale was developed to collect the data. Moreover, preliminary analysis was carried out with the help of statistical software SPSS version 21. It is found that data has no missing value and outlier. Multicollinearity is examined with the help of VIF as given in Table 1. VIF value should not be above 5.0 [46].

4. Results

Each item that is planned to measure a construct should have higher loading in their construct, rather than to their loadings in various construct. Table 2 exhibits that every item has a loading more than .40 as proposed by Hulland (1999). However, few items are expelled from the data set.

Moreover, the elements of measurement model such as composite reliability (CR) and AVE have values above minimum level. It is found that CR for all constructs is above 0.7 and AVE is above 0.5 as suggested by Hair, et al. [47], shown in Table 3. Finally, discriminant validity is also given in Table 4.

Significance of path coefficient was examined with the help of bootstrapping technique. It is carried out with the help of PLS. Significance of path coefficient determined that whether hypotheses are supported or not supported by the study. In this direction, t-value and p-value is considered. Table 5 shows all the results of bootstrapping. It is found that all the direct hypotheses are significant as the t-value is above 1.96 and p-value is below 0.05.

Moreover, moderation effect is given in Table 6. It is evident that moderation effect is significant in case of management commitment and supply chain IS risk management implementation. However, it is not significant in other two cases. Therefore, H5 is accepted, however, H4 and H6 are not accepted.

Finally, r-square value is shown in Figure 4 which is 0.699. It means that all the variables are expected to bring 69.9% change in dependent variable which is substantial [48-55]. This is strong r-square values.

5. Discussion and Conclusion

Results of the study highlighted that various internal and external factors have important relationship with supply chain IS risk management implementation. Internal factor namely; organisation culture has significant relationship with supply chain IS risk management implementation. Better organization culture increases the risk management strategies.

The internal factor namely; management commitment also has significant role in risk management among Indonesian supply chain companies. Better organization commitment towards risk mitigation is positive role in supply chain IS risk management. Committed management

always make efforts to develop strategies to mitigate risk and motivate their employees for risk management. Moreover, the external factor, namely; competitive pressure also has important role in risk management. Competitive pressure assists the organization to make strategies for risk management and effect positively on risk management implementation. Moreover, the moderation effect of organization structure is given in Figure 6.

It is found that organization structure is one of the factors which strengthen the positive relationship of management commitment and supply chain IS risk management implementation. Thus, Indonesian supply chain companies should focus on internal and external factors to promote supply chain IS risk management implementation.

References

[1] G. G. Gable, D. Sedera, and T. Chan, "Re-conceptualizing information system success: The IS-impact measurement model," *Journal of the association for information systems*, vol. 9, no. 7, p. 18, 2008.

[2] K. Kasemsap, "The role of information system within enterprise architecture and their impact on business performance," in *Global Business Expansion: Concepts, Methodologies, Tools, and Applications*: IGI Global, 2018, pp. 1078-1102.

[3] N. Mayer, J. Aubert, E. Grandry, C. Feltus, E. Goettelmann, and R. Wieringa, "An integrated conceptual model for information system security risk management supported by enterprise architecture management," *Software & Systems Modeling*, pp. 1-28, 2018.

[4] W. U. Hameed, M. F. Basheer, J. Iqbal, A. Anwar, and H. K. Ahmad, "Determinants of Firm's open innovation performance and the role of R & D department: an empirical evidence from Malaysian SME's," *Journal of Global Entrepreneurship Research*, vol. 8, no. 1, p. 29, 2018.

[5] G. Gupta, K. T. L. Tan, Y. S. Ee, and C. S. C. Phang, "Resource-Based View of Information Systems: Sustainable and Transient Competitive Advantage Perspectives," *Australasian Journal of Information Systems*, vol. 22, 2018.

[6] C. Marnewick, W. Erasmus, and J. Nazeer, *The symbiosis between information system project complexity and information system project success*. AOSIS, 2018.

[7] Sijabat, R. (2018). Understanding Behavioral Economics: A Narrative Perspective. Asian Development Policy Review, 6(2), 77-87.

[8] S. Nadeem, A. K. Alvi, and J. Iqbal, "Performance Indicators of E-Logistic System with mediating role of Information and Communication Technology (ICT)," *Journal of Applied Economics & Business Research*, vol. 8, no. 4, 2018.

[9] C. Doktoralina and A. Apollo, "The contribution of strategic management accounting in supply chain outcomes and logistic firm profitability," *Uncertain Supply Chain Management*, vol. 7, no. 2, pp. 145-156, 2019.

[10] S. Fasilat, "The critical success factors for information system (IS) risk management implementation in the Nigerian banking sector," Universiti Utara Malaysia, 2015.

[11] Sethi, D., & Ghatak, S. (2018). Mitigating Cyber Sexual Harassment: An Insight from India. Asian Themes in Social Sciences Research, 1(2), 34-43.

[12] Y. E. Chan, "Why haven't we mastered alignment? The importance of the informal organization structure," *MIS Quarterly executive*, vol. 1, no. 2, pp. 97-112, 2002.

[13] E. M. Olson, S. F. Slater, and G. T. M. Hult, "The performance implications of fit among business strategy, marketing organization structure, and strategic behavior," *Journal of marketing*, vol. 69, no. 3, pp. 49-65, 2005.

[14] J. Child, "Organization structure and strategies of control: A replication of the Aston study," *Administrative science quarterly*, pp. 163-177, 1972.

[15] U. Jüttner, H. Peck, and M. Christopher, "Supply chain risk management: outlining an agenda for future research," *International Journal of Logistics: Research and Applications*, vol. 6, no. 4, pp. 197-210, 2003.

[16] D. J. Ketchen Jr and L. C. Giunipero, "The intersection of strategic management and supply chain management," *Industrial marketing management*, vol. 33, no. 1, pp. 51-56, 2004.

[17] P. Trkman and K. McCormack, "Supply chain risk in turbulent environments—A conceptual model for managing supply chain network risk," *International Journal of Production Economics*, vol. 119, no. 2, pp. 247-258, 2009.

[18] F. Fui-Hoon Nah, J. Lee-Shang Lau, and J. Kuang, "Critical factors for successful implementation of enterprise systems," *Business process management journal*, vol. 7, no. 3, pp. 285-296, 2001.

[19] Serfraz, A. (2018). Foreign direct investment inflows and labor productivity in Pakistan: A sector-wise panel cointegration analysis.

Asian Journal of Economics and Empirical Research, 5(1), 1-18.
[20] G. Purna Sudhakar, "A model of critical success factors for software projects," *Journal of Enterprise Information Management*, vol. 25, no. 6, pp. 537-558, 2012.
[21] W.-U. Hameed, F. Hashmi, M. Ali, and M. Arif, "Enterprise Risk Management (ERM) System: Implementation problem and role of audit effectiveness in Malaysian firms," *Asian Journal of Multidisciplinary Studies*, vol. 5, p. 11, 2017.
[22] K. Desender, "On the determinants of enterprise risk management implementation," in *Enterprise IT governance, business value and performance measurement*: IGI Global, 2011, pp. 87-100.
[23] H. J. Doueck, D. E. Bronson, and M. Levine, "Evaluating risk assessment implementation in child protection: Issues for consideration," *Child abuse & neglect*, vol. 16, no. 5, pp. 637-646, 1992.
[24] C. Källestål, "The effect of five years' implementation of caries-preventive methods in Swedish high-risk adolescents," *Caries research*, vol. 39, no. 1, pp. 20-26, 2005.
[25] S. Halliday, K. Badenhorst, and R. Von Solms, "A business approach to effective information technology risk analysis and management," *Information Management & Computer Security*, vol. 4, no. 1, pp. 19-31, 1996.
[26] M. Grabowski and K. H. Roberts, "Risk mitigation in virtual organizations," *Journal of computer-mediated communication*, vol. 3, no. 4, p. JCMC341, 1998.
[27] D. Galorath, "Risk management success factors," *PM World Today*, vol. 8, no. 11, 2006.
[28] D. Galorath, "Risk Management Success Factors,‖ PM World Today, vol 8 (11)," ed, 2006.
[29] D. Avison and G. Torkzadeh, *Information systems project management*. Sage, 2009.
[30] H. Huang and E. M. Trauth, "Cultural influences and globally distributed information systems development: experiences from Chinese IT professionals," in *Proceedings of the 2007 ACM SIGMIS CPR conference on Computer personnel research: The global information technology workforce*, 2007, pp. 36-45: ACM.
[31] Sarker, S., Hossain, B., & Sarker, R. (2018). Straddling the Boundary: The Case of Mahali Christians in .
[32] U. Remus and M. Wiener, "Critical success factors for managing offshore software development projects," *Journal of Global Information Technology Management*, vol. 12, no. 1, pp. 6-29, 2009.
[33] M. S. Raisinghani, B. Starr, B. Hickerson, M. Morrison, and M. Howard, "Information technology/systems offshore outsourcing: key risks and success factors," *Journal of Information Technology Research (JITR)*, vol. 1, no. 1, pp. 72-92, 2008.
[34] C. Summerill, S. J. Pollard, and J. A. Smith, "The role of organizational culture and leadership in water safety plan implementation for improved risk management," *Science of the total environment*, vol. 408, no. 20, pp. 4319-4327, 2010.
[35] Rosli, A., & Siong, T. I. (2018). Determinants of Customers Satisfaction Towards Services Provided by Agencies in Urban Transformation Centre (UTC). International Journal of Economics, Business and Management Studies, 5(1), 9-15.
[36] R. L. Kimbrough and P. J. Componation, "The relationship between organizational culture and enterprise risk management," *Engineering Management Journal*, vol. 21, no. 2, pp. 18-26, 2009.
[37] R. Dembo and A. Freeman, *Seeing Tomorrow: Weighing Financial Risk in Everyday Life*. M&S, 1998.
[38] S. M. M. Shah, R. Ali, A. S. Dahri, N. Ahmed, and Z. A. M. Brohi, "Determinants of Job Satisfaction among Nurses: Evidence from South Asian Perspective," *Journal of Academic Research in Business and Social Sciences*, vol. 8, no. 5, pp. 19-26, 2018.
[39] L. Mahilum-Tapay *et al.*, "New point of care Chlamydia Rapid Test—bridging the gap between diagnosis and treatment: performance evaluation study," *Bmj*, vol. 335, no. 7631, pp. 1190-1194, 2007.
[40] P. Ordóñez de Pablos, "Transnational corporations and strategic challenges: An analysis of knowledge flows and competitive advantage," *The Learning Organization*, vol. 13, no. 6, pp. 544-559, 2006.
[41] J. L. Pierce and A. L. Delbecq, "Organization structure, individual attitudes and innovation," *Academy of management review*, vol. 2, no. 1, pp. 27-37, 1977.
[42] L. A. Gordon and V. K. Narayanan, "Management accounting systems, perceived environmental uncertainty and organization structure: an empirical investigation," *Accounting, organizations and society*, vol. 9, no. 1, pp. 33-47, 1984.
[43] J. Birkinshaw, R. Nobel, and J. Ridderstråle, "Knowledge as a contingency variable: do the characteristics of knowledge predict organization structure?," *Organization science*, vol. 13, no. 3, pp. 274-289, 2002.

[44] N. Silver, "Critical success factors in complex projects.," 2010.
[45] J. DeLoach, "The new risk imperative–an enterprise-wide approach," *Handbook of business strategy*, vol. 5, no. 1, pp. 29-34, 2004.
[46] J. F. Hair, W. C. Black, B. J. Babin, R. E. Anderson, and R. L. Tatham, "Multivariate data analysis (Vol. 6)," ed: Upper Saddle River, NJ: Pearson Prentice Hall, 2006.
[47] J. Hair, C. L. Hollingsworth, A. B. Randolph, and A. Y. L. Chong, "An updated and expanded assessment of PLS-SEM in information systems research," *Industrial Management & Data Systems*, vol. 117, no. 3, pp. 442-458, 2017.
[48] W. W. Chin, "The partial least squares approach to structural equation modeling," *Modern methods for business research*, vol. 295, no. 2, pp. 295-336, 1998.
[49] Ahmed, U., Zin, M. L. M., & Majid, A. H. A. (2016). Impact of Intention and Technology Awareness on Transport Industry's E-service: Evidence from an Emerging Economy. *산경연구논집 (IJIDB)*, *7*(3), 13-18.
[50] Ali, A., & Haseeb, M. (2019). Radio frequency identification (RFID) technology as a strategic tool towards higher performance of supply chain operations in textile and apparel industry of Malaysia. Uncertain Supply Chain Management, 7(2), 215-226.
[51] Suryanto, T., Haseeb, M., & Hartani, N. H. (2018). The Correlates of Developing Green Supply Chain Management Practices: Firms Level Analysis in Malaysia. International Journal of Supply Chain Management, 7(5), 316.
[52] Haseeb, M., Abidin, I. S. Z., Hye, Q. M. A., & Hartani, N. H. (2018). The Impact of Renewable Energy on Economic Well- Being of Malaysia: Fresh Evidence from Auto Regressive Distributed Lag Bound Testing Approach. International Journal of Energy Economics and Policy, 9(1), 269-275.
[53] Haseeb., H. Z., G. Hartani., N.H., Pahi., M.H. Nadeem., H. . (2019). Environmental Analysis of the Effect of Population Growth Rate on Supply Chain Performance and Economic Growth of Indonesia. Ekoloji, 28(107).
[54] Manavizadeh, N., Malek, S., Vosoughi-Kia, R., & Farrokhi-Asl, H. (2017). An efficient risk based multi objective project selection approach considering environmental issues. *Uncertain Supply Chain Management*, *5*(2), 143-158.
[55] Manab, N., & Aziz, N. (2019). Integrating knowledge management in sustainability risk management practices for company survival. *Management Science Letters*, *9*(4), 585-594.
[56] Esfahani, H., Tavasoli, K & Jabbarzadeh, A. (2019). Big data and social media: A scientometrics analysis.International Journal of Data and Network Science, 3(3), 145-164.
[57] Salimi, D., Tavasoli, K., Gilani, E., Jouyandeh, M & Sadjadi, S. (2019). The impact of social media on marketing using bibliometrics analysis.International Journal of Data and Network Science, 3(3), 165-184.