

Role of Relational Capabilities on the Supply Chain Performance of Indonesian Textile Sector with Moderating Effect of Technology Adoption

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Abstract— In modern era dynamic business environment has been changed. In these days competition is no longer between organizations, but between supply chains. The supply chain dependency leads the business focused on supply chain performance. The objective of this study is to examine the influence of relational capabilities on the supply chain performance of Indonesian. This study also intended to investigate the moderating role of technology adoption on the relationship between relational capabilities on the supply chain Performance. To fulfil the objectives of this study, the data was collected from the managing directors, supply chain managers, planning managers, and procurement managers. Structure Equation Modelling was applied for the assessment of hypotheses. This study's findings show that supplier partnership, customer relationship and information sharing significantly influence the supply chain performance of Indonesian textile companies. Results also indicated that technology adoption has moderating effect on the relationship between supplier partnership, and information sharing with supply chain performance of Indonesian textile companies. Additionally, results indicate that technology adoption has no moderating role on the relationship of customer relationship with supply chain performance. This study contributes to Supply chain Management literature and provides empirical evidence that relational capabilities are those factors that could enhance supply chain performance of the firms with technology adoption.

Key Words: Supplier Partnership, Customer Relationship, Information Sharing, Supply Chain Performance

1. Introduction

Supply chain management (SCM) concepts gained attention in the 1960s however; first research was conducted in this field in 1982. Afterwards, the concept gained rapid and dramatic attention of researchers in 1990s [1]. Theoretical and as well as practical perspective, the concept gained prominent popularity in 2000s [2]. Importance of SCM regarding performance of firms has been discussed by the researchers in the literature since last three decades [3]. In the contemporary complex business environment, supply chain performance (SCP) of firms is supposed to focus on instead of performance of organization [4]. Numerous studies supported the proposition that firm should have their focus more keenly on SCP because it is directly associated with the performance of organization [5, 6].

Currently, research concerning SCM is becoming more important and interesting for organizations. The reason behind the interest is that the local business trends are transforming into global trends and firms have greater opportunity to expand their businesses across the world that enhances the complexity of SCM [7]. In SCM, a chain of participants collectively makes a channel that provide base for the competitiveness [8]. In current decade, the competition is more about the supply chain performance instead of competition between firms [6]. Therefore, nowadays, SCM has become a popular management technique in helping firms to improve competitiveness. The concept of SCM has been recognized to be of vital importance for textile industry [8]. The management can utilize the

functions of SCM for planning, organizing, and controlling logistics knowledge stream, capital movement, and information passing of the business.

It enables firms to improved response speed and reduces uncertainty of the supply chain [9].

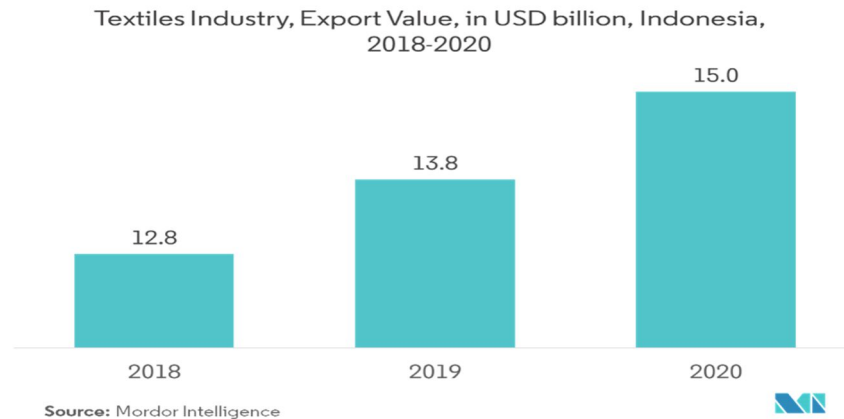


Figure 1: Overview of Indonesian Textile Industry

Textile industry plays a significant role in the Indonesian economy. According to the global business Indonesia guide (GBIG), this industry is one of the main contributors to the manufacturing sector in Indonesia. The Department of Statistic Indonesia reported that in 2017, domestic clothing and textile sector of Indonesia gained prominent growth. This sector witnessed an increase of 6 % from 11.8 billion USD to 12.4 billion USD by 2016 and 2017 comparatively. The trade balance of the sector was 1.7% from 3.67 billion USD to 3.73 billion USD by 2016 and 2017 comparatively. Additionally, in comparison to the previous year, investment was increased by 68% in the sector and remarkably share of local investors was 61.4%. The increased trend remains continued till the first six months of 2018 owing to the national demand and increasing exports. In the next half of the year, the value of exported textile products was 7.74 billion USD that is anticipated to 13-14 billion USD at the completion of the year. On the other hand, national sales of Indonesia were increased with the same speed.

In last few decades, technological development enabled textile industry to implement new procedures and methods to increase the performance [10]. Textile firms ensure ordinal goals such as diminishing delivery charges, storing cost, enhance reliability, improve quality, better flexibility, and rapid respond to ensure profitability and customer satisfaction [9; 74]. Otherwise, the sector will lose completeness in the rapid changing and unpredictable

business environment. Zara, the Spanish garments organization provides a relevant example of the complex supply chain. Zara is a one of the most dynamic and developed garments organization that produces seasonal clothes for costumers ranging from the age of 18 to 35 years. So, a major difficulty in the supply chains is the estimation of genuine demand [11].

Further, Fashion is all about technology management that utilized technology as an important element to attract customer and gain mutual benefits [12]. The adoption and application of the latest technology is required to develop the full potential of textile industry. Likewise, supply chain technology (SCT) is important in contributing to the growth of the economy and their linkage to the manufacturing industry. From aforementioned factors, we can conclude that in the short term textile industry has a limited impact in the economy. However, in long term competitiveness, it positively contributes towards the development for the country.

However, based on the Maslow's hierarchy of needs, garments and textile are one of the important elements of physiological requirements for human survival. Hence, textile is one of the most basic requirements and it provides necessary protection for people. Moreover, the textile has an exclusive position of an independent industry that starts from the supply of the raw materials and concludes with the delivery of finished products to end customer with considerable value added at each processes [3].

With the indirect evidence, the researchers were suggested to look for complete chain while studying textile context. Thus, this industry has potential to be researched, since it has a strong position in the Maslow's hierarchy of needs and limited studies have been conducted till now. In the boundary less business environment, businesses are faced an increasing customers pressure in product customization, quality enhancement, and demand responsiveness more than ever before [4]. In the past, businesses looked only internal factors of improvement and reduced their leftovers. Nowadays, businesses consider external factors of the firm to get ways to become more efficient. Therefore, continuous improvements on internal and external operations are necessary for continuous growth. Socio Economic and Environment Research Institute (2007) noted that the low labour costs were crucial for textile and apparel organization, but the other factors are likewise significant such as availability of human capital, employee skills and productivity, infrastructure capability, dependability of suppliers, costs and capital, business environment, and proximity to markets.

The smooth and accurate upwards and downwards information flows in the textile and apparel industry are essential to enhance the overall supply chain performance [13]. Besides, information sharing with trading partners is equally significant [14, 15]. In twenty-first century, supply chain technology is necessary to support information sharing [7]. [7] argued that supply chain is not merely a one way process. That is why, focus on upwards and downwards information flows and material is important. Similarly, [16] recommended that the data should acquire from different fields to achieve more competitiveness. Furthermore, one of the ways to achieve an agile response to market uncertainty was depended on the supplier partnership to provide quality material and flexibility in supply [11].

[17] pointed out that commercial success or failures in apparel markets are largely determined by the organizational culture capability such as flexible and responsive to rapid change in demand. The study of [18] revealed that organizational structures and estimates were insufficient to resolve the issue of demand uncertainty. Instead, an agile organization and agile supply chain are required to drive the supply chain. This is because contemporary textile

industry is greatly competitive and has been characteristics as short life cycles, tremendous product variety, greater instability, low certainty, high impulse purchasing, non-clear market limitations, diverse direction and enormous quantity of finished products [15, 17, 18]. Therefore, textile supply chain must focus on three importance lead times that are time to market, time to response and time to serve to gain more competitiveness [17].

Textile supply chain are facing typical problems which include forecasting errors for fashion items, short product life cycle for seasonal products, long manufacture time [8] and high production cost [19]. Hence, supply chain relational capabilities have been claimed to be potent resources to enhance supply chain performance, which has been well known in many different countries and industries [15, 20]. Although the link is indisputable, but supply chain relational capabilities were not beyond criticism and its effect on performance remain debatable. Based on the literatures, the impact of supply chain relational capabilities on supply chain performance is not consistent for every firm. However, it may effective in one firm and nominal in another [20, 21]. Therefore, there are two main issues relating to the improvement of supply chain performance.

First, for the improvement of the supply chain outcomes, supply chain abilities regarding relational capability would play a major role [21-24]. Textile industry has quick changing market due to the fashion trends. In supply chain, relational capability is referred to the ability to concerning the way in which two or more people or organizations or things are connected [25]. The prior study conducted by [24] stated that important factors for the supply chain performance are supplier participation, customer linkage, and information distribution. Besides, the empirical evidence stated by the researchers supported that the combination of technology adoption improve supply chain performance [26].

Second, the improvement of supply chain operational performance also significantly related to the technology adoption [27]. For the development of efficient supply chain, adoption of technology is a vital element. The association of SCM and technology adoption is not unanimous that is why the matter has potential of research. Limited research is available that measures the moderating role of technology adoption on the performance of supply

chain. Hence, potential of research in the area is extendable particularly regarding textile sector in the developing countries [28]. Technology adoption can be stated in the words that “the use and the usefulness of interconnected electronic applications to generate effective and efficient supply chain operation”. In

2. Literature Review

2.1. Supply Chain Performance

In recent years, the interest of researchers about performance of the supply chain has increasingly been more competitive than ever before while previous studies just emphasized on cost minimizations or profit improvements [30]. In the new supply chain plans, there are five stages to achieve supply chain excellent and its actual value, which include appoint the right people, adoption of advanced technology, outside cooperation, internal teamwork, and adopting innovation in the supply chain [31]. Currently, the rivalry in the market associated with the supply chain of companies rather than between individual companies. Therefore, effective SCM has become a strong strategy to secure competitive edges in market competitions [32]. Subsequently, improving supply chain performance becomes a critical focus for every entity in the market competitions [33]. The study of [2] indicated that the levels of SCM application have positive and significant association with competitive advantages. Therefore, many firms currently use SCM as their competitive weapons to improving performance [34]. Generally, firm performance and supply chain performance are not the same things. Supply chain performance is the intra-organizational and inter-organizational actual output or results, while organizational performance is the intra-organization or individual organizational actual output or results [35]. In nature of resource based view (RBV), environmental, operational, and financial performance are the categories of performance [36]. However, the contemporary study has focus on the operational performance because it has majorly significant impact on the performance. Operational performance in supply chain will have positive influence on environmental as well as financial performance [37]. Accordingly, environmental and financial performance would not be considered in the course of this study. Operational activities of supply chain are commonly involved the process from

textile sector, the technology adoption is a significant determinant of supply chain performance [28, 29]. Therefore, technology adoption in supply chain is expected to moderate the association of supply chain performance and relational capabilities.

transforming raw material or transitional products into finished products [38].

Usually, performance indicators for supply chain are consistency, cost, responsiveness, flexibility, and asset administration [33]. Basically, ultimate purpose of supply chain is the efficient distribution of goods and services to ultimate customers in minimum time and cost with maximum quality. Moreover, SCM has the aim of increasing financial as well as operational performance of every participant in the international supply chain [39].

2.2. Relational Capability

The focus in SCM is on the efficient, effective, and timely delivery of goods transforming raw materials and supplies through manufacturing to the ultimate customer or user. For this, upwards and downwards flow of information is needed in supply chain [40]. The management of customer relationship and supplier partnerships involves all that activities associated with the movement of goods and services from suppliers to final customers [39]. Essentially, partnership is the core of the connection between contractors and consumers. Thus, in relation to success in long term partnership, the mutual respect, a willingness to share information [41], share quality's information [42], fairness, and trust are required [43]. In this point of view, Supplier Corporation, customer affiliation, knowledge sharing, and information superiority is essential dimensions in determining relational capability.

2.3. Supplier Partnership

Technology advancement has become a driver for the organization to form a partnership with suppliers [44]. Partnership with suppliers able to strengthen the trust oriented relationships that results in the long term relationship which will provide interconnected communication network, high interaction and supportive business settings [45]. Moreover, suppliers partnership enables organizations to be cooperative with potential suppliers who are keen to

share accountability in achievement [32]. Suppliers who establish collaborative relationships with their customers tend to be technologically sophisticated. Otherwise, normal market mechanisms have to become intermediate for the relationship between suppliers and customers [46]. Therefore, the organizations that possess strong technological skills tend to be more potential to success in building partnerships.

In worldwide supply chain, supplier involvement is crucial to achieve higher supply chain performance [47]. In textile and apparel industry, suppliers can be categorized as few types that include agriculturalists, chemical producers, colour houses, ginning services, textile units, finishing mills, stitching workshops, transportation companies and distribution agents [48]. Building a good partnership with the suppliers of textile and apparel enables the organization to receive more quality materials, optimal inventory levels, and timely delivery [23]. Hence, only good management of the supplier's linkage can result in in the developed supply chain [48]. Based on the above literature this study hypothesized:

H1. Supplier Partnership has a significant positive influence on Supply Chain Performance.

2.4. Customer Relationship

The complementary resources that positively associate with the development of long term customer relationships are included technology resources, business resources, and human resources. These resources have a positive interactive effect on customer connectivity. In business and technology disciplines, CRM system is an application that helps firms to obtain and retain gainful customers [49]. The challenges are to communicate with customer by using the right way and at the right time and to discuss the right topic. Therefore, establishing a long lasting affiliation with customers not only enables firms to keep familiar with the customer requirements, but also one of the strategies to remain competitive in an increasingly dynamic market. The study of [29] pointed out that the person who can build and sustain relationships with final customer will achieve the competitive advantage of the supply chain. Thus, the collaboration among supply chains members would enhance firm's ability to achieve desired goals [6]. For instance, the purpose of Intel asked commitment from computer manufacturers to

place Intel sticker on their computers is to grasp the manufacturer's ability to change chip suppliers. Meanwhile, Intel is building a relationship with the end user through the sticker.

By information shared with customer, firms developed real time response receiving mechanisms from customer who provides actual demand forecast. Resultantly, firms efficiently manage inventory planning and delivery [45]. [50] had noted that the precise and real time information flow in the supply chain is essentially imperative to build customer's confident level toward firm [4]. It ensures supply chain partners to fulfil demand within shorter order times. Therefore, close relationship with customers enables the organizations to distinguish their product from opponents, gain customer's recognition, and enhance customer's satisfaction [32]. Nowadays, the marketing model is shifted from the product oriented to the customer oriented. In such situation, it is clear that the power of customer is strong and should put on priority. The good relationship with customer tends to improve the success levels of the firm [51]. Customers are increasingly demanding a different relationship with providers than ever before. Therefore, the creation of the database technologies enabled firms to identify the identity and purchase behaviour of customers through historical information. By having the database technology, firms able to make demands forecast more precisely. Based on the literature this study hypothesized:

H2. Customer Relationship has a significant positive influence on Supply Chain Performance.

2.5. Information Sharing

Information distribution is one of the significant success elements for SCM. It is an involvement to view partner's property data through network connected systems and monitor the progress of supply chain processes [52]. There are many types of private data such as data capturing, processing status, customer data, inventory data, order status, costing data, and performance status. Definition of Information sharing can be stated as the way of communication between organizations or supply chain members [53]. Therefore, it can reflect cooperation between supply chain members. However, the willingness to share information requires higher level of trust and extent of consistency [54].

By the supply chain point of view, the information can be shared within organization or between the organizations [45]. Intra-organizational information sharing taken place at two levels includes data level and business processes level [55]. While, inter-organizational information sharing can be divided into four levels which are order information exchange, operation information share, strategic information share, and competition information share [56]. The gathered and shared real time information is crucial to improved supply chain performance [45, 54, 57]. Particularly, information shared results in greatest inventory cost savings, by providing accurate demand forecast, real time information, increasing communication [45], reduce total cost, enhance services level, reduce demand uncertainty, higher order completion rate, reduced order time [53], inventory reduction, expected cost reduction [58], reduce logistic and shortage costs, on time delivery [54], and achieve customer satisfaction [54] in the supply chain. However, the result is definitely depended on what, when, who, and how the information is shared.

In addition, the information share also can be categorized to two categories, which is vertical and horizontal information. Vertical information is shared through upstream firms such as manufacturers, and downstream firms such as retailers, while horizontal information is referred to the information shared within the organization [59]. Vertical information sharing can have two effects, which are direct and indirect or leakage effect. Direct effect referred to the alteration of strategy by the participants included in the information sharing, while indirect or leakage outcome referred to the deviations of strategies by competitor firms [60]. Li [60] argued that the leakage effect disallows the retailers to shared demand with the producer, while encourages manufacturers to report cost related information to retailers. Naturally, the information can be shared by two aspects in terms of quantity or quality. The quantity and the excellence of the information provided are essential for the practices of SCM [32]. Large volumes of precise information sharing can be a source of competitiveness within in the supply chain process [32]. Effective SCM required consistent exchanged and shared of precise information in order to maintain lasting relationships and partnerships with members in the supply chain [61]. Information

sharing is a key enable for textile and apparel SCM to improve performance. The lack of information sharing from the supplier's perspective led suboptimal supply chain performance. While, the lack of information availability was one of the critical failure factors pertaining to SCM [62]. Therefore it is hypothesized:

H3. Information Sharing has a significant positive influence on Supply Chain Performance.

2.6. Moderating role of Technology Adoption

Technology is a challenge of traditional norms. In the present times, technologies significantly affect human, society, the global economy and ability of other species in controlling and adapting their natural environments. Technology is a term that can be applied generally or specifically such as construction technology, medical technology, IT, etc. Basically, most of the technology enables process simplification, standardization, automation, and hence improving communications, process efficiency, organizational productivity, and effectiveness. However, all kind of technologies are not supportive for peace process. For instance, the development of weapons can be a tool to provide safety for human, but also increasing destructive power of the world. Likewise, there is no difference for technology in the supply chain. With all other aspects of a firm, the role of technology is crucially important in managing the supply chains. It is not only generate automation and process proficiency, but also provides better qualitative results [63]. The global business competition has revealed the needs of information technology in securing business competitiveness. Nowadays, the word "IT" or "information technology" is frequently applied by most of the companies and even individual in the world. Therefore, the information technology is playing an important role at the moment and future as well. Information technology consists of wide range of technologies, including multimedia, telecommunications, computer hardware and software that involved in information handling and processing [64].

Basically, IT also encompasses information system (IS) and information and communication technology (ICT). IS are the study of hardware and software that usually people and organizations apply to gather, screen, process, create, monitor, control, and allocate

data [65]. The final contribution is to support management and operation teams to make the informed decisions [66]. Similarly, ICT is frequently used as a stretched synonym for IT, but it is more focused upon the function of communications and the integration of telecommunications by electronic equipment. The further discussions on ICT and IS are as follows. ICT has become indispensable as a factor which creates a competitive advantage for business [67]. There are a few indicators of ICT that can be referred to two widely used media of mass communication such as newspapers and televisions. Telecommunication facilities are associated with telephones and mobile telephone density [54]. Based on the study of [68], ICT usage could be generally classified into three ways, namely decision support to public administrators (i.e. geographical information

system), improving service for people, and authorizing people to have access of information and knowledge. Nevertheless, the administrators must be open minded and willing to change their working style by utilizing the ICT to accomplish higher performance. Hence, this study proposes the following hypothesis.

H4. Technology adoption has a moderating effect on the relationship of relational capabilities and Supply Chain Performance.

2.7 Research Framework:

This section of the study presents the proposed research framework for testing the relationship between relational capabilities and organizational supply chain performance with moderating effect of technology adoption.

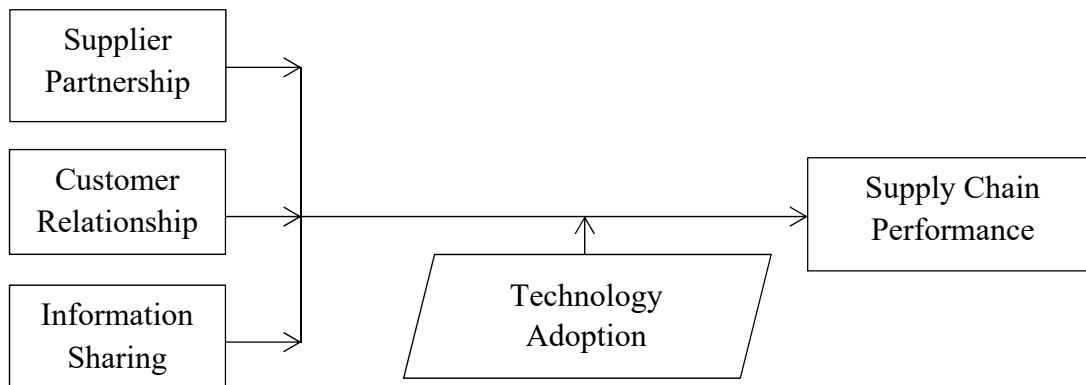


Figure 2: Proposed research framework

3. Methodology

Research methodology is comprised of plans and procedures that include approaches of data gathering and analysis for research which will shape the decision in the form of broad assumptions. In social sciences research, there are three major research paradigms which are quantitative, qualitative and mixed approach. This study was employed quantitative method. The intent of this research is to examine the relationship of supply chain relational capabilities and supply chain performance on Indonesian textile sector. Since this study employed a quantitative research design in conducting the research and the instruments applied were survey questionnaires. The survey data also known as numbered data was collected from Indonesian textile companies to test the theoretical framework by statistical procedures. The targeted survey subjects

were managing directors, supply chain managers, planning managers, and procurement managers (some organizations called them as a buyer, purchasing, order fulfilment, order management or customer service manager whose most responsible for SCM or direct deal with a customer, supplier, and inventory control) to represent their organization to provide information in order to maximize the validity for this research content. Therefore, middle level employees in Indonesian textile companies were considered appropriate to participate in this study.

3.1. Analysis and Discussion:

In this study, the PLS-SEM approach was adopted, which involves two steps approach i.e estimation of the measurement model (i.e. outer model) and assessment of the structural model (i.e. inner model) [69]. In estimating the measurement models, each constructs is tested separately in the beginning to

establish the validity and unidimensionality [70, 71]. In assessment of the structural modeling for the inner model relationship can proceed once the assessments of the measurement models completed.

3.2 Measurement Model:

“Measurement model” was estimated to examine the reliability and validity of Variables. Reliability was

examine through “Cronbach’s Alpha” and “composite reliability”(CR) [72]. While, validity of variables assessed through Convergent Validity. Table 1 is presented the values of “Cronbach’s Alpha” and CR.

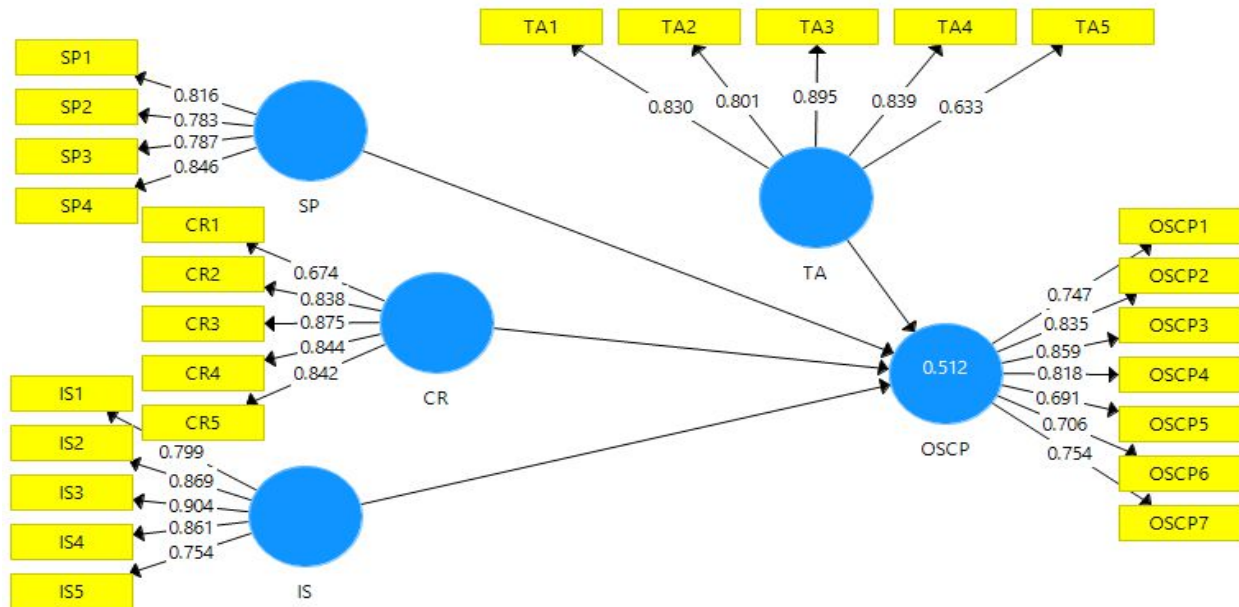


Figure 3: Measurement Model output

Table 1. Cronbach's alpha and CR:

Sr#	Constructs	Cronbach's alpha	CR	Remarks
1	Supply Chain Performance	0.821	0.711	Acceptable
2	Supplier Partnership	0.786	0.856	Acceptable
3	Customer Relationship	0.756	0.719	Acceptable
4	Information Sharing	0.839	0.796	Acceptable
5	Technology Adoption	0.831	0.742	Acceptable

The value of discriminant presented in Table 2

Table 2. Discriminant Validity

Sr#	Constructs	1	2	3	4	5
1	Supply Chain Performance	0.595				
2	Supplier Partnership	0.478	0.511			
3	Customer Relationship	0.350	0.111	0.387		
4	Information Sharing	0.231	0.232	0.169	0.288	
5	Technology Adoption	0.195	0.326	0.259	0.111	0.128

3.3. Structure Equation Modelling

PLS-SEM was used to investigate the proposed relationship between relational capabilities and organizational supply chain performance and for testing moderating effect of technology adoption on the relationship of relational capabilities and Supply Chain Performance.

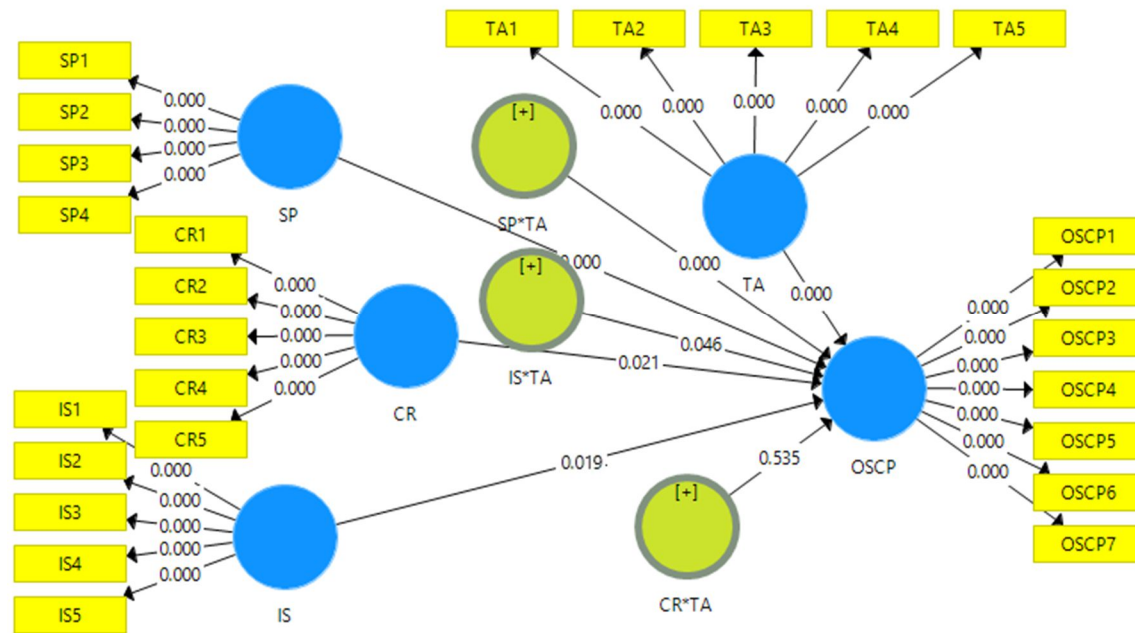


Figure 4: Structure Equation Modelling output

Table 3. Direct Relationship

Hypothesis	Relationship	Std. Beta	S.E.	t-Value	P-Value	Decision
H ₁	SP -> SCP	0.156	0.042	3.714	0.000	Supported
H ₂	CR -> SCP	0.211	0.086	2.453	0.021	Supported
H ₃	IS -> SCP	0.194	0.052	3.730	0.019	Supported

Findings of this study show that H1, H2 and H3 were accepted. This study used t-value 1.96 to assess the association between the variables. Results found that suppliers' partnership has significant positive relationship with supply chain performance with t-

value 3.714. Moreover, findings illuminated that customer relationship and information sharing also had a positive influence on supply chain performance with t-value, 2.453 and 3.730 respectively. These results are in line with the results of [73].

Table 4. Moderating Relationship

Hypothesis	Relationship	Std. Beta	S.E.	t-Value	P-Value	Decision
H _{4a}	SP*TA -> SCP	0.132	0.059	2.237	0.000	Supported
H _{4b}	CR*TA -> SCP	0.106	0.103	1.029	0.535	Not Supported
H _{4c}	IS*TA -> SCP	0.241	0.105	2.295	0.046	Supported

Findings demonstrate technology adoption significantly moderate the relationship of Supplier partnership with organizational supply chain

performance with t-value 2.237 that is above the threshold t-value 1.96. Moreover, technology adoption has no moderation effect on the relationship

of customer relationship with Supply Chain Performance. Finally, results indicated that technology adoption has significant moderation role on the association of information sharing with Supply

3.4. Conclusion:

Object of the study was to investigate the influence of Relational Capabilities on Supply Chain Performance of Indonesia textile companies. This study also intended to examine the moderating effect of technology adopting on the relationship of Relational Capabilities on Supply Chain Performance of Indonesia textile companies. For this purpose, researchers used survey method and data was collected from managing directors, supply chain managers, planning managers, and procurement managers via questioner. Data analysed by using PLS-SEM approach. Results of this study provide comprehensive and very significant findings. According to the findings of current study, relational capabilities are very significant for the performance of textile companies. Implementation of relational capabilities could improve the Supply Chain Performance. These results are also consistent with the results of [73]. Moreover, the findings indicated

Chain Performance. These findings shows that H_{4a} and H_{4c} were accepted while, H_{4b} rejected on statistical grounds.

that technology adoption is very important for Indonesian textile companies. Technology adoption could enhance the effect of suppliers' partnership with Supply Chain Performance. Additionally, technology adoption can improve the information sharing system that positively affects Supply Chain Performance.

This study contributes in the literature of Supply chain management offer many theoretical and practical implications for practitioners. The findings of this study revealed the importance of Relational Capability in management practices. Moreover, the results of this study revealed technology adoption is very significant for Relational Capabilities and Supply Chain Performance. The findings of this study provide evidence that most of the organization focus on supply chain capabilities however, technology adoption is also equally important for the performance of organizations.

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