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Role of Information Sharing and Green Supply Chain management on Supply Chain Performance: Empirical Evidences

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ABSTRACT: In Chinese textile and apparel industry performance of the supply chain managers are found limited in literature and requires more confirmation. The aim of this study is to empirically investigate the impact of Green supply chain management practices, and supply chain capabilities on supply chain performance. For so doing, data were collected through a structured questionnaire form supply chain manager working in textile industry of China. Partial least square structural equation modeling technique was used to test the hypothesized relationships. With the help of SPSS and SmartPLS data has been analyzed and it is found that supply chain capabilities were having highly positive impact on the performance of supply chain Managers among apparel and textile industry of china. Study is limited to Guangzhou, China. The importance of relational capacity, information technology capacity, and capability of organizational culture seeing that important capability of supply chain is exposed. The importance of adoption of supply chain technology as a significant reciprocated interactions tool is revealed the importance of adoption of supply chain technology as a significant mediating variable on the relationship between capability of supply chain and operational performance of supply chain is revealed additionally. Research report ended with possible future direction for new researcher in organization part of supply chain.

Keyword: Information Sharing, Supply chain Management, supply chain performance, Green supply chain Management. Reliability, Responsiveness.

I. INTRODUCTION

During global economic slowdown textile and apparel industries did not face significant impact, which witnessed the growth in economy [1]. In china though consumers were very cautious in their spending yet textile and apparel industries remained highly competitive with rising domestic demand and purchasing power toward the branded apparel such as Zara, H&M, Gap, Uniqlo, Levi's, Adidas, Mango, G2000, Vincci, and P dini. Its expert retailers also remained the biggest sharing channel for clothing and remained highly competitive. For this reason number of shopping centers being built is increasing. Instead of other channels the buy would like to buy from the official store of that brand. What kinds of supply chain capabilities are important to be competitive and its effects on adoption and action of supply chain technology remained much disputable nationwide. Individual performance is different from operation performance as Individual performance yields organizational performance when collectively and holistically viewed [2-4]. The operational performance and the adoption of supply chain technology in textile and apparel industries needs enhancement as indicated by these arguments. Therefore the contribution factors of operational performance of supply chain and the adoption of supply chain technology in textile and apparel industries will be investigated by the current study.

The forecasting errors for fashion items, short duration for the production cycle of fashion articles, large manufacture lead time [5] and high production cost [6] these are the characteristic problems faced by the textile and apparel supply chain. Hence considered capability and adoption of supply chain technology has been claimed to be potent resources to enhance performance of supply chain [7], which are very famous and has been well known in different countries and industries. The supply chain capabilities and adoption of supply chain technology were not beyond reproach and its effect on performance remains debatable though the link is indisputable. For every firm the effect of supply chain capability on its operational performance is no consistent, it may effective in one firm and nominal in another [7] on the bases of the literature review. Two main issues relating to the progress of operational performance of supply chain can be recognized.

Firstly, supply chain capabilities in terms of relational capability, Information technology capability, and capability of organizational culture would play a major role [8] for the development of the operational performance of supply chain. Organizational structure, work characteristics are significant when overall human resources development is the concern [9, 10]. Due to the fashion trends textile and apparel are quick change markets. According to famous researcher [11], in supply chain, relation capability is referred to the ability to concerning the way in which two or more people or organizations or things are connected. Sukati *et al.,* (2012) stated that the determinant of performance of supply chain are partnership with supplier, relation with the customers and information distribution, whereas

information quality leads to enhanced competitive advantage was claimed by researchers [12].

Previous research regarding Chinese textile and apparel industry has not been found as comprehensive as it should be specifically in terms of Information technology and communication point of view. The combination of IT communications [13] and IT re configurability [14] serve as firm's specific IT capability and thus improving performance of supply chain was supported by researchers as indicated by the empirical evidence. An effective organization should possess high level of organizational culture capability, which consists of involvement, consistency, adaptability, and innovativeness as highlighted by the previous study [15]. Therefore improvement in the operational performance of supply chain is expected to be explained by supply chain capabilities though the nature of the relationships between these elements has not been absolutely understood.

Secondly, the development of the operational performance of supply chain found [16] closely linked to the adoption of supply chain technology. Technology adoption is the major concern with the developing efficient of supply chain. In SCM the role of adoption of supply chain technology thus remains controversial because has not been fully agreed. In relation to the mediating role of adoption of supply chain technology on supply chain operation performance there is a relatively insufficient study. In the developing country [17], it extend the area of research, specially for the textile and apparel industries

Adoption of supply chain technology is defining as, the used and value of interconnected electronic applications to generate effective and well-organized supply chain operation. According to famous researchers [17] in textile and apparel industry, the adoption of supply chain technology is an important determinant of supply chain performance. Therefore, between supply chain capabilities and operational performance of supply chain adoption of supply chain technology is expected to mediate the relationship. There is limited studies have investigated the mediation effect of adoption of supply chain technology as to the best knowledge of the researcher.

SCOR model is employed by thousands of companies worldwide which including manufacturers, distributors, retailers, and service provider was claimed by Supply Chain Council [18]. SCOR model in measuring the performance of the supply chain has been applied in limited academic study. The elements in SCOR model, which consists of dependability, responsiveness, agility, cost, and asset management efficiency, are suitable to use the measurement of performance of supply chain that involves the complete Supply chain members. SCOR model could provide multi view in business operational environment [19].

Therefore asset management efficiency is excluded and operational performance of supply chain instead of financial performance is focus of the present study. The elements in SCOR model were effective in measuring the performance of supply chain [20] as were shown by the empirical studies. Hence, it is expected to explain the effect of supply chain capability and adoption of supply chain technology to performance of supply chain through agility, cost, reliability and responsiveness.

It is also found [21] that there is still lack of theoretical support for understanding and explaining the reality or the boundaries of SCM. To summarize, through capabilities and adoption of supply chain technology the expected poor performance of supply chain in textile and apparel industries is could be improved. Researchers said that research that investigates the link among supply chain capabilities, adoption of supply chain technology, and performance of supply chain in textile and apparel industry is still in its early development.

The present study suggests adoption of supply chain technology as the moderating effect, which is expected to influence textile and apparel supply chain operational performance, owing to strong competition, high complexity, and uncertainty in the textile and apparel market environment. Therefore to examine the link between supply chain capabilities, supply chain technology adoption and performance of supply chain in textile and apparel industries this study is an attempt. The capabilities of supply chain related to supply chain technology adoption and operational performance of supply chain would be identified consequently in order to reach enhancement in textile and apparel supply chain operational performance.

II. LITERATURE REVIEW

The operational performance of the supply chain is defined as the result of a organized, planned and effective harmonization of regular business functions and through the association that engage action and procedure related to the conversion of raw material inputs into final products [22].

For the purposes of this study, reliability, responsiveness, agility, and cost of supply chain are considered when evaluating the chain's operational performance of supply. Supply chain to fully evaluate performance throughout the entire research process. Asset management is not included in the estimated list of the operational performance variables of the supply chain. This is because operational performance does not emphasize financial performance because capital management in the definition of the SCOR model is more a return on investment.

In this study, the reliability of the supply chain was defined as the quality of the supply chain that meets the requirements of the requirements established in the perfect fulfillment of compliance and maintenance orders. In addition, the rate at which member of supply chain receive products, services or information is known as responsiveness of supply chain. In addition, agility in the supply chain is defined as the ability to quickly adjust the strategy and operation of the supply chain based on market changes. In addition, supply chain costs are defined as the costs associated with supply chain operations. Supply Chain Capabilities: The ability to integrate all activities in supply chain associated with the flow of information and the conversion of goods from raw materials to end user [23] known as supply chain recourses. In this study, the resources of the chain of delegations refer to relational resources, IT resources and organizational culture. The study related to relational capabilities and organizational cultural capabilities are being done in other high tech industries of china but the hidden linkage found undervalued.

A. Relational Capability

Relational capability is defined as the ability to concerning the way in which two or more people or organizations or things are connected [11]. In the context of this research, relational capability is operational zed as a set of ability that includes supplier partnership, customer relationship, information distribution, and information quality. Long time relation among supplier and organization know as supplier partnership that providing goods or services to the business to achieve significant ongoing benefits. While, customer relationship is defined the relationship among the organization and customer, that acquire goods or services from the business to achieve significant ongoing benefits. Besides, the extent of serious and proprietary information of an organization is communicated to other people or organizations called information sharing. In addition, the degree of excellence of information fits the people or organization's needs known as information quality.

B. Green supply chain management

"Green supply chain management can be defined as integrating environmental thinking into supply-chain management, including product design, material sourcing and selection, manufacturing processes, delivery of the final product as well as end-of-life management of the product after its useful life".

C. Organizational Cultural Capability

Organizational culture capability is explain as the area of behavior or pattern of people works in an association to affect the way of people and groups interacts with each other as well as members in the supply chain [24]. In the context of this research, organizational culture capability is operational zed as the extent of behavior or pattern of people works in the organization that include involvement, consistency, adaptability, and innovativeness. Involvement is defined as the act of employees takes part or participates in something. While, consistency is defined as the ability of employees to remain the same behavior, attitude, or quality of work. Besides, adaptability is defined as the ability of employees to copes with unexpected disturbances in the environment. In addition, innovativeness is defined as the ability of employees to apply new approach or new ways of doing things to meet new requirements, inarticulate needs, or problem solving.

Hypotheses Development: The rising complexity of the global supply chain has forced manufacturers to focus more on supply chain performance [31]. Supply chain capabilities have been distinguished as the most important factors for improving performance. In any case, some associations have not understood the importance of supply chain skills and, thus, do not fully focus and use their capabilities. According to the findings of the written survey, the known limit, the IT limit and the hierarchical limit of culture are the main segments of the supply chain's capabilities to improve the supply chain.

In SCM, social ability is a typical business practice. One of the famous researchers [27] notes that data exchange is a typical way of dealing with the expansion of supply chain performance. This is reinforced by researchers [7, 25] noted that data trading is one of SCM's key facilitators based on materials and clothing to improve supply chain performance. Meanwhile, the investigation of other researchers discover that data trade and data quality are further influenced in improving the performance of the supply chain. Some authors discovered that trade in operational and key data mainly affected the performance of the supply chain, which in any case improved to half the performance.

The commitment of the Affiliation of suppliers [26] and the relationship with the client are also basic for the associations of materials and clothing for a Quick reaction to fast market trading. Numerous analysts presumed that the affiliated limit, for example, data trading, the nature of the data, the linkage of the supplier and the relationship with the customer has a great relationship with the performance of the supply chain [27]. It is completely good with the current commercial condition of materials and clothing. Depending on economic situations, a social capacity, for example, the trade of first-level data between garment manufacturers, material manufacturers, fiber suppliers and style retailers, is expected to provide a fast and responsive supply chain, Since the business is never more inclined [22] what is more, the capacity allows it. The interconnection of Li and Reserve, a Hong Kong-based commercial company, effectively addresses the worldwide supply chain and meets the needs of virtually any customer. In this way, it is accepted that a more notable social power becomes a more prominent operational performance of the supply chain.

In addition, existing writings composed a hypothesis and showed that authorized culture was considered an important factor in improving the performance of the supply chain [28]. The research which incorporates 218 reactions from the supply chain authorities registered in the Supply Establishment Executives (ISM) in New York, showed that authoritarian culture has an immediate positive association with the performance of the supply chain.

In general, the selection of mechanical advance is affected by three general elements, which are specific, innovative and natural ecological environments [29] Innovation is a key connection power that regularly connects with colleagues [30]. Successful and competent correspondence between the provider and the association is achieved by receiving adequate progress. Not only is there a social limit, but the company's IT capacity and society are also significant structure squares.

Numerous scientists have exhibited this connection between suppliers, customer relationship, data trade and data quality [30] are important factors that affect the reception of innovation in the supply chain In this way, [31] it was noted that the scope of data trading should be thoroughly examined before receiving innovation in the supply chain. Simultaneously, the choice of appropriation should be based on the types of data shared, given that the nature of the data is perceived by the requirements of the clients. In addition, an examination conducted on the driven selection of assembly advances in Ontario found that a welcoming partnership with a customer and excellent supplier affiliation are critical to effective reception. This implies that the selection of the supply chain innovation

is related to more significant network levels.
This paper estimated the hypothesis and indicated that hierarchical culture was considered a significant factor in the mechanical selection of the supply chain [32]. Some examinations have indicated that authorized culture has a lot to do with the selection of cutting-edge manufacturing systems, reception of shared innovation, the production of Cell tests and constant assembly tests [33].
In the current business pattern, computerized and calculation arrangements are one of the most important instruments that add to the significant advances in the materials and clothing industry. It has become autonomous and the benefits have been extended to cover all regions of the materials and clothing industry, including the coordinated structure, apparatus, manufacturing, generation control and dashboard, executive data, tests and quality assessments, promotion and retail instruments. Therefore, it is accepted that adopting the supply chain innovation offers numerous advantages to materials and clothing organizations.
Some researchers [34, 27, 19] found that interests in the limit of arrangements can drive better performance of the supply chain, however, the prosperity of an association depends on the type of innovation provided. It is also noted [35] that the reception of innovation in the supply chain is intended to improve the suitability and effectiveness of commercial exchanges, for example, fast data access, improved correspondence, improved customer service, work decreased administration and improved profitability and time domain. In addition, it is presumed that innovation in the supply chain allowed organizations to characterize material needs, improve customer reaction, react quickly to advertising changes, ideal offices and work use, and decrease stock maintenance costs .
Specifically, PC driven innovation is widely used in the American garment industry. To deliver pieces of clothing for mass customization, for example, make styles, organize and make names, you need a quick and accurate procedure from the item you want to assemble and promote [36]. It is also noted that the use of computer-aided design, the PC helped to manufacture (CAM), the tests supported by CIM and PC (Feline) greatly energizes and untangles the pragmatic tasks of materials and clothing. Therefore, it is recommended that receiving innovation in the supply chain improves the reliability of the supply chain, increases the reaction of the supply chain, increases the adaptability of the supply chain and decreases the costs for the base supply chain.
The idea of the pattern in design, materials and clothing causes the business to meet sudden needs in a short period of time. The appropriation of innovation could become a genuine commitment to SCM [37], if an association can understand the mechanical capabilities and complete the process flow. This can be confirmed observational through the investigation [37] with a significant effect in the middle of the road in the reception of the supply chain innovation. Further it was stressed that the reception of supply chain innovation is deeply affected by natural, mechanical and administrative qualities, and selection has also improved the performance of the organization's supply chain. As a summary of the above-mentioned disputes, the reception of the supply chain innovation is an intermediate person in the connection between the supply chain capabilities and the operational performance of the supply chain. These lead to the accompanying suppositions recorded.

Hypothesis:

H1: Supply chain capabilities are positively related to SCOP.
H2: Relational capability is positively related to supply chain operational performance.
H3. Organizational cultural capability is positively related to supply chain operational performance.
H4. Green Supply Chain Management positively effect to supply chain operational performance.

III. MATERIALS AND METHODS

In this article, postal and online surveys were the major data collection methods in this study. Therefore, firstly, there must have a cover letter to explain the importance and objective of the research in the context of SCM in Chinese textile and apparel industry. The letter head of the academic institution, the supervisor's real signature, certification of study from respective school. To test the hypothesis of this study, we used SmartPLS software to run PLS-SEM. PLS-SEM has become a widespread technique in management and marketing literature and has been utilized by several previous studies such as [38-42].

Data Collection Procedure: There are several activities were taken during the data collection period in order to encourage and raise the willingness of the respondents to take part in this research. The best procedure in data collection is essential to get a response. Thus, the response rate should be increased by following activities:

— Pre-survey e-mail and phone call notifications for participation are significance and imperative to respondents.
— A set of conventional survey packet which consists of cover letter, education certificate, approval latter, stamped reply envelops, and survey booklets were mailed to respondents. Cover letter clearly explains the purpose of the study as well as ensuring anonymity and emphasizing confidentiality by the permission letter. A stamped and enclosed self-address reply envelope were attached together for respondent's convenience to return the completed questionnaire.
— To improve the response rate, a survey package was sent through e-mail and the link of a web-based survey questionnaire was also provided to the respondents to make them more convenient to respond, since the Internet and mobile data services have been available everywhere recently.
Follow up is important to get a response. Thus, the consistent follow up with email and phone calls are strategies to increase the response rate. Besides, the second follows up mail with a replacement questionnaire were sent to those who have not responded to the survey to increase the response rate.

IV. DATA ANALYSIS

PLS-SEM was chosen as a perfect factual procedure for this exam, while CB-SEM was impossible. In view of the suggestion of [48], the sample size of 121 was adequate for the survey with PLS-SEM.

In any case, there is a comparability between CB-SEM [38] and PLS-SEM [47] in which both receive two advances methodology. The PLS-SEM road model begins with the evaluation of the estimation of the estimation model and is followed by the evaluation of the road relationships of the auxiliary model [47]. The evaluation of both the external model and the internal model of this research was examined in detail in the following areas.

Assessment of the Measurement Model/ Outer Model: Estimation of measurement model is referred to the assessment of statistical elements of the model. This is to ensure the measurement model is good enough and qualified for further statistical test. In order to proceed for further statistical test, the measurement model of this study has been studied through internal steadiness or dependability, construct validity, convergent validity, and classify validity by using SmartPLS. Following figure illustrate the linkage between manifest variable (MV) and latent variable (LV) of the study using SmartPLS as a center of the analysis.

Internal Consistency Reliability: Reliability can be seen as a prerequisite of validity. It has concerned with the extent to which measures are "free from errors and therefore yield consistent results" [43]. The reliability is stressed due to the defective impact in which unreliable measures weaken the correlation between measures. Therefore, multi-item scales measurement was recommended by Peter (1979) [43] to handle the issues of measurement errors. With the multi-item scales, researcher is allowed to delete the items with measurement errors to improve the reliability of the scale. However, this study was free from the concerned, since all the measurements were measured by at least five items.

Internal consistency is a method that used to test for dependability through homogeneity of a group of object ([43, 44]. This is to assess the degree to which the objects of one scale capture the same build. Composite reliability (CR) is frequently used to assess the internal consistency or the reliability of the constructs [44]. It is normally understanding in the same ways as Cronbach's alpha (CA).

Based on the finding of earlier researchers [45] recommendation, the reliability values from 0.70 to 0.90 regarded as acceptable. However, the value more than 0.90, especially more than 0.95 are not acceptable because there is a probability that most of the variable like indicators are calculated the same or similar phenomenon [46].

Convergent Validity: Convergent validity gives the information that "a set of indicators represents one and the same underlying construct, which can be demonstrated through their unidimensionality" [47]. The purpose of convergent validity is "to examine the ability of an item to correlate with other items under the same construct to measure the same concept". Further they advised advise to assess the average variance extracted as a principle with the values above than 0.50. However, one of the most prominent researchers [48] suggested assessing the feature loadings, composite reliability (CR), and AVE as a criterion with values of loadings greater than 0.70, CR more than 0.70, and AVE above than 0.50. An Average Variance Extracted (AVE) value of 0.5 can be taken as a fact that half of the variance of manifest variable is defined by latent variable on average [47].

The results existing in the table below illustrated that the loading of all items are above than 0.70 and the value of all construct of composite reliability is more than 0.70, while the AVE values of all constructs more than 0.50, ranging between 0.699 and 0.869. Based on the results presented, it is arithmetical satisfied the convergent validity criteria suggested by Hair *et al.*, in 2011 [48]. In addition to the presumption, it can be interpreted as all the constructs used are able to calculate the actual ideas of study.

Table 1.

2nd Order	1st order	Items	Loadings	AVE	CR	Cronbach's α
	Supply chain Performance			0.598	0.811	0.791
		SCP1	0.856			
		SCP2	0.722			
		SCP3	0.845			
		SCP4	0.783			
		SCP5	0.928			
		SCP6	0.913			
		SCP7	0.832			
		SCP8	0.899			
		SCP9	0.880			
		SCP10	0.945			
		SCP11	0.756			
		SCP12	0.722			
		SCP13	0.845			
		SCP14	0.883			
		SCP15	0.928			
		SCP16	0.913			
		SCP17	0.532			
		SCP18	0.899			
		SCP19	0.880			
		SCP20	0.945			

		SCP21	0.756			
		SCP22	0.722			
Supply chain Capabilities				0.661	0.885	0.811
	Relational Capability	RC1	0.800	0.591	0.889	0.799
		RC2	0.773			
		RC3	0.825			
		RC4	0.855			
		RC5	0.915			
		RC6	0.830			
		RC7	0.828			
		RC8	0.731			
		RC9	0.806			
		RC10	0.800			
		RC11	0.773			
		RC12	0.725			
		RC13	0.855			
		RC14	0.915			
		RC15	0.730			
		RC16	0.727			
		RC17	0.737			
		RC18	0.707			
		RC19	0.800			
		RC20	0.773			
		RC21	0.725			
	Cultural Capabilities			0.599	0.799	0.781
		CC1	0.839			
		CC2	0.844			
		CC3	0.893			
		CC4	0.833			
		CC5	0.912			
		CC6	0.841			
		CC7	0.844			
		CC8	0.830			
		CC9	0.788			
		CC10	0.866			
		CC11	0.812			
		CC12	0.882			
		CC13	0.839			
		CC14	0.844			
		CC15	0.893			
		CC16	0.833			
		CC17	0.712			
		CC18	0.841			
		CC19	0.844			
		CC20	0.830			
		CC21	0.788			
		CC22	0.866			
		CC23	0.712			
Green Supply Chain management				0.661	0.878	0.861
		GSCM1	0.874			
		GSCM2	0.928			
		GSCM3	0.870			
		GSCM4	0.878			
		GSCM5	0.833			
		GSCM6	0.772			
		GSCM7	0.859			
		GSCM8	0.745			
		GSCM9	0.732			
		GSCM10	0.874			
		GSCM11	0.928			
		GSCM12	0.870			
		GSCM13	0.878			
		GSCM14	0.833			
		GSCM15	0.772			
		GSCM1	0.859			

		6				
		GSCM17	0.745			
		GSCM18	0.732			
		GSCM19	0.874			
		GSCM20	0.928			
		GSCM21	0.870			
	Supply Chain Technology Adoption			0.612	0.871	0.869
		SCTA1	0.815			
		SCTA2	0.735			
		SCTA3	0.778			
		SCTA4	0.867			
		SCTA5	0.860			
		SCTA6	0.815			
		SCTA7	0.735			
		SCTA8	0.881			
		SCTA9	0.867			
		SCTA10	0.860			
		SCTA11	0.815			
		SCTA12	0.735			
		SCTA13	0.783			
		SCTA14	0.870			
		SCTA15	0.878			
		SCTA16	0.833			
		SCTA17	0.772			
		SCTA18	0.859			
		SCTA19	0.745			
		SCTA20	0.732			
		SCTA21	0.874			

Discriminant Validity: Discriminant validity is a sister measurement of convergent validity. It is used to check the dissimilarity in the measurement tools of different constructs. In PLS-SEM, there are two measures for discriminant validity. The assessment of discriminant validity was performed to ascertain the external consistency of the model. Fornell and Larcker in 1981 [55] noted that discriminant validity was confirmed when the square root of each construct higher than its highest correlation with any other construct.

Table 2: Discriminant Validity of Construct.

	Cultural capabilities	Relational capabilities	Supply Chain Performance	Supply chain practices
Cultural capabilities	0.773			
Relational capabilities	0.311	0.768		
Supply Chain Performance	0.139	0.242	0.773	
Supply chain management	-0.002	0.042	0.358	0.813

Note. Diagonals (bolded) symbolize the square root of the average variance extracted (AVE) and off-diagonals symbolize latent variable correlation.

At the beginning of measurement model assessment, the full model and the links of the relationship were discussed. This perhaps has to be revised and modified throughout the processes of measurement model assessment. This is so because the CFA prompted the deletion of some items. However, none of the variables were dropped because the entire variables retained at least five items as a condition not to be deleted [46].

Assessment of the Structural Model/Inner Model: Only after the completing of the measurement model examination, the estimation of the structural model can be start. It is observe the supposition of regression and relationship of variable.

As Hair *et al.,* in 2014 [48] suggested, there are five steps of structural model assessment procedure. First, the collinearity issue was assessed, and then followed by the estimation of the significance and relevant of the structural model relationships. This is continued by the assessment of coefficient (R2) level and effect size (F2). The assessment of predictive relevance (Q2), and the q2 effect sizes were the last step of structural model examinations. In addition for this study, the assessment of mediation effects was examined before the end of the data analysis. There are more detail are given in the following sections about the assessment of structural model of study.

Collinearity Assessment: The first step in the estimation of structure of model is to observe the collinearity issues. Collinearity refers to the high correlation between two indicators [48]. According to the results all variables have assessed the threshold values of collinearity in which tolerance greater than 0.20 and VIF less than 5 thus, there is no multicollinearity existed. Specifically, the tolerance and VIF of all variables are fall into the range between 0.243 and 0.439, and between 2.278 and 4.122 respectively.

Structural Model Path Coefficients: The path coefficient in PLS-SEM is similar to the standardized beta coefficient in regression analysis. 5000 bootstrap samples were selected to ensure that every model parameter has practical sampling division and the normal deviation of the division is serving as alternative of the parameter's empirical standard error [46]. In order to understand the significance level, the critical values for one-tailed test was used, 2.33 (significance level = 1%), 1.96 (significance level = 5%), and 1.28 (significance level = 10%). Based on the results, all direct hypotheses were accepted. Results found similar to the earlier researchers [23, 28, 37]. Some of the researchers were found with opposing results [21, 13, 51].

Table 3.

	Original Sample (O)	T Statistics (|O/STDEV|)	P Values
Cultural capa -> Supply Chain Performance	0.227	2.779	**0.006**
Green Supply Chain Management -> Supply Chain Performance	0.304	6.105	**0.000**
Relational capa -> Supply Chain Performance	0.250	3.085	**0.000**
supply chain capability -> Supply Chain Performance	0.215	2.237	**0.000**

V. IMPLICATIONS OF THE STUDY

The current body of knowledge affecting to the operational performance of supply chain is contributed by the combinations of findings of this study. The contributions of the present study can be classified into two significant implications, which is academic implications (theoretical implications) and managerial implications (practical implications). The theoretical implications can specifically be viewed from three aspects, namely empirical implications, conceptual implications, and methodological implications.

The implications of this research would insert value to the current body of knowledge in the subject matter specifically from the academia perspective. The effect of capabilities and adoption of supply chain technology towards operational performance of supply chain as indicated by survey results are imperative to textile and apparel companies who pursue capabilities and adoption of supply chain technology as capability to achieve better operational performance come under the organization perspective. In the following section all these implications are discussed.

VI. DISCUSSION AND CONCLUSION

Currently in business the competition is no longer between the firms but between the chains. The nature of business competition has increasing the intention on supply chain performance. This practice emphasized the need of adoption of supply chain technology to facilitate SCM. To provide a competitive model for current business environment, this study examined the relationship of supply chain capabilities, namely relational capability, information technology capability, and organizational culture capability on supply chain operational performance. This study further investigates whether supply chain technology adoption mediates the relationship between supply chain capabilities and supply chain operational performance. Certainly have no benefits happens instantaneously. The potential benefits can be recognized only if the interrelationships between supply chain capabilities are aligned to use and value of adoption of supply chain technology.

Quantitative findings of research findings offer considerable empirical support for the model under study.

Three out of four major research hypotheses have been fully maintained, while one research hypothesis has been partial supported. The empirical findings of this study recognized the contribution of relational capability, organizational culture capability, and adoption of supply chain technology towards supply chain operational performance. IT capability was the only factor that is not given any relationship to supply chain operational performance. The empirical findings further revealed that adoption of supply chain technology appreciated the contribution of supply chain capabilities. In addition to the empirical findings, the mediating effect of adoption of supply chain technology successfully contributed to the relationships of supply chain capabilities and supply chain operational performance.

The last model has been accepted by business specialists with the proposal of two terms in development, to be specific human help and understanding of work as mediators for a future examination of the model. These discoveries are based on associations of materials and clothing to constantly contribute or redesign key methodologies with individuals in the internal and external supply chain.

Therefore, this research has joined the writing of SCM through its receipt of an asset-based view hypothesis, dissemination of progress hypotheses and innovation association condition hypothesis all

the time. Therefore, this study recommends useful improvement systems for the Chinese materials and clothing associations. However, some restrictions on this research were recognized and proposals for a future review were soon discussed to rate the information on the model under review.

Theoretical Implications: The theoretical implications generally known as academic implications can be viewed from three aspects. These three aspects are empirical implications, conceptual implications, and methodological implications and are presented in the following sub-sections.

Conceptual Implications: SCM theories on "Resource Based View", "Diffusion of Innovation", and "Technology-Organization-Environment model" and present study are in consistent.

According to Wernerfelt, (1984), (1995) [49, 50] the culmination of these theories is referred to the ability of firms to build, integrate, reconfigure, and apply relational assets, internal and external competence, heterogeneous resources, capabilities through technological innovation and reciprocated interactions [21] and organizational innovativeness [51, 53], to address quick-change markets and meet new challenges. This is to help firm to continually improve and shape the performance as described by some researchers [52, 54], to gain competitive advantages and further change the short run competitive advantage to continued competitive advantage.

The combination of these theories provoked contemporary thinking in this study where the relationship between capabilities of supply chain, including relational capability, IT capability and organizational culture capability must be addressed to get better operational performance of supply chain through adoption of supply chain technology. This research has significantly reinforced these theories by showing the comprehensive framework and adds to the body of knowledge.

Practical Implications: In addition to aforementioned theoretical contributions, various practical implications known as managerial implications for practitioners are also offered by this study. In management practice the findings of this study have contributed in three major ways. These include

— The importance of relational capability, IT capability, and organizational culture capability as significant supply chain capabilities is revealed

— The importance of adoption of supply chain technology as a significant reciprocated interactions tool is revealed and

— The importance of adoption of supply chain technology as a significant mediating variable on the relationship between supply chain capabilities and operational performance of supply chain is revealed as well.

The evidence provided by the finding of this research states that to improve supply chain performance, most of the organization focus on supply chain capabilities and the adoption of supply chain technology. Approximately 90% of the responding companies have concerned on supply chain operational performance, while approximately 75% and 90% of the responding companies have used and felt useful toward the adoption of supply chain technology on SCM respectively as indicated by the findings of study while approximately 90% of the responding companies showed a great concern towards their companies' supply chain capabilities.

An insight into companies, especially in the textile and apparel industry with the notion of leveraging supply chain capabilities and adoption of supply chain technology in their businesses has positive relationship to operation performance is offered by the findings of the present research.

The empirical findings of this study along with statistical evidence have culminations of the conceptual model into a comprehensive framework. The importance of supply chain capabilities and the adoption of supply chain technology in improving operational performance of supply chain are demonstrated by comprehensive framework. As on the evaluation of SCM most of the companies or industrial practitioners lack comprehensive understanding therefore for the industrial practitioners as a managerial tool to estimate their operational performance of supply chain this study provides the research framework. Moreover to achieve business goals the industrial practitioners can use this research framework as well.

Interviewees also indicated that increased use of supply chain technology might lead to the enhancement in the supply chain operational performance. The use and the usefulness of supply chain technology has acted as a mediator particularly in the existing business environment, mediating the relationship between operational performance and capabilities of supply chain.

It could be concluded from this perspective that most of the companies perceived the mediating effect in business operation as well as the importance of adoption of supply chain technology. Therefore practitioners are advised to keep track of the adoption of the supply chain technology of their main competitors. It's important note that as the adoption of supply chain technology has acted as a mediator in the majority of the cases, therefore practitioners are advised to address SCM, right supply chain technology being their first choice.

The order for consultancy work on supply chain technology might substantially increase referring to the detail that there is possible increase in the adoption of supply chain technology. Thus the aspect of supply chain capabilities could be considered by the service providers or the products developers of supply chain technology. However, in order to effectively respond to users' future demands, the service providers or the products developers must build up sufficient and up to date expertise on particular supply chain technology.

Currently between the firms competition is no longer, but between the supply chains. The growing business competition is focusing more on performance of supply chain and to facilitate SCM this practice accentuate the need of adoption of supply chain technology. This study observed the relationship of supply chain, namely relation, IT and organizational culture capabilities on operational performance of supply chain to provide a competitive model for current business environment. Whether adoption of supply chain technology mediates the relationship between supply

chain capabilities and operational performance of supply chain is further investigated by this study. No benefit happens instantaneously. If the interrelationships between supply chain capabilities are aligned with use and value of adoption of supply chain technology only then potential benefits can be realized.
For the model under study, quantitative research findings offer considerable empirical support. One out of four research hypotheses has been partial supported while the other three out of four have been fully supported. The contribution of relational capability, organizational cultural capabilities, and adoption of supply chain technology towards operational performance of supply chain has been recognized by the empirical findings of this study. The only factor that is not given any relationship to operational performance of supply chain was IT capability. The adoption of supply chain technology appreciated the contribution of supply chain capabilities is further revealed by the empirical findings of the study. Moreover the mediating effect of adoption of supply chain technology successfully contributed to the relationships of capabilities and operational performance of supply chain in addition to the empirical findings.
The industry experts have been agreed with the final model suggesting two emerging terms as moderators for future study on the model, namely human support and work experience. The textile and apparel organizations are expected to be supported for continuous investment or reengineer key strategies with internal supply chain members and external as well. Through its adoption of resource based view theory, diffusion of innovation theory, and technology-organization-environment theory simultaneously, this study has contributed to the literature of SCM and in turn suggests useful improvement strategies for Chinese textile and apparel organization. Some limitations of this study were identified however recommendations were discussed to extent the knowledge of the model under study for future study.

VII. LIMITATIONS AND FUTURE SCOPE

Although the exploration presents rapid discoveries and adds to the hypothetical and useful confirmations, there are some confinements that must be addressed. The confinements are predominantly in relation to the system and the generalization of the investigation. Such confinements are mostly caused by time and cash limitations. The key exam restrictions are shown in the attached segments.
The recommendation is provided based on the needs of current context, since there is still limited study employed mixed method research design in textile and apparel industry. This is because the mixed method research design can provide better understanding on the particular issue by using the strengths of one method to overcome the weaknesses of the other method in order to provide stronger justification.
This is a primary study that looking to total supply chain, which is internal and external supply chain processes on textile and apparel industry. This means that this study looking for the total supply chain that contains of supplier, manufacturer, distributor, service provider, wholesaler, retailer, and customer in textile and apparel industry.
As third recommendation for future study, the future researchers can narrow the focus on a particular internal supply chain to get deeper information on how supply chain capabilities and adoption of supply chain technology contribute to financial performance of a company. This is suggested based on the interest of real business world, since the practitioners are more excited in financial performance in nature.
Last and most importantly, as stated in generalizability limitation of this study, future researches in other industries and different countries would be advisable. This is to increase the conceptualizations, measurement scales, and generalizability of the findings. Even though, a replication of this study would further advance the knowledge on this subject matter, since the model of the study is considered as fresh in the research context. However, more research on this topic needs to be undertaken.

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REFERENCES

[1]. Euro monitor International. (2016). Apparel in Malaysia.

[2]. Shahzad, I., & Bhatti, K. (2008). Antecedents of compensation and relationship among compensation, motivation, and organizational profitability. *The Business Review, Cambridge, 10*(2), 236-247.

[3]. Shahzad, I. A., Raju, V., Farrukh, M., Kanwal, N., & Ikram, M. (2018). Quality of work life: a significant dimension of non-financial compensation or managers' tool to generate reciprocity. *International Journal of Human Resource Studies, 8*(3), 218-240

[4]. Shahzad, I. A., Farrukh, M., Yasmin, N., (2020). Career Growth Opportunities as Non Financial Compensation - A New Induction: Reciprocation of Performance by Combining Social Exchange Theory & Organizational Support Theory. *TEST Engineering & Management, 83,* 16905-16920.

[5]. Lam, J. K., & Postle, R. (2006). Textile and apparel supply chain management in Hong Kong. *International Journal of clothing science and technology, 18*(4), 265-277.

[6]. Islam, M. M., Khan, A. M., & Islam, M. M. (2013). Textile industries in Bangladesh and challenges of growth. *Research Journal of Engineering Sciences, 2*(2), 31-37.

[7]. Keough, K., & Lu, S. (2020). Explore the export performance of textiles and apparel 'Made in the USA': a firm-level analysis. *The Journal of The Textile Institute,* 1-10.

[8]. Ramayah, T., & Omar, R. (2010). Information exchange and supply chain performance.

[9]. Shahzad, I. A., Bhatti, K. K., & Khalid, G. K. (2007). Impact of Technological Change on Human Resource Development Practices in Pakistan: An Analytical Study. *International Review of Business Research Papers, 3*(2), 400-419.

[10]. Shahzad, I. A., Farrukh, M., Ahmed, N. O., Lin, L., & Kanwal, N. (2018). The role of transformational leadership style, organizational structure and job characteristics in developing psychological empowerment among banking professionals. *Journal of Chinese Human Resource Management, 9*(2), 107–122.
[11]. Power, D., & Simon, A. (2004). Adoption and diffusion in technology implementation: A supply chain study. *International Journal of Operations & Production Management, 24*(6), 566–587.
[12]. Sukati, I., Hamid, A. B., Baharun, R., & Yusoff, R. M. (2012). The study of supply chain management strategy and practices on supply chain performance. *Procedia-Social and Behavioral Sciences, 40*, 225-233.
[13]. Basheer, M., Siam, M., Awn, A., & Hassan, S. (2019). Exploring the role of TQM and supply chain practices for firm supply performance in the presence of information technology capabilities and supply chain technology adoption: A case of textile firms in Pakistan. *Uncertain Supply Chain Management*, *7*(2), 275-288.
[14]. Xiao, L. (2008). The impact of dynamic IT capability and organizational culture on firm performance. George Washington University.
[15]. Fey, C. F., & Denison, D. R. (2003). Organizational culture and effectiveness: can American theory be applied in Russia ? *Organization science, 14*(6), 686-706.
[16]. Naing, T. H., & Fei, Y. S. (2015). Multinationals, technology and regional linkages in Myanmar's clothing industry. *Asia Pacific Business Review*, 1–19.
[17]. Cooper, W. D. (2010). Textile and apparel supply chains for the 21st century. *Journal of Textile and Apparel, Technology and Management, 6*(4), 1–10.
[18]. Lee, K. L. (2015). Relationship of supply chain capabilities and supply chain technology adoption towards supply chain operational performance in textile and apparel industry (Doctoral dissertation, Universiti Utara Malaysia).
[19]. Millet, P. A., Schmitt, P., & Botta-Genoulaz, V. (2009). The SCOR model for the alignment of business processes and information systems. *Enterprise Information Systems, 3*(4), 393–407.
[20]. Humphreys, P., Fynes, B., & Wiengarten, F. (2014). Creating business value through e-business in the supply chain. In F. J. Martínez-López (Ed.), *Handbook of Strategic E-Business Management,* 237–254.
[21]. Halldorsson, A., Kotzab, H., Mikkola, J. H., & Skjøtt-Larsen, T. (2007). Complementary theories to supply chain management. *Supply chain management: An International Journal*, *12*(4), 284-296.
[22]. Christopher, M. (2005). *Logistics and supply chain management: creating value-adding networks*. Pearson education.
[23]. Handfield, R. B., & Nichols, E. L. (2002). Supply chain redesign: Transforming supply chains into integrated value systems. Financial Times Press: Prentice Hall.
[24]. Schein, E. H. (2004). Organizational culture and leadership (3rd ed.). USA: Jossey- Bass.
[25]. Gilaninia, S., Mousavian, S. J., Tayebi, F., Panah, M. P., Ashouri, S., Touhidi, R., Seighalani, F. Z. (2011). The impact of information technology application on supply chain performance. *Interdisciplinary Journal of Contemporary Research in Business, 3*(8), 489–497.
[26]. Sukwadi, R., Wee, H. M., & Yang, C. C. (2013). Supply chain performance based on the lean–agile operations and supplier–firm partnership: An empirical study on the garment industry in Indonesia. *Journal of Small Business Management*, *51*(2), 297-311.
[27]. Chen, I. S. N., & Fung, P. K. O. (2013). Relationship configurations in the apparel supply chain. Journal of Business & Industrial Marketing, 28(4), 303–316.
[28]. Thoo, A. C., Hamid, A. B. A., Huam, H. T., Baharun, R., Yusof, R. M., & Rasli, A. (2011). The proposed conceptual model for investigating moderating effects of contextual factors on supply chain management practice-performance link in Malaysian small and medium enterprises. *International Journal of Business and Management, 6*(12), 135–146.
[29]. Scupola, A. (2012). ICT adoption in facilities management supply chain: the case of Denmark. *Journal of Global Information Technology Management, 15*(1), 53-78.
[30]. Hendarty, H., & Nusantara, B. (2014). Information sharing and information quality at a chocolate firm. *International Journal of Information, Business and Management*, 6(4), 73–86.
[31]. Lynn, J. A. (2019). *Feeding Mars: Logistics in Western Warfare from the Middle Ages to the Present*. Routledge.
[32]. Lai, K.-S., & Yusof, N. A. (2011). Organizational culture and innovation adoption/generation: A proposed model. World Academy of Science, *Engineering and Technology, 58*, 268–274.
[33]. Nahm, A. Y., Vonderembse, M. A., & Koufteros, X. A. (2004). The impact of organizational culture on time-based manufacturing and performance. *Decision Sciences, 35*(4), 579–607.
[34]. Huisman, W., & Smits, M. (2007). Investing in networkability to improve supply chain performance. In System Sciences, 2007. HICSS 2007. *40th Annual Hawaii International Conference,* 1–9.
[35]. Kamaruddin, N. K., & Udin, Z. M. (2009). Supply chain technology adoption in Malaysian automotive suppliers. *Journal of Manufacturing Technology Management, 20*(3), 385–403.
[36]. Lim, H., & Istook, C. L. (2012). Automatic pattern generation process for made-to-measure. *Journal of textile and Apparel, technology and Management, 7*(4), 1-11.
[37]. Iyer, K. N. S. (2011). Demand chain collaboration and operational performance: Role of IT analytic capability and environmental uncertainty. *Journal of Business & Industrial Marketing, 26*(2), 81–91.
[38]. Farrukh, M., Alzubi, Y., Shahzad, I. A., Waheed, A., & Kanwal, N. (2018). Entrepreneurial intentions: The role of personality traits in perspective of theory of planned behaviour. *Asia Pacific Journal of Innovation and Entrepreneurship, 12*(3), 399–414.
[39]. Farrukh, M., Lee, J. W. C., & Shahzad, I. A. (2019). Intrapreneurial behavior in higher education institutes of Pakistan. The role of leadership styles and psychological empowerment *Journal of Applied Research in Higher Education, 11*(2), 273-294.
[40]. Farrukh, M., Meng, F., Sajid, M., & Shahzad, I. (2020). Does strategic fit matter in measuring

organizational performance? An empirical analysis. *Corporate Social Responsibility and Environmental Management*.
[41]. Farrukh, M., Sajid, M., Lee, J. W. C., & Shahzad, I. A. (2020). The perception of corporate social responsibility and employee engagement: Examining the underlying mechanism. *Corporate Social Responsibility and Environmental Management*, *27*(2), 760-768.
[42]. Farrukh, M., Ting, H., Shahzad, I. A., & Hua, Z. (2018). Can incivility impede knowledge sharing behaviour? *International Journal of Information Systems and Change Management, 10*(4), 295–310.
[43]. Peter, J. P. (1979). Reliability: A review of psychometric basics and recent marketing practices. *Journal of Marketing Research, 16*(1), 6–17.
[44]. Hair Jr, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2007). Multivariate data analysis, Ch. 1, 2 & 4.
[45]. Nunnally, J. C., & Bernstein, I. H. (1994). Psychometric theory (3rd ed.). New York, NY: McGraw-Hill.
[46]. Hair Junior, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2014). A primer on partial least squares structural equation modeling (PLS-SEM).
[47]. Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The use of partial least squares path modeling in international marketing. In New Challenges to International Marketing. *Advances in International Marketing,* 277–319.
[48]. Hair, J. F., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014). Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research. *European Business Review, 26*(2), 106–121.
[49]. Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic management journal*, *5*(2), 171-180.
[50]. Wernerfelt, B. (1995). The resource-based view of the firm: Ten years after. *Strategic management journal*, *16*(3), 171-174.
[51]. Rogers, E. M. (1995). Innovation of diffusion (4th ed.). London, New York: Free Press. Rogers, E. M. (2003). Diffusion of innovations (5th ed.). London, New York:
[52]. Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal, 18*(7), 509–533.
[53]. Vashisht, S., & Ahamad, S. (2012). Supply Chain Management for Human Life Betterment: An ISM analysis. *International Journal on Emerging Technologies,* 149-156.
[54]. Singh, T. S., & Sunildro L.S. Akoijam (2020). Supply Chain Management of Food Processing Industry in Manipur: Challenges and Perspectives. *International Journal on Emerging Technologies, 11*(1), 36-42.
[55]. Fornell, C., & Larcker, D. F. (1981). Structural equation models with unobservable variables and measurement error: Algebra and statistics.

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