

**THE IMPACT OF SUPPLY CHAIN MANAGEMENT
PRACTICES ON THE OVERALL PERFORMANCE OF THE
FAN INDUSTRY**

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**IŞIK UNIVERSITY
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ABSTRACT

According to UNIDO (United Nations Industrial Development Organization) and TRTA (Trade-Related Technical Assistance Program), Pakistan's contribution to global fan trade is barely 1.3 %. The industry has experienced rapid expansion in recent years, but it is plagued by low productivity, outdated equipment, and a lack of knowledge. Because these institutions are opposed to change, Pakistan's fan business cannot compete with its overseas counterparts. Supply chain management methods have been shown in studies to increase a firm's overall performance by boosting competitive advantage and more efficient production. Supply chain management at the top level could improve results and improve organizational performance. The objective of this thesis is to explore the effects of supply chain management strategies on the performance of the organization of fan manufacturing SMEs in Pakistan. A questionnaire was given to 120 different fan manufacturing companies for data collection purposes, with an 83.33 percent response rate. The findings suggest that strategic supplier partnerships and supply chain management methods improve organizational performance. These findings show that many SMEs in the fan manufacturing industry are aware of supply-chain strategies to manage and employ them to improve their companies' performance. It is the first research in Pakistan about the influence of supply chain management practices on the organizational performance of fan manufacturing SMEs, to the best of my knowledge. As a result, this research is contributing to the field of supply chain management. Furthermore, it serves as a foundation for Pakistan's industrial sector, particularly the fan industry, in terms of supply chain management.

TEDARİK ZİNCİRİ YÖNETİM UYGULAMALARININ FAN SEKTÖRÜNÜN GENEL PERFORMANSINA ETKİSİ

ÖZET

UNIDO (Birleşmiş Milletler Endüstriyel Kalkınma Örgütü) ve TRTA'ya (Ticaretle İlgili Teknik Yardım Programı) göre, Pakistan'ın küresel fan ticaretine katkısı sadece % 1,3'tür. Endüstri son yıllarda hızlı bir genişleme yaşadı, ancak düşük üretkenlik, modası geçmiş ekipman ve bilgi eksikliği ile boğuşuyor. Bu kurumlar değişime karşı olduğu için, Pakistan fan endüstrisi denizaşırı meslektaşlarıyla rekabet edemez. Tedarik zinciri yönetimi yöntemleri, rekabet avantajını ve daha verimli üretimi artırarak bir firmanın genel performansını artırmaya yönelik çalışmalarda gösterilmiştir. En üst düzeyde tedarik zinciri yönetimi, sonuçları iyileştirebilir ve organizasyonel performansı artırabilir. Bu tezin amacı, tedarik zinciri yönetimi stratejilerinin Pakistan'daki fan imalat KOBİ'lerinin organizasyonunun performansı üzerindeki etkilerini araştırmaktır. Veri toplama amacıyla 120 farklı fan üreticisi şirkete anket uygulandı ve yanıt oranı yüzde 83,33 oldu. Bulgular, stratejik tedarikçi ortaklıklarının ve tedarik zinciri yönetimi yöntemlerinin organizasyonel performansı artırdığını göstermektedir. Bu bulgular, fan imalat endüstrisindeki birçok KOBİ'nin, şirketlerinin performansını artırmak için bunları yönetmek ve kullanmak için tedarik zinciri stratejilerinin farkında olduğunu göstermektedir. Bu çalışma, Pakistan'da tedarik zinciri yönetimi uygulamalarının fan üretimi KOBİ'lerinin organizasyonel performansı üzerindeki etkisi hakkındaki ilk araştırmadır. Sonuç olarak, bu araştırma tedarik zinciri yönetimi alanına katkıda bulunmaktadır. Ayrıca, Pakistan'ın sanayi sektörü, özellikle de fan endüstrisi için tedarik zinciri yönetimi açısından bir temel oluşturmaktadır.

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DEDICATION

I dedicate this work to my parents, family members, companions, and a worthy respected supervisor who has helped me all this during this study. I'm appreciative to them for their direction and support in all periods of my academic and my own life.

TABLE OF CONTENTS

ABSTRACT	ii
ÖZET	iii
ACKNOWLEDGMENTS	iv
DEDICATION	v
TABLE OF CONTENTS	vi
LIST OF TABLES	viii
LIST OF FIGURES	ix
CHAPTER 1	1
1. INTRODUCTION	1
CHAPTER 2	5
2. LITERATURE REVIEW.....	5
2.1 Strategic partnership with suppliers (SPS).....	5
2.2 Internal supply chain practices (ISCP).....	6
2.3 Customer relationship management (CRM) /Level of information sharing ...	6
2.4 Supply Chain Management Practices (SCMPs).....	7
2.5 Organizational performance (OP).....	8
CHAPTER 3	10
3. RESEARCH METHODOLOGY.....	10
3.1 Research Methodology	10
3.2 Theoretical Framework.....	11
3.3 Research Design.....	12
3.4 Population Frame	12
3.5 Sampling Technique	13
3.6 Sample size	13
3.7 Data collection	13
3.8 Measurement scale.....	13
3.9 Hypothesis.....	14

3.10 Data Analysis	14
3.10.1 Validity Analysis	15
3.10.2 Reliability Analysis.....	16
3.10.3 Descriptive Statistics.....	17
3.10.3.1 Strategic Partnership with Suppliers.....	17
3.10.3.2 Internal Supply Chain Management Practices.....	20
3.10.3.3 Customer Relationship Management.....	22
3.10.3.4 Supply Chain Practices	25
3.10.3.5 Organization Performance	27
3.10.4 Correlation Analysis	29
3.14.1 Correlation Analysis amongst OP and SCM practices	29
3.10.5 Simple Linear Regression	30
3.10.5.1 Strategic Partnership with Suppliers.....	30
3.10.5.2 Internal Supply Chain Management	32
3.10.5.3 Customer Relationship Management.....	33
3.10.5.4 Supply Chain Practices	34
3.10.6 Multiple Regression Analysis.....	35
CHAPTER 4	42
4. RESULTS AND CONCLUSIONS	42
4.1 Results and Conclusion.....	42
4.2 Discussion	43
4.3 Limitations	44
4.4 Conclusion	44
4.5 Recommendations.....	45
4.6 Future Research.....	45
REFERENCES	48
CURRICULUM VITAE.....	52

LIST OF TABLES

Table 1.1 Operational Definitions.....	5
Table 3.1 Questionnaires adopted for measuring the factors.....	16
Table 3.2 Response Rate of Questionnaires.....	17
Table 3.3 Summary of Reliability Analysis.....	18
Table 3.4 Descriptive Statistics for SPS	19
Table 3.5 Descriptive Statistics for ISCM	21
Table 3.6 Descriptive Statistics for CRM	23
Table 3.7 Descriptive Statistics for SPS	26
Table 3.8 Descriptive Statistics for OP	28
Table 3.9 Relationship between SCM and Supply Chain Performance.....	30

LIST OF FIGURES

Figure 3.1 Theoretical Framework.....	12
Figure 3.2 Pie-charts of Q1a-n of SPS	20
Figure 3.3 Pie-charts of Q2a-l of ISCM.....	22
Figure 3.4 Pie-charts of Q3a-t of CRM.....	25
Figure 3.5 Pie-charts of Q4a-n of SPS	27
Figure 3.6 Pie-charts of Q5a-n of OP.....	29
Figure 3.7 Simple linear regression result of SPS.....	33
Figure 3.8 Simple linear regression of results of ISCM.....	34
Figure 3.9 Simple linear regression results of CRM.....	35
Figure 3.10 Simple linear regression results of SCMPs	36
Figure 3.11 Multiple regression results.....	39
Figure 3.12 Multiple regression results without CRM and ISCM.....	40

LIST OF ABBREVIATIONS

UNIDO:	United Nations Industrial Development Organization
SPSS:	Statistical Package for Social Sciences
SME:	Small Medium Enterprises
SPS:	Strategic Partnership with Suppliers
ISCM:	Internal Supply Chain Management
CRM:	Customer Relationship Management
SCMPs:	Supply Chain Management Practices
OP:	Organizational Performance
TRTA:	Trade-Related Technical Assistance Program
PEFMA:	Pakistan Electric Fans Manufacturers Association
SCM:	Supply Chain Management

CHAPTER 1

1.INTRODUCTION

To improve performance as well as stay competitive in the market, an important and valuable way is to effectively manage the supply chain. This way, firms remain competitive in the market due to stiff competition between them. Li et al. (2006) state in their study that the concept of SCMPs received acceptance in the very early 1990s when the world had to struggle on the international level for low-cost products and services. In the early 1990s, the worldwide market was facing huge competition to deliver the appropriate items or services at the appropriate time and right place. Fan industry organizations around the world are now competing in local markets and fan firms and their supply chain must be catered for to increase overall efficiency. Thus, for this purpose, fan organizations now must understand the concepts of SCM to increase competitiveness and overall profit. Tan et al. (2002) reveals in their paper that business managers, academic scholars, and consultants emphasize SCM.

SCM involves approaches, culture, value for money, vision, quality, and the best possible flow of innovative and other reliable resources and suppliers and then supplies high-quality products to consumers that they manufacture at a very economical price. The significance of SCM in the fan business has expanded, and it is now recognized as a necessary tool for fan organizations to compete effectively.

Advances in communications and information technology have made it hard to provide and exchange information in real-time, although this aspect significantly affects the supply chain's overall performance (Rached, Bahroun, & Campagne, 2015). Organizations are urged to reveal information, however, the exchange of information may alter owing to supply and demand uncertainties, as well as the advantages and

drawbacks of the firms. This hinders the adoption of sustainable business based on the exchange of information (Fraccascia & Yazan, 2018).

Continuous variation also includes the fact that organizations work with increasing volume and tremendous diversity of information. As such, managerial directors are very concerned about this to improve the quality of information that they must make decisions and plan goals. Most companies also must target the changing needs of consumers because environmental instability may disturb the production process which include changes in demand patterns, failures of machines, fluctuations in finance, and many others. Similarly, the variable of uncertainty should also be considered (Sagawa & Nagano, 2015).

On the other side, customer relationship management is critical in business, and employees from a variety of firms use it daily. Customer relationship management is critical for a multitude of reasons, including facilitating reciprocal information access. The approach also gives comprehensive information that helps achieve organizational objectives (Al-Weshah, Al-Manasrah, & Al-Qatawneh, 2019).

ISCM refers to the flow of activities within a business that ends with the delivery of a product to the customer. Numerous business operations, including sales, manufacturing, and distribution, are involved in this process (Kalsoom, Khan, & Zubair, 2018). Although the current scenario has already been studied worldwide, it has not been studied especially in-depth in the context of the fan industry in Pakistan.

Further, organizations are also gradually adopting strategic alliances with suppliers to improve inter-organizational cooperation in their supply chains. There are also some significant hurdles and accomplishments in terms of managing their supply levels. It also relies on how it affects consumer satisfaction, as the impact of partnerships with diverse marketers and suppliers on the supply chain and organizational performance is unknown (Wafula & George, 2015).

This thesis analyzes the knowledge gap between supply chain practices and OP. According to UNIDO and TRTA, Pakistan's fan sector has experienced rapid expansion in recent years, but it is plagued by low productivity, limited technology upgrades, and a skills deficit (TRTA, 2010). Most of these small-scale fan manufacturers in Pakistan are family-owned businesses that lack skilled labor and use traditional production processes of fan manufacturing. Because these institutions are averse to change, the Pakistani fan sector is unable to compete in price with its overseas counterparts. A typical firm's average capacity is roughly 200-300 fans per day, which

is exceedingly low when compared to Chinese peers, whose average output is 45-50,000 fans per day (TRTA, 2010). According to Hussain et al. (2014), Wijetunge (2017) and Li et al. (2006), industries in Pakistan and overseas demonstrate that SCMPs boost a firm's overall performance by boosting its competitive advantage and effective output. SCM at higher levels may lead to increased competitive advantages and greater corporate performance. Hussain et al. (2014) suggested that SCMPs increase the performance of the food processing industry, but the literature lacks to carry out any research on a large population, and the samples were taken collectively from all types of manufacturing industries. In this study, data is collected from 100 SMEs based in Gujrat and Gujranwala, Pakistan. Overall, SPS, CRM, ISCM, and SCP have been tested individually to determine the OP of the Pakistani fan manufacturing SMEs.

Li et al. (2006) state that SCMPs uniquely point out the strategic properties of organizational business partners and highlights that they improve overall OP. Throughout this research, I want to see how supply chain practices affect the success of Pakistani fan manufacturing SMEs.

At the present, SMEs play a very critical role in the growth of the economy, reducing poverty, innovation, and creating employment. This study focuses on various aspects of SCM. The goal of the study is to investigate a model that explains the link between organizational performance and SCM practices. It is intended that this study of supply chain management methods will also assist scholars in better understanding the boundaries and metrics linked with SCM, along with the implications of SCM. By developing an appropriate model for analyzing SCM practices and obtaining experimental data on the effects of SCM on competitive advantages and OP, this research is expected to provide some beneficial guidelines for future research on this subject. As a result, this study is highly useful in evaluating how SCMPs might help enhance the overall performance of fan manufacturing SMEs in Pakistan.

Table 0.1 shows the operational definitions of the different five variables definitions that I have used in this research. The objective of this study is as follows:

The goal of this study is to determine how SCM strategies affect overall performance and the extent to which SMEs engaged in Pakistani fan manufacturing use these strategies.

Table 0.1 Operational Definitions

Variables	Definitions	Reference
SCMPs	The company engages in several actions to improve SCM effectiveness.	Li, Ragu-Nathan, Ragu-Nathan, and Rao (2006)
SPS	It means the prolonged-range alliance with organizations and their suppliers'	Li et al. (2006)
CRM (Level of Information Sharing)	The importance of the statistics provided exclusively among organizational supply chain partners.	Monczka, Petersen, Handfield, and Ragatz (1998)
ISCP	The application of delaying one or more SCM processes, such as production, sourcing, and conveyance, is known as the internal supply chain process (ISCP), sometimes known as rearrangement.	Kalsoom, Khan, and Zubair (2018)
OP	It refers to how successfully the organization meets its objectives. Some people gauge the performance of businesses using non-financial performance.	Yamin and Mavondo (1999)

In this thesis, I answer the following research questions for fan manufacturing SMEs in Pakistan.

- Is there a positive impact on OP through SPS?
- Does CRM have a good impact on OP?
- Does the ISCM positively affect OP?
- Do the SCP positively impact OP?

CHAPTER 2

2.LITERATURE REVIEW

An overview of recent research is provided in this section. A literature study will be used to describe factors that influence organizational performance in this chapter.

2.1 Strategic partnership with suppliers (SPS)

SPS means strong relationships with firms and suppliers (Li, Ragu-Nathan, Ragu-Nathan, & Rao, 2006). According to former researchers, the goal of SPS is to affect corporate businesses' operational and strategic skills to enable them to realize huge future benefits (Monczka, Petersen, Handfield, & Ragatz, 1998). Furthermore, strategic partnerships emphasize direct associations, remotely and promote comprehensive planning and problem-solving work (Le, 2020). SPS enables businesses to operate more professionally with well-known suppliers who are ready to split products to succeed duties (Li, Ragu-Nathan, Ragu-Nathan, & Rao, 2006).

Strategic alliances with suppliers have a considerable and advantageous effect on organizational performance, according to past research (Wijetunge, 2017). Furthermore, SPS is an education that shows how a strategic partnership with vendors has a positive influence on innovation and plays a key role in modernization (Maalouf, 2018). This strategy focuses more on shared planning (reciprocal planning) and seeks to overcome common problems between suppliers and companies (Le, 2020).

The industrial sector of the Jordanian discovered that strategic collaborations with suppliers had no positive impact on the organization's performance (Al-Madi, 2017). Sukati et al. (2011) on the other hand found that SPS played a substantial influence in defining the firms' competitive advantage. Similarly, Habib et al. (2021) found that Strategic Suppliers Partnership was positively affecting the OP of the textile firms in

Pakistan. Khalil et al. (2019) also, found that strategic supplier partnerships had a favorable and meaningful impact on organizational efficiency and competitive edge. Businesses can collaborate more productively with numerous suppliers that want to divide the burden for producing and selling items by putting into practice a partner strategy with vendors. Vendors who take part in the product planning process from the beginning can provide additional cost-effective planning possibilities, trying to assist in the choice of the appropriate techniques and innovations, and providing support in design evaluation. Strategically related businesses can work together to cut down on time and effort wasted. A successful supply chain may be made up of a solid supplier partnership.

2.2 Internal supply chain practices (ISCP)

The delivery of a product to customers is the culmination of a series of company-wide activities known as the internal supply chain. Numerous business operations, such as sales, production, and distribution, are involved in this process (Aishah, Pyeman, & Tajuddin, 2021). ISCPs have improved the performance of the company (Wijetunge, 2017). Similarly, the ISCPs have a positive impact on innovation (Didonet & Diaz, 2012). Additionally, Al-Weshah et al. (2019) discovered that ISCPs had a positive effect on a company's organization's performance in the Jordanian Industrial Sector.

Furthermore, Aslam, Saleem, Khan, and Kim (2021) define that an organization's competitive edge requires careful consideration of ISCM. To measure supply chain practices, they find that as a multidimensional concept, SCM practices cover upstream and downstream supply chains as well as internal supply chains. In addition, their study showed a significant impact of SCM practices on organizational performance and competitive advantage. The results suggest that higher levels of SCM practices can increase competitiveness, profitability, and improved organizational performance. Also, competitive advantage can be a direct, positive impact on organizational performance.

2.3 Customer relationship management (CRM) /Level of information sharing

The degree to which the information is relevant and solely exchanged between organizational supply chain partners is referred to as the amount of information sharing, or customer relationship management (Monczka, Petersen, Handfield, & Ragatz, 1998). Joint information in organizations can shift from a tactical to a strategic level and from the company to clients who need information about the market (Al-Madi, 2017). Many researchers believe that exchanging information with supply chain partners might help improve company performance.

Customer relationship management has been shown to enhance organizational performance in prior research (Wijetunge, 2017). In the Jordanian industrial sector, however, Al-Weshah et al. (2019) reveals that CRM has a favorable impact on the organization's performance. Whereas Sukati et al. (2011) determine that strategic customer management has an important role in defining the company's competitive advantage. Similarly, Hashim et al. (2020) points out that customer relations management positively influences the performance of the textile company organization in Pakistan. Furthermore, Tan et al. (2002) found that customer relations management positively affected the company's performance. Similarly, Khalil et al. (2019) discovered that customer-relationship management has a large and favorable influence on competitive advantage as well as organizational performance.

2.4 Supply Chain Management Practices (SCMPs)

As stated by Li et al. (2006) SCMPs mean the combination of activities carried out in companies to improve SCM efficiencies. Several researchers use different SCMPs for example, supplier partnership, sustainable process flow, cycle time intensity, outsourcing, and technology information sharing. Tan et al. (2002) recommends six SCM elements. These include customer service management, geographic location, supply chain characteristics, exchange of information, supply chain performance, and real-time abilities. To measure supplier-buyer relations Chen and Paulraj (2004) recommend branded interaction, supplier-based abatement, cross-functional teams, prolonged associations, as well as the buyer's relationship steps. Tan et al. (2002) identifies customer, quality, and purchase relationships to represent SCMPs.

As a result, the literature depicts SCMPs from many views, but the goal is to improve OP. The Jordan industry saw improved corporate performance because of SCMPs (Al-Madi, 2017). Likewise, Sukati et al. (2011) determine that SCMPs are positively related to the company's competitive advantage. As well Habib et al. (2021) found that SCMPs affected the performance of the textile organizations in Pakistan. Secondly, Tan et al. (2002) found that SCMPs affected the company's performance. SCMPs have a good and significant impact on business performance as well as a competitive edge (Khalil, Khalil, & Khan, 2019).

2.5 Organizational performance (OP)

Organizational performance (OP) means how much the organization achieves the set goals. There are many studies available on the OP in the past but there is no general definition yet to determine the OP. Non-financial performance is used by some researchers to determine the OP. Some researchers use financial performance to assess an organization's performance (Yamin & Mavondo, 1999). According to UNIDO and TRTA, Pakistan has a very low share in the global trade of fans (Khan, 2010). There are over 450 Small Medium Enterprises (SMEs) producing fans in Pakistan. There are only a few large manufacturers who have their international product branding.

According to TRTA Pakistan, most of these small-scale fan manufacturers in Pakistan are family-owned businesses that lack skilled labor and use traditional production processes of fan manufacturing. The average production capacity of fan manufacturing industry of Pakistan is very low and these organizations are resistant to changes that makes it difficult for them to compete with their international rivals. Literature shows that research conducted in Pakistan and abroad shows that SCMPs improve the company's overall performance by increasing competitive advantage and efficient production. SCM at the top level can improve organizational performance and provide a competitive edge. Furthermore, a competitive edge can have a direct and beneficial effect on the OP (Li, Ragu-Nathan, Ragu-Nathan, & Rao, 2006). Although it has been studied in Pakistan that SCMPs improve the overall performance of consumer goods manufacturing industries but there is a gap in the literature as this research was conducted on a large population, and the sample was taken from all types of manufacturing industries (Hussain, Hussain, Akbar, Sulehri, & Maqbool, 2014). So, it has not been studied in the fan manufacturing industry, specifically. The objective

of this research is to ascertain the extent of SCMPs employed and to study the effects of SCMPs on the general performance of fan manufacturing SMEs.

To summarize this section of the study, one can realize the concept of the supply chain practices, their relationship with the organization's performance, and the findings of former research.

CHAPTER 3

3. RESEARCH METHODOLOGY

This chapter explains how to conduct exploratory research by using the survey method to create data and establish which supply chain aspects have an impact on organization performance. The survey participants will be from or those who are directly involved/handling supply chain operations. The techniques utilized to gather the data, participant information, and the procedures used to analyze the data are described in this chapter.

3.1 Research Methodology

Two main types of research methodologies exist, i.e.: the qualitative research approach and the quantitative research approach. The quantitative information doesn't extricate itemized data from the members however involves many members for the information so the outcomes can be summed up (Blessing & Chakrabarti, 2009). The quantitative approach is the place where the information assortment and examination of the information happens with the assistance of numbers (Babbie, 1998). The justification behind the appraisal of the information is to find the relationship between the factors and the affirmation or the dismissal of the speculation of the examination. Fair information assortment happens in the quantitative strategy because of which, the information can be diminished (Kothari, 2004). Since the review is gathering and examining a huge dataset, the exploration technique is a quantitative one.

There are two primary kinds of studies. They are known as the exploratory examination type and explanatory study type. The explanatory type has a huge significance because it helps in affirmation or dismissal of the hypothesis the review addressed completely (Kothari, 2004). The explanatory type helps with finding in-

depth results and explaining the phenomenon of the study. The explanatory exploration evaluates the factors addressing the conduct of individuals, and their activities and gives insights into the conditions where they can be affected (Snyder, 2019). Since the review is affirming a hypothesis, the review applies the exploratory study as the study type.

3.2 Theoretical Framework

SPS, CRM, ISCM, and SCMPs are independent factors in this study and can be described as arrangements used by any company to advance its SCM (Li, Ragu-Nathan, Ragu-Nathan, & Rao, 2006). OP is the dependent variable and can be characterized as the arrangement of standards used to gauge the degree to which an organization's performance in achieving its targets. Accordingly, I have developed a model as shown in Figure 3.1.

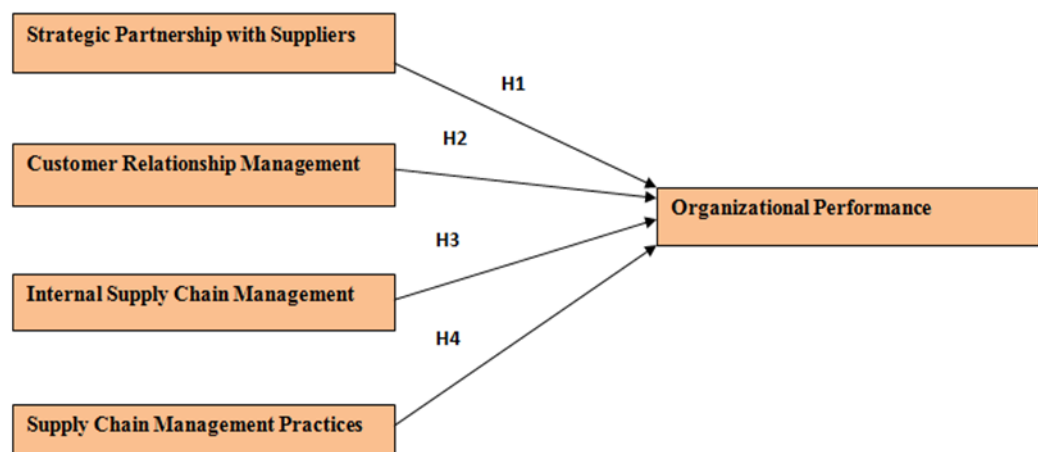


Figure 0.1 Theoretical Framework

To enhance long-term business performance and their supply chain, SCM practices include a variety of efficient ways and approaches to interact with manufacturers, distributors, suppliers, and customers (Chopra & Meindl, 2007). SCM practices are defined in this study as several management initiatives to enhance supply chain effectiveness (Wong, Arlbjorn, & Johansen, 2005).

In this study, SPS is the long-term partnership between an organization and its suppliers that shape the operational and policy capabilities of each participating

company to support them in achieving substantial continuous benefits (Li, Rao, Ragu-Nathan, & Ragu-Nathan, 2005). SPS entails making purchases from and influencing suppliers as well as enhancing their operational and system capabilities, value addition, and supply chain performance (Monczka, Petersen, Handfield, & Ragatz, 1998). Improved supplier coordination is necessary for SPS, and businesses must establish lasting, mutually beneficial partnerships with their suppliers.

According to Li et al. (2006), the customer relationship is the collection of all the strategies used to forge a lasting connection, handle customer issues, and raise customer satisfaction. The significance of information exchange in SCM practice is emphasized by Li et al. (2005). Information exchange across all parties in the supply chain is the fundamental tenet of SCM (Moberg, Cutler, Gross, & Speh, 2002). A company may communicate with those in the supply chain and react to shifting client demands more swiftly (Li & Lin, 2006).

According to Li et al. (2006), SCM is a multifaceted term that encompasses internal supply networks in addition to upstream and downstream supply chains. Additionally, their research showed that SCM techniques have a major impact on OP and competitive advantage. The result demonstrates how SCM practice at a high level can boost competitive advantage and foster OP. Competitive advantage can also directly and favorably impact OP.

3.3 Research Design

In the research configuration, Cooper, Schindler, and Sun (2008) and Veal (2005) recommended there are two principal sorts of research design. They are correlational and causal designs. The correlational exploration configuration manages the assessment of the relationship among the factors of the concentrate in principle, though, the causal examination configuration manages the reason and impact relationship among the factors of the review (Kumar & Phrommathed, 2005). The correlational examination configuration is utilized to affirm the hypothesis the review is introducing (Koul, 2009). Consequently, the correlational exploration configuration is applied since this review surveys the relationship between the factors of the study.

3.4 Population Frame

The population frame is the foundation material or device from which the sample is made. This is a list that contains every participant of the population that is being sampled and can consist of individuals, families, and organizations. In this research, our population size is all Fan Manufacturing SMEs based in two cities of Pakistan named Gujranwala and Gujrat. These cities account for 98% of the country's production. The sector consists of more than 450 SMEs, of which 300 are based in Gujarat and the rest in Gujranwala.

3.5 Sampling Technique

The sample for this study is collected using a simple random sample technique. In a simple random sampling model, a selection of participants from a population is randomly chosen by the researcher. Every participant has an equal probability of being selected. Then, information is gathered from the largest proportion of this random selection.

3.6 Sample size

Sample size makes the research quite easy because it is not possible to research all selected populations so that's why I've selected a unique sample that represents the population and the sample size is 100 Fan Manufacturing SMEs.

3.7 Data collection

The primary instrument of data collection is a questionnaire. Elements in the questionnaire have been validated based on previous research and included five variables and each variable contains different questions.

For data collection, I contacted a member of PEFMA (Pakistan Electric Fans Manufacturers Association) he helped me to build a connection with the coordinators of both chambers of commerce. They helped me to contact different firms. I visited these firms face to face to collect responses. Some firms refused to respond, and some of them returned to me at the same time because they asked me to read the statements, we will answer you. And most of them asked me to take it back after some days or

after a week. As I mentioned in the introduction that most SMEs are family-owned businesses. Most of the firms don't have specific departments and the owner himself is handling operations or one of his employees is handling multiple operations but there are also structured firms that have proper departments and work on a hierarchical based. So, I collected my response from those who are directly involved or handling the supply chain process and each response was from a different firm.

3.8 Measurement scale

A 5-Likert scale that ranges from 5 (Strongly Agree) to 1(Strongly Disagree) has been employed in this study.

3.9 Hypothesis

SCM procedure is projected to increase the cost of goods sold, investment return, and competitiveness globally. For example, Strategic Supplier Partnership's findings have published specific organizational economic advantages in terms of profitability. Customer relationship strategies are indeed revealed as references for how to be enhanced organizational performance. Real-world examples confirm the lower-level impacts of SCM techniques. According to a survey by Pittiglio, Rabin, Todd, and McGrath (PRTM), the strongest SCM companies have a 40% to 65% opportunity over the ordinary companies through their cash-to-cash cycle, and the leading companies receive 50% to 85% less inventory than their own competing companies (Sheridan, 2004). Sharing the information enables businesses to obtain stable shipments and launch products onto the market more quickly, which results in a better level of supply chain integration. While customer satisfaction will be determined positively by the quality of information as well as the exchange of information. However, internal supply chain practices not only enhance the supply chain flexibility but also improve customer feedback and global competence as well. Based on the foregoing information I have proposed the following hypothesis:

H1: SPS improves the OP of fan manufacturing SMEs in Pakistan.

H2: ISCP positively affects the OP of fan manufacturing SMEs in Pakistan.

H3: CRM improves the OP of fan manufacturing SMEs in Pakistan.

H4: SCMPs have a positive impact on the OP of fan manufacturing SMEs in Pakistan.

3.10 Data Analysis

For data analysis purpose, multiple regression analysis, simple linear regression, reliability analysis, validity analysis, and correlation analysis has been done. The goal of using this type of analysis is to enable hypothesis testing between four independent variables (ISCM, SPS, SCMPs, and CRM) and one dependent variable (Organization Performance).

3.10.1 Validity Analysis

The questionnaire is adapted from Nawaz (2020), Sukati et al. (2011), Al-Madi (2017), and Wijetunge (2017). The questionnaire was investigated and proven to be useful for measuring the variables considered, though for this research, it was dispersed to 120 fans manufacturing SMEs in Pakistan, and 100 responses were obtained.

This study is approved by Işık University Ethics Committee during the meeting dated 27.08.2021 and the decision numbered 2021_07.

The questions to form the questionnaire to conduct this research were collected from different research papers as shown in Table 0.1.

Table 0.1 Questionnaires adopted for measuring the factors

SPS	Questions 1, 2, and 6 - 14 are taken from Al-Madi (2017), and question 35 is taken from Nawaz (2020).
CRM	Questions 1 - 6, 9, and 10 are taken from Nawaz (2020), question 7 is taken from Sukati et al. (2011), and questions 8 and 11 - 20 are taken from Al-Madi (2017).
ISCM	Questions 1 - 9 are taken from Al-Madi (2017) and questions 10 - 12 are taken from Wijetunge (2017).
SCMP	Questions are taken from Al-Madi (2017).
OP	Questions 1 - 7 are taken from paper Nawaz (2020).

In their research, the above authors have used some different and some similar questions under each variable. For example, questions 3 to 5 of SPS were not present in the paper of Al-Madi (2017) so they are taken from Nawaz (2020). Similarly, for CRM, questions 1 to 6 and then 9 and 10 were present in Nawaz (2020) but questions 7, 8, and 11 to 20 were not available in his paper so they were selected from Sukati et al. (2011) and Al-Madi (2017). So, to get more accurate results I combine the questions of all these papers.

The response rate to questionnaires is shown in Table 0.2.

Table 0.2 Response Rate of Questionnaires

Number of the distributed questionnaires	120
Number of the received questionnaires	100
Rate of response	83.33%

3.10.2 Reliability Analysis

Reliability is known as the degree of a variable (or a combination of variables) that remains constant for the variable we are dealing with (Li et al., 2005). The component's consistency, which aims to measure each variable, is assessed using Cronbach's Alpha. The precise measuring coefficient assesses the objects' interdependence. In this study, the internal consistency approach is used to validate the reliability of each variable. All values of alpha are greater than 0.60, as shown in Table 0.3, and are considered acceptable (Sekaran, 2003).

Table 0.3 shows the variables, number of questions, and the value of Cronbach's Alpha and their mean.

Table 0.3 Summary of Reliability Analysis

Variables	Number of Items	Cronbach's Alpha	Mean
SPS	14	0.875	3.875
ISCM	12	0.833	3.731
CRM	20	0.912	3.962
SCP	14	0.834	3.790
OP	7	0.926	3.293
Total	67	0.876	3.79

Cronbach's alpha range is between 0 and 1, with greater values showing that the questionnaire or survey is more trustworthy.

The internal consistency of organization is interpreted by using values of Cronbach's alpha, i.e.: $0.9 \leq \alpha$ states Excellent, $0.8 \leq \alpha < 0.9$ states Good, $0.7 \leq \alpha < 0.8$ states Acceptable, $0.6 \leq \alpha < 0.7$ states Objectionable, $0.5 \leq \alpha < 0.6$ states Defective and $\alpha < 0.5$ states Unacceptable.

The first variable SPS contained 14 questions ($\alpha=.875$), ISCM consisted of 12 questions ($\alpha=.833$), CRM comprised 20 questions ($\alpha=.912$), SCP contained 14 questions ($\alpha=.834$), and the last variable OP contained 7 questions ($\alpha=.926$).

Table 0.3 shows that the highest internal consistency of 92.6% is being scored by OP whereas ISCM has the lowest internal consistency of 83.3% which are evidently more the reliability threshold of 60%. Therefore, all the variables have achieved reliability.

3.10.3 Descriptive Statistics

In my study, I proposed four independent variables which have an impact on organizational performance (dependent variable). I gather my sample data from different companies which use these practices to enhance organizational performance. I used the 5-Likert scale to explain my gathered data 1 is for strongly disagree and 5 for strongly agree.

I interpret these values based on the following ranges if the mean value ranges from 4.3 to 5 organization strongly agrees with that statement, if it is 3.5 to 4.2 it means that the organization agrees with this statement, if it ranges from 2.6 to 3.4 it means that the organization neither agrees nor disagree with the statement if the mean value is 1.9 to 2.5 that means organization disagrees with the statement and if it ranges from 1 to 1.8 then the organization strongly disagrees with the statement.

3.10.3.1 Strategic Partnership with Suppliers

The average and standard deviation are shown in Table 0.4 below for SCM in expressions of SPS application. The value is constructed on the base of the response from the respondent.

Table 0.4 Descriptive Statistics for SPS

	Factor: SPS	Mean	Standard Deviation
Q1a	We consider quality as our number one criterion in selecting suppliers	4.43	0.624
Q1b	We regularly solve problems jointly with our supplier	4.24	0.793
Q1c	We have helped our suppliers to improve their product quality	4.17	0.711
Q1d	We have continuous improvement programs that include our key suppliers	3.75	0.978
Q1e	We include our key suppliers in our planning and goal-setting activities	3.56	1.008
Q1f	We actively involve our key suppliers in new product development processes	3.62	1.033
Q1g	We consider lead time as the most important criterion in selecting our suppliers	3.83	0.726
Q1h	We consider price as the most important criterion in selecting our suppliers	3.97	0.937
Q1i	We have a formal supplier development program in our organization	3.22	1.069
Q1j	The relationship between our key suppliers and our organization is a long-term relationship	4.32	0.723
Q1k	Our suppliers keep us fully informed about issues that affect our business	3.95	0.857
Q1l	We and our suppliers exchange information that helps establishment of business planning	3.79	0.808

Q1m	We and our suppliers keep each other informed about events or changes that may affect the other partners	3.77	0.827
Q1n	Information exchange between our suppliers and us is adequate and reliable	3.64	0.759
	Total	3.876	0.847

The data collected from all the responses show the average data after the calculation is 3.876 standard deviation is 0.847. This indicates that respondents showed a very good mental attitude towards SCM about strategic partnerships with suppliers. In additional terms, respondents expressed a confident approach to SCM.

Now by looking at the Q1a in the table, the mean value is 4.43, I get to know that the organizations highly agree that they prefer quality while dealing with the supplier. Similarly for the statement Q1b, as the mean value is 4.24, organizations normally agree that they resolve their problems with their suppliers regularly and so on. Now the overall mean value of this variable is 3.876, which means that the

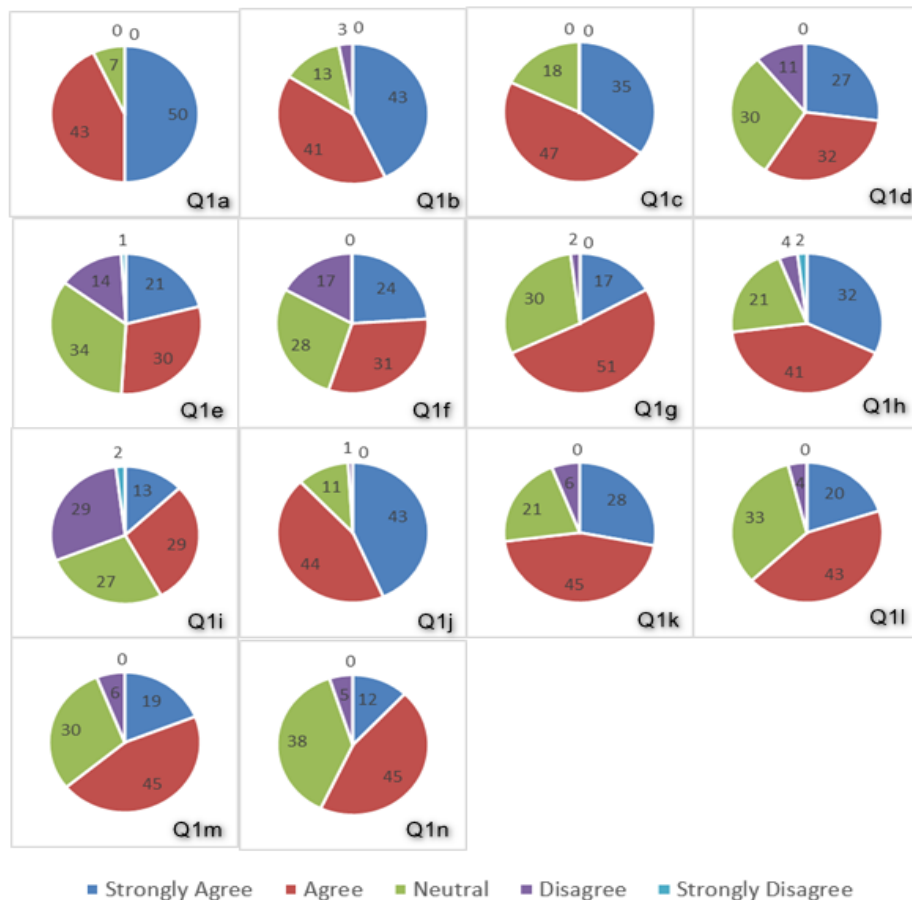


Figure 0.2 Pie-charts of Q1a-n of SPS

organizations have a good relationship with their suppliers while the overall organizations deviate from this statement by just 21.85%.

I have asked 14 questions from respondents under the statement of a strategic partnership with suppliers. Figure 3.2 shows the response rate of respondents which I have shown in the shape of a pie charts diagram.

For Q1a the pie chart shows that 50% of the organizations highly prefer quality as their top priority, 43% prefer quality at a medium level and 7% are neutral to this statement. Organizations respond toward Q1d and Q1e are almost similar which shows that organizations are very much alike while dealing with their suppliers to conduct continuous improvement programs and to involve them in planning and goal setting. And most respondents show that strategic partnership with suppliers is very important.

3.10.3.2 Internal Supply Chain Management Practices

The mean and standard deviation in ISCM appear in Table 0.5 in terms of ISCMP. The values are considered in respondents' responses.

Table 0.5 Descriptive Statistics for ISCM

	Factor: ISCMP	Mean	Standard Deviation
Q2a	In our organization, there is a joint establishment of objectives between departments	4.06	0.763
Q2b	In our organization, there are joint decisions between departments about ways to improve work	4.07	0.868
Q2c	In our organization, all departments exchange information that helps establishment of business planning	4.14	0.804
Q2d	In our organization, all departments keep each other informed about events or changes that may affect the other departments	3.92	0.837
Q2e	Information exchange between our departments is timely, accurate, and complete	3.77	0.679
Q2f	Information exchange between our departments is adequate and reliable	3.79	0.743
Q2g	We have continuous quality improvement programs that include all departments	3.97	0.858
Q2h	We have training programs for all employees	3.65	1.058
Q2i	Each employee in this organization takes the appropriate type of training program	3.65	1.019

Q2j	Our products are designed for modular assembly	3.86	0.682
Q2k	We delay final product assembly activities until customer orders have been received	3.02	1.137
Q2l	We delay final product assembly activities until the last possible position (or nearest to customers) in the supply chain	2.87	1.051
	Total	3.73	0.875

According to the statistics gathered from the responses after the calculation, the mean of the data is 3.73 and the standard deviation is 0.875. The respondents had a favorable attitude toward supply chain management when it comes to ISCM. In other words, the responders demonstrate a positive mindset toward supply chain management.

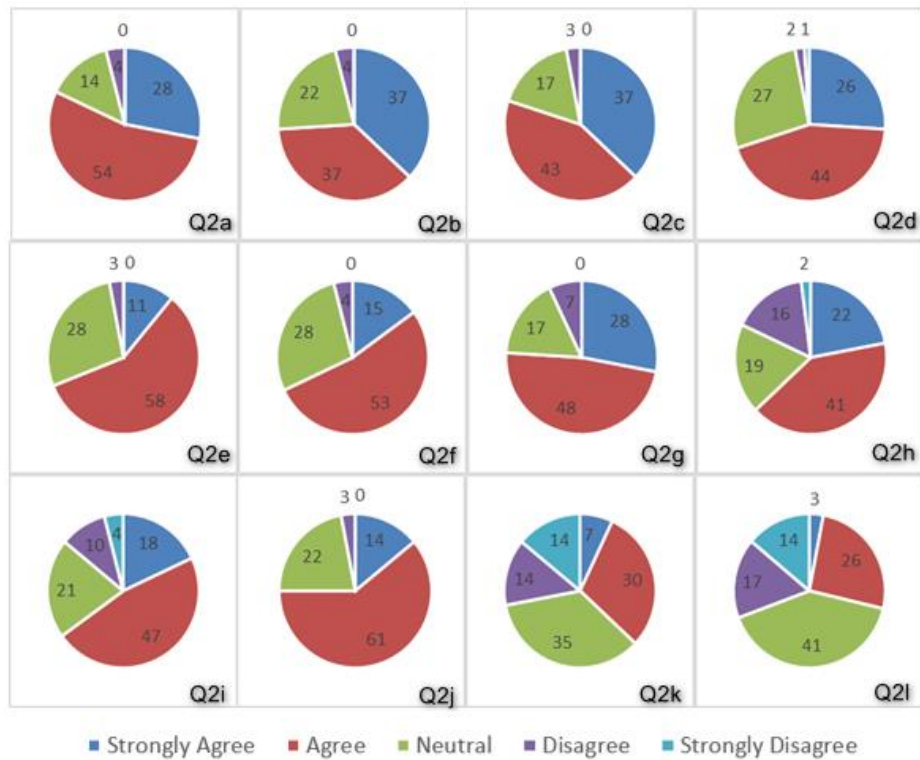


Figure 0.3 Pie-charts of Q2a-l of ISCM

Now by looking at Q2a in Table 0.5, the mean value is 4.06, I get to know organizations agree that they normally prefer the joint establishment of objectives between departments. If I talk about the Q2l, the mean value is 2.87, which means that organizations neither agree nor disagree with the statement that they postpone finished product assembly work till the very end of the supply chain and so on. The overall mean value of this variable is 3.73, which means that organizations have a good

attitude towards internal SCM practices while the overall organizations deviate from this variable by 23.45%.

I have asked 12 questions from respondents under the statement of internal SCM. Figure 0.3 shows the response rate of respondents which I have shown in the shape of a pie charts diagram.

Figure 0.3 for the Q2e pie chart shows that 58% of the organization agree that information is instantly, accurately, and completely shared between departments, 28% are neutral, 11% strongly agree, 3% disagree, and 0% strongly disagree. Similarly, for Q2l, 41% neither agree nor disagree with the statement that they postpone finished product assembly work till the very end of the supply chain, 26% agree, 17% disagree, 14% strongly disagree, and just 3% strongly agree. And most organizations agree that internal supply chain practices are important.

3.10.3.3 Customer Relationship Management

In terms of CRM techniques, Table 0.6 shows the standard deviation and mean for SCM. The values are derived from the responses of the respondents.

Table 0.6 Descriptive Statistics for CRM

	Factor: CRM Practices	Mean	Standard Deviation
Q3a	We inform trading partners in advance of changing needs	4.29	0.701
Q3b	Our trading partners share proprietary information with us.	3.66	0.997
Q3c	Our trading partners keep us fully informed about issues that affect our business.	3.91	0.767
Q3d	Our trading partners share business knowledge of core business processes with us.	3.47	1.049
Q3e	We and our trading partners exchange information that helps establishment of business planning	4.01	0.785
Q3f	We and our trading partners keep each other informed about events or changes that may affect the other partners	3.88	0.729
Q3g	We frequently interact with customers to set reliability, responsiveness, and other standards for us	4.06	0.736
Q3h	We frequently measure and evaluate customer satisfaction	4.25	0.796

Q3i	We frequently determine future customer expectations	4.36	0.785
Q3j	We facilitate customers' ability to seek assistance from us	3.89	0.898
Q3k	The relationship between our organization and our customers is a long-term relationship.	4.51	0.595
Q3l	We include our main customers in our planning and goal-setting activities	3.61	1.109
Q3m	We regularly solve problems jointly with our main customers	4.15	0.903
Q3n	We actively involve our main customers in new product development processes	3.68	0.963
Q3o	Our customers have helped us to improve our product quality	4.26	0.824
Q3p	We have a formal system to handle customer's complaints	3.95	0.903
Q3q	We inform our customers in advance about any issues that may affect their business	3.86	0.921
Q3r	We and our customers keep each other informed about events or changes that may affect the other partners	3.77	0.863
Q3s	Information exchange between our customers and us is timely, accurate, and complete	3.86	0.779
Q3t	Information exchange between our customers and us is adequate and reliable	3.81	0.775
	Total	3.96	0.844

Based on data gathered by the respondent, an average of 3.96 and a standard deviation of 0.844 were calculated. This means that in customer relationship management respondents showed a very good mental attitude toward supply chain management. In additional terms, the respondents express a constructive approach to SCM.

By looking at Q3b, the mean value is 3.66, which means that organizations agree that their trading partners share proprietary information with them. And for Q3k, the value of the mean is 4.5 which means organizations strongly agree that they maintain close contact with their clients over time. The overall mean value of this variable is 3.96, which highlights that organizations have a good relationship with their customers and overall organizations deviate from this variable by 21.31%.

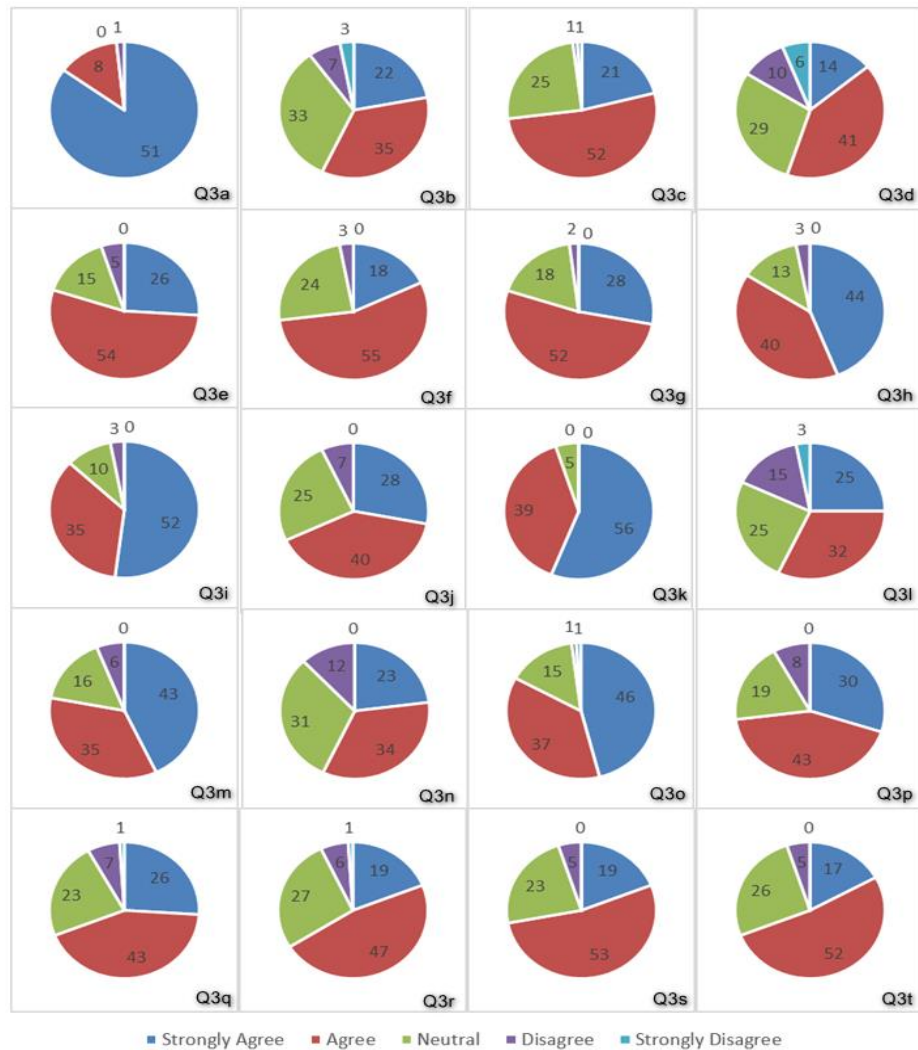


Figure 0.4 Pie-charts of Q3a-t of CRM

I have asked 20 questions from respondents under the statement of customer relationship management. Figure 0.4 shows the response rate of respondents which I have shown in the shape of a pie charts diagram.

For Q3d the pie chart shows that 41% of firms agree with the statement that their business parties exchange their business expertise with us on our primary business operations, 29% are neutral, 14% strongly agree, 10% disagree, and 6% strongly disagree. For Q3n, 34% of organizations agreed with the statement that they participate actively with their primary clients in the development of innovative products, 31% were neutral, 23% strongly agree, 12% disagree, and 0% strongly disagree. Q3s and Q3t show that organizations are showing almost the same behavior that information exchanged between our company and our clients is dependable, fast, comprehensive, and adequate.

3.10.3.4 Supply Chain Practices

In terms of supply chain performance, Table 0.7 displays the standard deviation and mean for the SCM. The values are derived from the responses of the respondents.

Table 0.7 Descriptive Statistics for SPS

	Factor: SPS	Mean	Standard Deviation
Q4a	Our organization's product development cycle time is short.	3.08	0.992
Q4b	Our organization's compliance with regulations is very good.	4.02	0.752
Q4c	Our organization's forecasting accuracy is high.	3.66	0.831
Q4d	Our organization's Supply chain response time is very good.	3.9	0.644
Q4e	Our organization's Lead-time for procurement is short.	3.65	0.796
Q4f	Our Suppliers provide reliable delivery to our organization.	4.04	0.602
Q4g	Our organization offers a wide range of products and services.	4.27	0.694
Q4h	Our organization conforms to customer specifications.	4.34	0.639
Q4i	Our organization's Capacity utilization is high.	3.96	0.852
Q4j	Our organization's Lead-time for manufacturing is short.	3.6	0.853
Q4k	Our organization has high flexibility in its Production.	3.75	0.821
Q4l	Our organization's Process cycle time is short.	3.42	0.819
Q4m	Our organization's Accuracy of scheduling is high.	3.62	0.708
Q4n	Our organization provides dependable delivery.	3.75	0.77
	Total	3.79	0.769

The mean of the data after the calculations is 3.79, based on data obtained from respondents and the standard deviation is 0.769. This indicates that respondents have a positive outlook on SCM.

By looking at Q4f, the mean value is 4.04, which means organizations agree that their organization can rely on their suppliers for delivery, and for Q4l, it means organizations neither agree nor disagree that our organization's process cycle time is short. The overall mean value for this variable is 3.79 and it means organizations are agreeing with SCM practices. And overall organizations deviate from this variable by 20.29%.

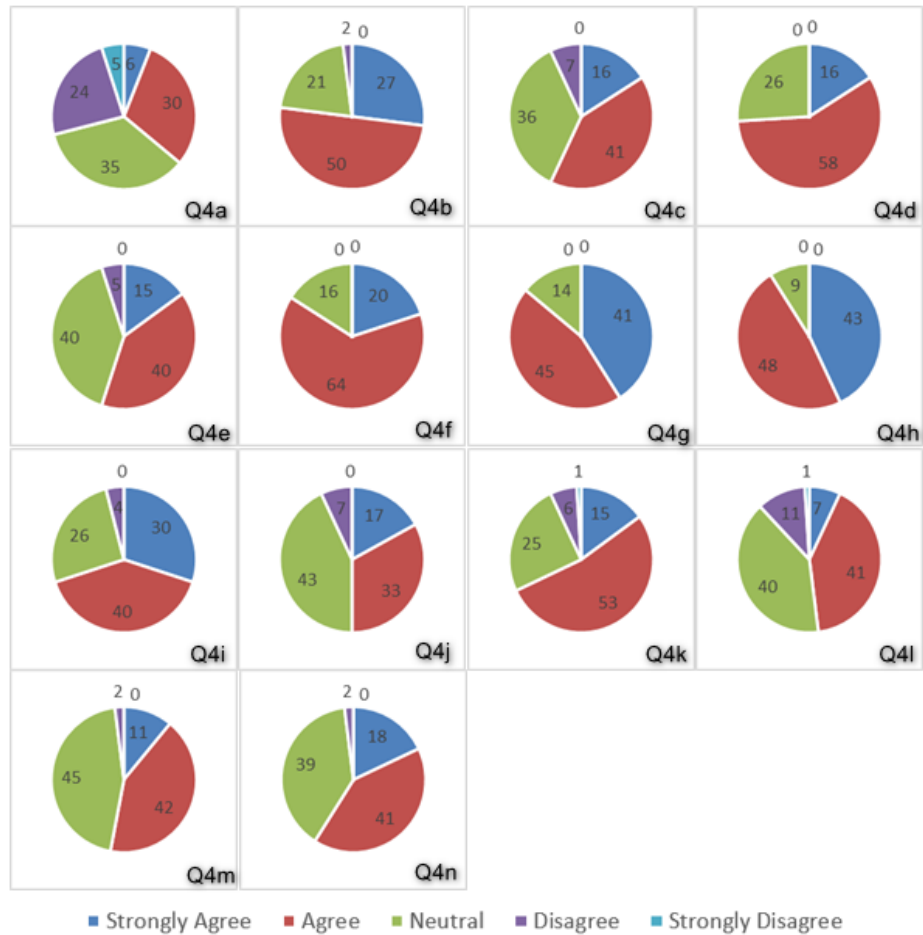


Figure 0.5 Pie-charts of Q4a-n of SPS

I have asked 14 questions from respondents under the statement of supply chain practices. Figure 0.5 shows the response rate of respondents which I have shown in the shape of a pie charts diagram.

The pie chart of Q4e shows that 40% of organizations agree and 40% are neutral with the statement that the procurement lead time for their company is minimal., 15% agree, 5% disagree, and 0% strongly disagree. For Q4j, the pie chart results show that 33% of organizations agree with the statement that the manufacturing lead time at their company is minimal, as 43% are neutral, 17% are strongly agreed, 7% disagree, and 0% strongly disagree. Q4g and Q4h pie charts results are almost the same which depicts that organizations are showing the same behavior towards supply chain practices. So, most organizations agree that internal supply chain practices are important.

3.10.3.5 Organization Performance

Table 0.8 displays the mean and standard deviation for organization performance.

Table 0.8 Descriptive Statistics for OP

	Factor: OP	Mean	Standard Deviation
Q5a	Our organization has increased its market share as compared to competitors	3.34	0.945
Q5b	Our organization has increased its return on investment as compared to competitors	3.19	0.918
Q5c	Our organization has increased its market share growth as compared to competitors	3.25	0.925
Q5d	Our organization has increased its sales growth as compared to competitors	3.44	0.978
Q5e	Our organization has increased its growth in return on investment as compared to competitors	3.21	0.88
Q5f	Our organization has increased its profit margin on sales as compared to competitors	3.16	0.884
Q5g	Our organization has increased its overall competitive position in the market.	3.46	0.915
	Total	3.29	0.921

From the data collected it is depicted that the mean is 3.29 and the standard deviation 0.921 which shows the positive attitude of respondents towards OP.

If we look at Q5b, the mean value is 3.34, which means that organizations agree that as compared to their competitors, the firm has improved its return on investment, and for Q5d, the mean value is 3.4, which means organizations neither agree nor disagree that our organization has increased its sales growth as compared to competitors. So, the overall mean value of this factor is 3.29 which indicates that organizations neither agree nor disagree with this factor. Overall organizations deviate 27.99% by this variable.

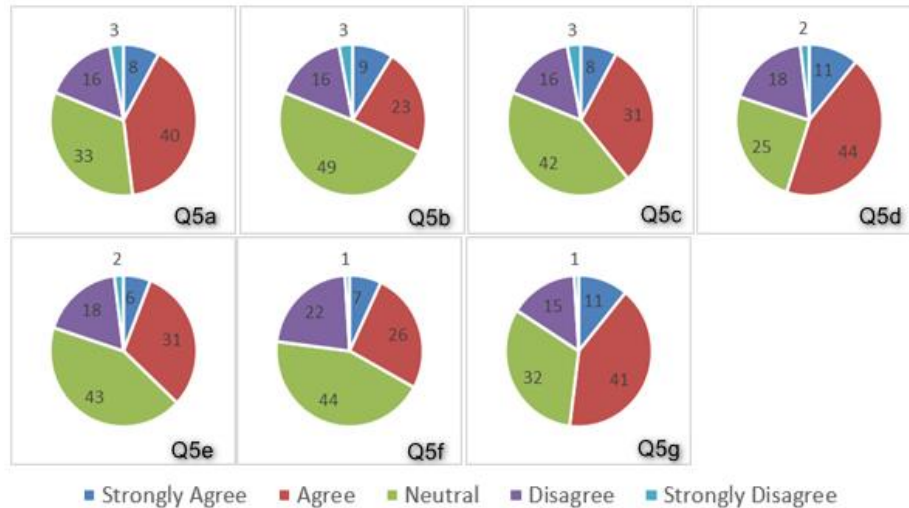


Figure 0.6 Pie-charts of Q5a-n of OP

I have asked 07 questions from respondents under the statement of organization performance. Figure 0.6 shows the response rate of respondents which I have shown in the shape of a pie charts diagram.

The pie chart of Q5g shows that 41% of organizations agree that our organization has increased its overall competitive position in the market, 32% are neutral, 15% disagree, 11% strongly agree, and 1% strongly disagree. For Q5d, the pie chart result shows that 44% of organizations agree that our organization has increased its sales growth as compared to competitors, 25% are neutral, 18% disagree, 11% strongly agree, and 2% strongly disagree. So, most organizations have shown neutral behavior towards this variable.

To sum up, all variables' responses are more than 3 Likert scale which indicates that these variables have a substantial impact on OP and companies consider these variables to enhance their overall performance.

When comparing the mean values of each variable with previous literature where I have extracted questions the results show that the mean values of each variable like SPS (3.876), CRM (3.96), ISCP (3.73), SCMPs (3.79), and OP have a value of (3.29) which shows that the respondents have a positive attitude towards these practices and these results are most likely correlated with previous literature.

3.10.4 Correlation Analysis

3.10.4.1 Correlation Analysis amongst OP and SCM practices

The connection between organizational success and SCM practices is represented in Table 0.9. All correlation data is relevant, according to data received from respondents and Pearson correlation analyses. As a result, though I only use relationship analysis to assess the reliability of the relations between various variables, I will conclude that SPS, CRM, ISCM, and SCP are all completely and strongly linked to Organizational Performance.

Table 0.9 Relationship between SCM and Supply Chain Performance

Pearson Correlation	SPS	ISCM	CRM	SCP	OP
SPS	1				
ISCM	.621**	1			
CRM	.782**	.626**	1		
SCP	.699**	.552**	.743**	1	
OP	.594**	.390**	.560**	.584**	1

Correlation analysis shows the linear relationship among proposed variables and explained how much strengthens that relationship between two variables. In my study, I present four independent variables which showed a strong impact on organization performance.

Applying correlation analysis to my presented data I find out a very interesting result that defends my proposed statement. SPS-OP has a correlation value of .594 which indicates that SPS has a positive but medium relationship with organization performance.

ISCM-OP has a value of .390 which indicates that ISCM shows a positive but weak relationship with organizational performance. It shows companies do not work

on this variable more than others because it has positive relation but very little impact on organization performance according to given data.

CRM-OP has a value of .560 which indicates that CRM has positive but medium relation with organizational performance. At very last SCP-OP has a value of .585 which indicates positive but medium relation with organizational performance.

When compared with the results from Al-Madi (2017), the correlation values of organization performance with SPS, CRM, ISCM, and SCP are all positive, this indicates that the organization performance is positively correlated with these independent variables, as in the literature. My correlation value of SPS with OP is 0.954 while Al-Madi (2017) has a value of 0.467. For ISCM I have a correlation value of 0.390 rather than the value of 0.803 in the literature. My experiments yielded a CRM correlation value of 0.560 while Al-Madi (2017) has a value of 0.756. Finally, my SCP correlation value was 0.584 as compared to the value of 0.648 in the literature. The only difference is the positive but weak relationship of ISCM with OP which is a result of a delay from the organization in the delivery time of the product to the customer due to unspecified reasons.

All my proposed variables have a medium substantial impact on organizational performance except ISCM which shows a small substantial impact on organizational performance. When comparing the supply chain performance of the fan manufacturing industry with other industries which have considered the same variables correlation results of SPS, ISCM, CRM, and SCP have almost the same values. These values describe that all the variables have a most likely positive correlation with previous literature.

3.10.5 Simple Linear Regression

3.10.5.1 Strategic Partnership with Suppliers

After running the simple regressions, the following results are obtained. In the result tables, the R-value, also known as the simple correlation coefficient, is represented in column "R." In this case, R is the size of the predictive quality of the dependent variable, OP. In this scenario, the 0.594 value indicates a reasonable prediction rate. The R^2 value (also called "determinant coefficient") is a variable ratio that shows how well the model predicts the outcome. The closer the value is to 1, the

better the prediction. The value of .353 indicates that the independent variables accounted for 35.3 percent of the variance in the dependent variable, and factors other than the model's predictions were responsible for 64.7 percent of the changes. Adjusted R^2 is another important metric to report when interpreting results. The value of 0.346 shows that 34.6 percent of the variation in the dependent variable is explained by the predictors in the model, and the remaining 65.4 percent is unexplained. This means that there are other factors affecting the dependent variable that were not included in the model. Error Fit Standard .61 Models is the size of the model's accuracy. The residual standard deviation is the term for this. It demonstrates how unreliable a regression model can be when it is used to predict or evaluate dependent variable or variable of interest. The standard error decreases as R^2 increases. Given that all components in predicting OP were not incorporated in this model, estimations of OP with this model will be off by .61 on average, which is a negligible amount. And thus, the standard error is satisfactory.

The F-ratio (

Figure 0.7) in ANOVA is used to see if the aggregate regression model is acceptable for the data.

Figure 0.7 indicates that independent variables expect the dependent variable, $F(1, 98) = 53.37, p (.000) < .05$. (i.e., the regression model fits well for the data). Remember this; the value-t and the appropriate p-value are in "Sig" and "t". Column (

Figure 0.7) each, in this example, the test tells us that SPS $P (.000) < 0.05$ is significant.

In

Figure 0.7, the 0.594 value indicates a reasonable prediction rate. The dependent variable's variation was explained by the independent variables in 35.3 percent of cases, according to the value of 0.353, while 64 percent of changes were attributable to variables other than the model's predictions.

The value of 0.346 shows that 34.6 percent of the variation in the dependent variable is explained by the predictors in the model, and the remaining 65.4 percent is unexplained. This means that there are other factors affecting the dependent variable that was not included in the model. Error Fit Standard .61 model is the size of the model's accuracy. Given that all components in predicting OP were not incorporated in this model, estimations of OP with this model will be off by .61 on average, which is a negligible amount. And thus, the standard error is satisfactory.

ANOVA is used to see if the aggregate regression model is acceptable for the data.

Figure 0.7 indicates that independent variables expect the dependent variable in the regression model fits well for the data.

Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.594a	.353	.346	.61994		
a. Predictors: (Constant), SPS						
ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	20.514	1	20.514	53.377	.000b
	Residual	37.664	98	.384		
	Total	58.179	99			
a. Dependent Variable: OP						
b. Predictors: (Constant), SPS						
Coefficients ^a						
		B	Std. Error	Beta	t	sig
1	(Constant)	-.043	.461		-0.094	.926
	SPS	.861	.118	.594	7.306	.000
a. Dependent Variable: OP						

Figure 0.7 Simple linear regression result of SPS

3.10.5.2 Internal Supply Chain Management

Under this scenario, the 0.390 score indicates a pretty good prediction rate. The independent variable, which has a value of 0.153, explains 15.3 % variability in organizational performance, and other factors that are not included in the model contributed to a variation of 84.7%. In this study, the value of 0.152 showed that 15.2% of the variables were significant. The expected performance of organizations with this model is on average 0.71, which is a substantial amount. The standard deviation is also bad.

Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.390a	.152	.143	.70953		
a. Predictors: (Constant), ISCM						
ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.842	1	8.842	17.564	.000b
	Residual	49.337	98	.503		
	Total	58.179	99			
a. Dependent Variable: OP						
b. Predictors: (Constant), ISCM						
Coefficients ^a						
		B	Std. Error	Beta	t	sig
1	(Constant)	1.175	.510		2.301	.023
	ISCM	.568	.135	.390	4.191	.000
a. Dependent Variable: OP						

Figure 0.8 Simple linear regression of results of ISCM

The independent variable in statistical terms predicts the dependent variable (i.e., the regression model fits well for the data). The test tells us that ISCM $p (.000) < 0.05$ is significant in this scenario.

3.10.5.3 Customer Relationship Management

The 0.560 result suggests strong prediction accuracy in this scenario. The dependent variable is 31.4% of the organizational performance variability, and the independent variable has a value of 0.314. In Figure 0.9 the value of 0.307 indicates that the change in expected results variables is 30.7%. Standard Error Fit.63 is the model's accuracy measured in model size. On average, this model's assessment of organizational performance will be incorrect up to 0.63, because it does not include all the characteristics used to determine the performance of the organization in this model, and hence can be overlooked. And standard errors can be accepted.

ANOVA values determine that the total model is ideal for the data. Figure 0.9 reveals that the dependent variable is predicted by the independent variable predicted in statistical terms and the regression model fits well for the data.

Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.560a	.314	.307	.63817		
a. Predictors: (Constant), CRM						
ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	18.267	1	18.267	44.855	.000b
	Residual	39.911	98	.407		
	Total	58.179	99			
a. Dependent Variable: OP						
b. Predictors: (Constant), CRM						
Coefficients ^a						
		B	Std. Error	Beta	t	sig
1	(Constant)	.032	.491		0.066	.947
	CRM	.823	.123	.560	6.697	.000
a. Dependent Variable: OP						

Figure 0.9 Simple linear regression results of CRM

In this example, the text tells us that CRM $p (.000) < 0.05$ is significant in predicting OP.

3.10.5.4 Supply Chain Practices

In this situation, the .584 value indicates a decent prediction rate. A higher number indicates a stronger relationship between the two variables. The independent variable, in this case, had an influence of 34.2% on the dependent variable, which means that the independent variable explains 34.2% of its variance. Factors other than the model's projection were responsible for 65.7%. The anticipated organizational performance using this model will be 0.62 off on average, which does not incorporate

all the parameters utilized to predict organizational success in this model. And standard errors can be accepted.

ANOVA determines whether the model is appropriate for the data or not. The independent variable significantly predicts a dependent variable, as seen in

Figure 0.10.

Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.584a	.342	.335	.62518		
a. Predictors: (Constant), SCP						
ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	19.875	1	19.875	50.851	.000b
	Residual	38.303	98	.391		
	Total	58.179	99			
a. Dependent Variable: OP						
b. Predictors: (Constant), SCP						
Coefficients ^a						
		B	Std. Error	Beta	t	sig
1	(Constant)	-.593	.549		-1.081	.282
	SCP	1.025	.144	.584	7.131	.000
a. Dependent Variable: OP						

Figure 0.10 Simple linear regression results of SCMPs

Let's now conduct a multiple regression analysis to examine the relationship between these variables and discover how each independent variable affects the dependent variable in a combined form.

3.10.6 Multiple Regression Analysis

To examine the combined impact of independent variables on the dependent variable, I ran a multiple regression analysis. Multiple regression analysis is done using

5 variables, i.e.: SPS, CRM, ISCM, SCP, and OP. Where OP is the dependent variable and SPS, CRM, ISCM, and SCP are independent variables.

After running the multiple regression, the following results are obtained. A high level of prediction is indicated by a value of 0.643. Adjusted R^2 is calculated by subtracting the constant term from the R^2 value. If the constant term is not subtracted, then the R^2 value will always be 100%. Therefore, if we were to calculate the adjusted R^2 for the model above, it would be 0.413. This means that 41.3% of the variation in OP is due to the independent variables included in the model. However, the independent variables are unable to account for 58.7% of the variation in the dependent variable. An adjusted R^2 of 0.38 in this study indicates that the independent variables can account for 38 percent of the variation in the dependent variable. The model fit's standard error of 0.59 is a way of measuring the model's precision. Estimates of OP using this model will be off by 0.59 on average, which is a minor error given that not all factors in predicting OP were used in this model. As a result, the standard error is tolerable.

To determine whether the aggregate regression model is appropriate for the data the F in ANOVA ratio is used as shown in Figure 0.11. Statistically, the independent variable's prediction of the dependent variable is shown in Figure 0.11, $F(3, 8) = 16.718$, $p(0.000) < 0.05$. (i.e., the data fits well with the regression models).

Remember this, the value-t and the appropriate p-value are in the "sig" and "t" columns (Figure 0.11). The example shows that the test shows us that SPS $p(0.018) < 0.05$ and SCP $p(0.017) < 0.05$ are important while ISCM and CRM are not as significant. These variables may be insignificant because the sample size is too small or the random variation is too large to detect a clear significant effect even if there is an effect, or because they are associated with other variables and the data cannot be known how much of the effect of the respective variables are related to the individual variables. Insignificance only means that the data do not provide evidence of an effect, but it does not mean that such an effect cannot exist.

As discussed above the standard error in the fit model, the standard error of the coefficient in regression output anticipated as minimum as possible. This shows how incorrectly one can estimate the value. For example, in this case, relative to a coefficient of 0.196 of SPS its standard error of 0.196 is minor.

This general form of the equation is used to forecast organizational performance based on SPS, CRM, ISCM, and SCP. Whereas to determine data points, a 5-point

Likert scale is used as a measurement scale, which is an average of survey scores. I averaged the scores for each factor to obtain the data points for the regression.

$$Performance = \alpha + \beta_1 * SPS + \beta_2 * ISCM + \beta_3 * CRM + \beta_4 * SCM$$

$$OP = -0.923 + 0.473(SPS) - 0.072(ISCM) + 0.168(CRM) + 0.524(SCP)$$

Intercept 0.923 is a predicted value for the performance of the organization of the dependent variable if all independent variables, SPS = 0, CRM = 0, ISCM = 0, and SCP = 0. Explicitly, I will expect on average - 0.923 OP when all predictive variables take a value of 0.

An unstandardized coefficient is used to display the variation between the dependent and independent variables while all other independent variables are kept constant. For the addition of units to independent variables, the regression coefficient predicts changes in the performance of the dependent variable organization. SPS has a reference coefficient of 0.473 above the non-standard coefficient (Figure 0.11). This means that for every increment in SPS, OP increases by 0.367. CRM has an unstandardized coefficient of 0.168. This means that there is a 0.168 increase in the OP for every unit increase in CRM. The unstandardized coefficient for SCP is 0.524. This means there is a 0.524 rise in the OP for every unit rise in SCP. But OP is reduced by 0.072 for each one-unit rise in ISCM (the adverse sign of the coefficient).

Standard coefficients, which are listed in the "Beta" column, are referred to as "beta weights" in this context. When the predictive variable is multiplied by the standard deviation and all other model variables are maintained constant, the beta weight predicts how much the variable value will increase (in standard deviation). These are the steps for classifying predictive variables depending on their collaboration in the results variable description (regardless of symbols). So, in this case, SPS is the most collaborative predictor (.326) to define the OP, and the next SCP is (.299). It means that this is true only if the model is completely determined and there is no multidimensionality between predictors.

Model Summary								
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate				
1	.643 ^a	.413	.388	.59951				
a. Predictors: (Constant), SCP, ISCM, SPS, CRM								
ANOVA ^a								
Model		Sum of Squares	df	Mean Square	F	Sig.		
1	Regression	24.035	4	6.009	16.718	.000 ^b		
	Residual	34.144	95	.359				
	Total	58.179	99					
a. Dependent Variable: OP								
b. Predictors: (Constant), SCP, ISCM, SPS, CRM								
Coefficients ^a								
		B	Std. Error	Beta	t	sig.	Lower Bound	Upper Bound
1	(Constant)	-.923	.554		-1.666	.099	-2.023	.177
	SPS	.473	.196	.326	2.414	.018	.084	.862
	ISCM	-.072	.153	-.049	-.467	.641	-.376	.233
	CRM	.168	.211	.114	.793	.430	-.252	.587
	SCP	.524	.216	.299	2.426	.017	.095	.952
a. Dependent Variable: OP								

Figure 0.11 Multiple regression results

To test my hypothesis, I repeat the regression analysis without the variables (ISCM and CRM), and the result is nearly identical to that presented in Figure 0.12. The second regression's f-test statistics (F 33.52) are higher than the first regression's, allowing me to fit the entire model with greater ease. With a p-value of $0.000 < 0.05$, the model is likewise significant.

Model Summary								
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate				
1	.639 ^a	.409	.397	.59553				
a. Predictors: (Constant), SCP, SPS								
ANOVA ^a								
Model		Sum of Squares	df	Mean Square	F	Sig.		
1	Regression	23.777	2	11.889	33.522	.000 ^b		
	Residual	34.401	97	.355				
	Total	58.179	99					
a. Dependent Variable: OP								
b. Predictors: (Constant), SCP, SPS								
Coefficients ^a								
		B	Std. Error	Beta	t	sig.	Lower Bound	Upper Bound
1	(Constant)	-.944	.533		-1.771	.080	-2.002	.114
	SPS	.525	.158	.362	3.317	.001	.211	.839
	SCP	.581	.192	.331	3.033	.003	.201	.961
a. Dependent Variable: OP								

Figure 0.12 Multiple regression results without CRM and ISCM

In multiple regression analysis, the beta value of CRM is .168 and in simple linear regression analysis, it is .823. So, the difference between the beta value of CRM shows that when multiple regression analysis is run lower value of CRM has less importance than other variables which have higher values. In the presence of all variables, this variable has less significance on the dependent variable (organization performance) than other variables which have high significance. However, when a simple linear regression analysis is run the beta value of CRM is higher than the previous one. This shows that here in simple linear regression other variables are not present and do not affect the importance of this variable. So, in simple linear regression, each independent variable is interacting individually with the dependent variable whereas in multiple regression independent variables interact collectively with the dependent variable. Also in simple regression, we check if there is a relationship between independent and dependent variables, but in multiple regression, we test the strength of that relationship when all other relationships are considered.

In multiple regression, a variable dependent on independent variables, a beta is a partial correlation coefficient that measures the correlation between any two variables (dependent variable and regressor) when the second regressor, for example, the second independent variable, is kept constant. This means that when we have removed the influence of the second independent variable on the first independent variable and removed the influence of the second independent variable on the dependent variable. Then the beta of the first independent variable is a partial relational number (since this beta is the effect of the first independent variable on the rest of the dependent variable). Therefore, in multiple regressions, the beta is likely to differ from the beta in a simple regression of only the first independent variable.

When compared with Al-Madi (2017) their mean values of SPS, ISCM, CRM and SCP are 4.00, 4.44, 4.02 and 3.975, respectively, where I got 3.88, 3.73, 3.96 and 3.79. From analyzing these values, I can say that mean of my data is very much like already done research which means our input is closely related to their input. When I compared my Cronbach's alpha values for SPS, ISCM, CRM and SCP which are 0.875, 0.833, 0.912 and 0.834, respectively, with Nawaz (2020) i.e.: 0.560, 0.691, 0.867 and 0.682, respectively, there were minor differences like the they had lower Cronbach's alpha values, probably because of the difference in the sample size and variation in input.

According to Al-Madi (2017), the correlation value between SCP and ISCM is 0.575 which is very similar to what I got i.e.: 0.552. They got a correlation value of 0.585 between SCP and CRM which is a little lower than mine i.e.: 0.743. They had a correlation of 0.467 between SCP and SPS which is lower than what I have i.e.: 0.699. They had a correlation of 0.767 between ISCM and CRM which is higher than what I have i.e.: 0.626. They had a correlation of 0.759 between CRM and SPS which is similar to what I have i.e.: 0.782. My correlation values are almost the same as of Al-Madi (2017).

After running a multiple regression analysis of my collected data, I determined that my SPS beta value of 0.473 is greater than that of Nawaz (2017) in which the SPS beta value was 0.305. My remaining findings also differ from the findings of Nawaz (2017); ISCM yielded values of -0.072 and 0.183 respectively, CRM yielded beta values of 0.168 and 0.482 respectively, and SCP yielded beta values of 0.524 and 0.230 respectively. It is concluded that my ISCM value is insignificant while compared to that in Nawaz (2017), and that my CRM value is lower, and my SCP value is greater.

The difference between these values might be because of that the Nawaz (2017) research was on the textile industry and this industry consists of structured organizations and supply chain of textile industry is different than fan industry.

CHAPTER 4

4.RESULTS AND CONCLUSIONS

4.1 Results and Conclusion

After gathering the necessary information, I was able to analyze the following outcomes: From SPS, CRM, ISCM, and SCP, a multiple regression was done to predict OP. Organizational Performance was statistically significantly predicted by the model $F = 16.718$.

Out of four just two factors SPS and SCP added statistically to the prediction. The most noteworthy participating indicator is SPS, and the second one is SCP to clarify Organizational Performance.

So according to the data analyzed H1 and H4 were accepted and H2 and H3 were rejected.

H1: SPS improves OP of Fan manufacturing SMEs in Pakistan.

This hypothesis tests whether SPS positively affects the OP of Fan Manufacturing SMEs in Pakistan or not. The dependent variable OP was regressed on predicting variable SPS to test hypothesis H1. For SPS t value is greater than 1.96 which means SPS has a constructive impact on OP, and it plays a considerable role in predicting OP. Also, this impact is not significant as the value of the $p < 0.05$. So, H1 is accepted.

H2: ISCM positively affects the OP of Fan Manufacturing SMEs in Pakistan.

This hypothesis tests whether ISCM positively affects the OP of Fan Manufacturing SMEs in Pakistan or not. The dependent variable OP was regressed on predicting variable ISCM to test hypothesis H2. For ISCM t value is not greater than 1.96 which means ISCM hurts OP, and it does not play a significant role in

predicting OP. Also, this impact is not significant as the value of $p > 0.05$. So H2 is rejected.

H3: CRM improves the OP of Fan manufacturing SMEs in Pakistan.

This hypothesis tests whether CRM positively affects the OP of Fan Manufacturing SMEs in Pakistan or not. The dependent variable OP was regressed on predicting variable CRM to test hypothesis H2. For CRM t is not greater than 1.96 which means CRM does not affect OP and it does not play a significant role in predicting OP. Also, this impact is not significant as the value of $p > 0.05$. So H3 is rejected.

H4: SCMPs have a positive effect on the OP of Fan manufacturing SMEs in Pakistan.

This hypothesis tests whether SCMPs positively affect the OP of Fan Manufacturing SMEs in Pakistan or not. The dependent variable OP was regressed on predicting variable SCM to test hypothesis H1. For the SCMPs t value is greater than 1.96 and that implies SPS positively affects OP, and it plays a considerable role in predicting OP. Also, this impact is significant as the value of $p < 0.05$. So H4 is accepted.

4.2 Discussion

Statistical analysis was conducted to analyze the results. The result of the analysis of the data shows that the strategic partnership with the supplier was positively and significantly affecting OP. This outcome was attained because both parties had a single objective of having a solid collaboration of the supply chain with its suppliers. This conclusion was confirmed in previous studies by (Dolo, Magutu, & Mogikoyo, 2018). It was found that the participants of the study positively impacted supplier partnerships and enhanced their organizational capacity. It can also be said that suppliers and manufacturers were moving in the same direction with the mutual arrangement of tasks that helped them to develop their products within time which ultimately enhanced their organizational performance.

Moreover, results for ISCM and CRM are somewhat contradictory to the literature. In previous research by Al-Madi (2017), ISCM and CRM had a positive effect on OP, however, in this research ISCM and CRM are not playing a positive role in predicting OP. Although the regression study does not support the association between these variables, the correlation analysis demonstrates a favorable correlation

between these variables and supply chain performance. It might be that ISCP and CRM are not important factors overall because the supply chain practices of the fan industry are different than any other industry. As I mentioned in the introduction fan manufacturing SMEs are mostly family-owned businesses, some organizations are well organized and structured but most of them do not have a proper department to run different functions of the organization and one employee or owner himself is performing such different duties of the firm.

By analyzing the results this study indicates that supply chain practices were positively and significantly affecting organization performance. And this result was supported in a previous study by Al-Madi (2017). It shows that the improvement in supply chain practices greatly affects the OP. Overall, this study has provided a theoretical SCMPs framework that clarifies the role of SCMPs, SPS, ISCM, CRM, and supply chain practices in the field of SCM. This study provides practical and useful audit tools for supply chain managers in estimating the SCM methods and the results suggest that better use of SCMPs can lead to better supply chain results.

4.3 Limitations

This study investigates the impacts of SCMPs relating to the OP of Pakistani fan manufacturing SMEs. The scope of this research was broad, data collecting was challenging due to limited resources and time constraints, and only 100 fan companies were contacted for responses. This is the first analysis of the Pakistani fan manufacturing business. To see a more significant impact on this subject, future studies should separate the manufacturing fan business into smaller, medium, and large-sized organizations. Due to the study's scope, not all elements and factors can be covered in one study. Additional supply chain strategies can improve results, but time constraints limit this development. To cover the complete spectrum of supply chains, future academics must broaden their research with SCM approaches such as product creation and commercialization, manufacturing flow management, and logistics management.

4.4 Conclusion

The main goal of this study is to assess the effects of SCMPs on the performance of the organization from the perspective of the fan manufacturing industry in Pakistan

(Gujranwala and Gujarat). There are various variables through which this relationship is assessed. These included SPS, ISCP, CRM, and SCMPs which helped measure organizational performance and conducted multiple regression analyses to measure these variables. While two hypotheses (SPS and SCM Methods) are accepted, two hypotheses (CRM and ISCM) are rejected.

However, there is a great deal of room for future expansion and profitability in the Pakistani fan manufacturing industry. Senior managers and executives should maximize their potential. Successful aspects such as strategic alliances in Pakistani surroundings must be increased under the government's auspices to strengthen the Pakistani fan manufacturing business. The industry's interest and cooperation are critical to the success of future research. Senior executives' desire to modify supply chain procedures and use these techniques to improve their OP is a requirement for positive change.

4.5 Recommendations

This study is very important in the aspect of SCM, and it helps to provide very vital information to managers. Managers are recommended to improve OP by establishing relationships with suppliers. The organizations should work on innovation and technology in maintaining the supply chain and should promote the initial supplier involvement in the formation of business solutions. They should create and develop a shared strategy, vision, and goals that can be beneficial to both parties. To establish a smooth and successful lasting relationship between the strategic suppliers they should share every consequence and return for mutual benefit. Managers are recommended to improve their organizational performance by establishing good relations with customers. As a result, the first and most crucial advice is to develop a solid and trustworthy relationship with their clients by offering them quality service. They should conduct surveys and ask for feedback so customers can highlight their problems which will help in organizational development. Every organization should have a separate supply chain department and employees who have expertise in this field and timely information should be shared between them for significant positive results.

4.6 Future Research

This research has guidelines for future researchers studying this topic. First, a larger sample size needs to be employed in future studies because the current one was not much. Second, the current study used five SCM techniques, and future research may include more techniques using this dependent variable. Finally, researchers should also include mediator and/or moderator variables understanding the impact of SCMPs relating to the organizational performance of fan manufacturing SMEs of Pakistan. Furthermore, future researchers are directed to surge the number of observations as this will lead to a consensus on the use of the instrument.

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