

Factors Affecting Supply Chain Management Effectiveness: A Case of Textile Sector of Pakistan

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ABSTRACT

Since evolution of globalization mostly organizations have adopted those techniques of supply chain management (SCM) that change the manufacturing systems from traditional to modern ways and enhance SCM effectiveness. The intention of this study was to discover whether there is any involvement of supply chain management effectiveness in the development and expansion of textile industry of Pakistan. This study was conceded in textile firms via primary research tool called pre-tested questionnaire consisting of five-point likert scale and non probability sampling technique was used to record responses. The study used statistical package for social sciences (SPSS) for analysis of data and findings. Chronbach's alpha, descriptive statistics, regression analysis and correlation was implied. Findings reveal that all the four dimensions are crucial to increase the effectiveness of supply chain management. Planning and on-time delivery factors are more associated with SCM. Scatter plot matrix showed positive relationship among variables. With the help of these results organizations can use best approaches to improve their SCM strategies but confined number of firms and sample size build limitations on generalizability of the findings.

KEY WORDS: Supply chain management, Sourcing, Time delivery, Quality.

Paper Type: Research Paper

1. INTRODUCTION

In this era of technology and communication, organizations are using effectual techniques to boost up their business strategies. Supply chain management (SCM) is comprised of the arrangement of interrelated business activities implicated in the stipulation of product or services that are mandatory for the ending patrons in supply chain actions [1]. It involves all activities from purchasing of raw material to work in process procedures till finished products that are used by the end consumers. SCM is a collection of interrelated participating organizations which add worth to a stream of distorted inputs from their starting place of derivation to the finish goods or services that are required by the nominated end-clients [2]. Supply chain is basically a chain of unified processes supportive for providing value, information as well as material flows within and among organizations [3,4]. It is the "philosophy of management" starting from the step of supplier's provisions and goes downwards to the stream of end users [5]. SCM has strong affiliation with operational competences of organizations' ability to reduce cost, deliver promises, logistic services and designing of the product [6]. By applying supply chain Integration, a company can gain the priorities of the customers, as well as competitive edge as compared to competitors, and, preferences of the suppliers as well [7].

Textile is one of the oldest industries in industrial development. Now a day's Textile and fashion industry is growing in Pakistan due to increasing trends of fashion and clothing. It enhances the exports of Pakistan and contributes in economic development[8]. To gain competitive advantage companies must look for latest solutions to improve their supply chain by using different techniques of planning, outsourcing and distribution networks. It enhances an organization's profitability, market share and customer satisfaction as well[9]. Delivery of the garments from textile factory depends on effectiveness of supply chain management because it reduces the cost and lead time to provide

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the quality products to the end customers. SCM is an emerging trend in Pakistani textile firms [10]. So, the purpose of this study is to examine the crucial factors enhancing effectiveness of supply chain management in the Textile Industry of Pakistan.

2. Objective of Study

The aims of the current study are:

- To discover the effect of factors of planning, sourcing, quality and time delivery on SCM effectiveness in textile industry in Pakistan
- To investigate the relative strength of variables.
- To give guidelines to practitioners and marketers in order to redesign their strategies related to supply chain efficiency.
- To add contribution in existing knowledge, so future studies can explore the other important factors affecting on SCM.

3. LITERATURE REVIEW

3.1 Background of Supply Chain Management (SCM)

Recently the top companies are discovering new sources of gaining competitive edge and best performance by taping the concepts of SCM [11, 12]. Oliver and Webber firstly used the term of Supply Chain Management in 1982 in an article focusing on the variety of activities performed by different organizations in their procuring and supplier selection processes [13]. Early study showed that supply chain mainly focused on purchasing and cost efficient systems [14]. But, the concepts of buyer-supplier and supply chain integration were published in 1990s. Due to globalization, development of advance technologies, new trend of customers and sever competition; supply chain has become very popular and is being used in real life activities [15]. A successful business entity is not only dependent on management's inward ability but more practical and assured way is to integrate with supply chain collaboration, integration, adequate structural configuration and strategic positioning [2].

3.2 Related Theories and Studies

There are some theories regarding supply chain management like resource base theory (RBV) that describes the basis of competitive advantage and provides value to tangible and intangible resources of the firm. In order to transform short run competitive advantage into sustainable advantage, these resources should be heterogeneous in nature and these valuable resources could neither be imitable nor substitutable by competitors [16]. Material requirement planning theory (MRP) is based on planning of production and inventory control systems used in manufacturing processes [1]. Such systems ensure that the material is available for production or not, and whether products are available for customers or not. Joseph Orlicky developed MRP for Toyota Company in 1983 and Oliver Wigh modified it as a manufacturing resource based planning. Hopp and Spearman's Channel Coordination Theory (supply chain coordination) states the objectives and plans to enhance performance of an individual organization [17].

Extensive work has been done on SCM in various contexts across different sectors because of its vital role in firm's performance so no organization can ignore this area of interest. Few researches have found that in Germany Purchasing and Supply Chain Management (PSCM) is very important for senior management and in any organization with respect to the operational presentation and afterward effect on monetary performance. A Study involving 306 companies related to eight different sectors concluded that PSM drivers create improvements in financial outcome through mediating factors of quality, cost and innovation performance [18].

Chinho and Chun conducted a study in which five factors i.e. training, top management and quality strategy, product/service intend, quality information coverage and customer direction were taken as exogenous independent variables and firm performance as endogenous dependent factor [19]. SEM results revealed that QM practices are very important for supplier collaboration and integration and also provide quality products to the customer that ultimately affects the organization performance. It has been depicted the positive effect of Automatic Identification on Supply Chain strategies like receiving, transportation, in-facility operations and distribution, and, concluded that new technologies are helpful in managing supply chain work efficiently as well as reduced cost and wastes [20].

It was argued that the general purpose of the management accounting is to support decision making and coordinating the activities of supply chain performance [21]. Results showed that accounting techniques like kaizan costing, activity based costing value cost analysis (VCA) could be used to enhance the supply chain efficiency. It has been identified the supply chain problems related to Pakistani enterprises and conducted study on electrical

appliances and vehical companies [14].Findings showed that SCM has a huge impact on customer satisfaction level, minimizes lead time and improves customer relations. It has been found that flow of information, organizational factors, management commitment, understanding of procedures and relationships can enhance the SCM coordination in organizations [22].

3.3 Textile Industry of Pakistan: A Brief Review

Pakistan is the fourth prime creator of cotton in the world. The clothing industry is the backbone of exports; it has been the main driver of job creation and foreign currency earnings for the last 50 years. In Asia Pakistan is the eighth largest exporter and its involvement in gross domestic product is 8.5% and it creates 30% employment[10]. There are different sectors of textile industry including weaving, spinning, dyeing and finishing facilities.

3.4 Supply Chain Management and Textile Sector in Pakistan

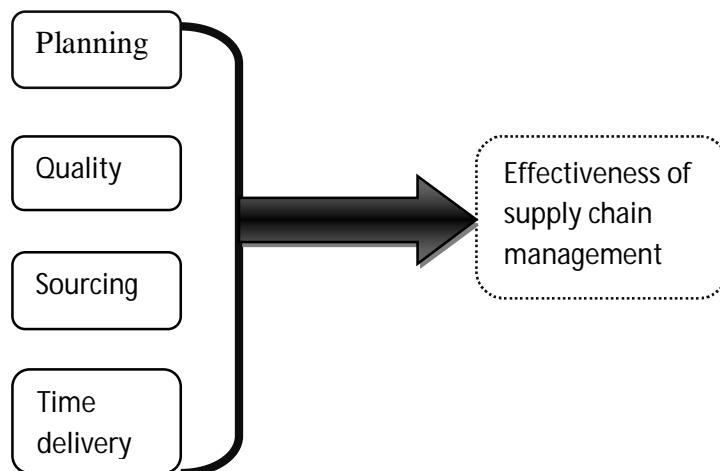
Supply chain management is considered to be strong in the sector of Pakistani textile industry because it is enjoying new technologies introduced by Germany, Switzerland, UK, USA, Japan and China. Currently, trainings are being launched by government to improve skills of operators and efficiency of processes, technologies and productivity. There is opportunity for textile to match cultural trends with the international level trends to introduce new flavors of fashion. Technology and communication systems increase integration at various levels but there is also need to improve research and development for new product systems[23].

Sourcing systems, logistics facilities, and technology innovativeness are crucial to compete successfully for consumer attention and to cope up with the pressure of speed up markets as well as asset allocation. So, the industry can adopt better lean supply chain systems for collaboration and inventory control[22].Supply chain model has significant impact on performance indicators like order fulfillment, Satisfaction, Production time and cyclic time [8].There are several issues regarding supply chain management being faced by Pakistani textile industry. Illiterate and less educated persons holding positions of managers and executives have no powerful resource planning systems (ERP) and therefore generate high costs and late delivery. To gain competitiveness in this arena, government and industries should focus on supply chain strategies that could be fruitful for Pakistan's textile industry[22]. By reviewing previous studies, gap has been found in the Pakistan's textile sector with reference to supply chain management.

4. Research Model and Hypotheses Development

Research model of present study describe the independent variables namely, planning, quality, sourcing and time delivery which are used to determine the dependent variable that is Supply Chain Management.

Figure 3.1. Research Model



4.1 Planning Vs Supply Chain Management (SCM)

Planning to define marketing making plans and market forecasting methods enhance the efficiency of SCM. For efficient working, compare prices of different suppliers and select those who have low prices, good quality of raw material and obtain discounts Underutilized capacity, industrial planning and machine upgrading planning are

also increases the effectiveness of supply chain in textile industry[24]. Planning link is developed by analysing the environment and related resources.SWOT anaalysis , analytical hierachical process (AHP) and analytical network analysis (ANP) are the main tools for making planing link and these steps are important for strategic desions which leads to cometitiveness[23].

4.2 Quality Vs Supply Chain Management (SCM)

Quality management is the system which leads to long term benefits by continuous improvements in processes through using different quality techniques. Due to globalization companies adopted those suppliers and partners who provide them good quality of raw material for final product. When the practices of SCM and quality management are integrated and communicated then it leads to continuous improvement and gain competitive advantage. Quality management activities like quality policy, objectives, responsibility and quality planning are important for efficient processes. Quality control, quality assurance and quality improvements leads to effective supply chain and increases the value of products and systems[25].

4.3 Sourcing Vs Supply Chain Management (SCM)

Sourcing and Effectiveness of SCM are very important to each other; outsourcing decreases the cost because companies prefer those sources which make material and products at low cost. Where labor and technological cost are lowest companies outsource from those countries. Sourcing also decreases Lead time to deliver material and inventory goods. For the effective supply chain firstly decided work with single or multiple suppliers, delegating or parallel sourcing. For outsourcing need assessment, negotiation and relationship management is very important. Through outsourcing companies can gain sustainable competitive advantage over competitors because they can access new technologies, skills, flexibility, speed and innovation in production systems that access world class capabilities[26]. Today's information technology helps organizations to ascertain close and long-standing contact with foremost suppliers in the course of enterprise resource planning (ERP), companies inter systems, electronic resource function, and (MRP), procurement electronic data transaction[27].

4.4 On-Time Delivery Vs Supply Chain Management (SCM)

Time delivery is another factor influences on supply chain efficiency. Contacting ability of the retailers to respond is important, if they respond quickly then material will reach on time for activities and demand will be fulfilled easily. The functions of auto identification to recover four basic logistics activities: distribution, transportation, getting and in-capability operations.ID assign the unique number to every item, store the product information and work electronically. That has ultimate affected on time delivery it reduces the cost and lead time. Beginning of such systems represents a main prospect to repair and develop tracing, Tracking operations, procedure control and management of inventory. New technologies are useful to do the work efficiently in supply chain and refused the cost and wastes[20].

4.5 Study Hypotheses

From research model, hypothesis of the research are as follows:

H1: There is positive relationship of planning and supply chain management (SCM) effectiveness in textile industry of Pakistan

H2: There is positive relationship of quality and SCM effectiveness in textile industry of Pakistan.

H3: There is positive relationship of sourcing and SCM effectiveness in textile industry of Pakistan

H4: there is positive relationship between time delivery and supply chain management effectiveness in textile industry of Pakistan.

5. METHODOLOGY

5.1 Data Collection & Analyses Tools

Past studies used different methods for data collection. This study used standardized questionnaire survey method to collect the data. Self administered questionnaire using five point likert scale ranging from "Strongly Disagree=1" and "Strongly Agree=5" were used in this study. The textile companies i.e. Kohinoor Faisalabad, Sadaqaat Textile Faisalabad, Masood Textile Faisalabad, Rashid Textile Faisalabad, Harappa Textile Harappa and Nishat Textile Lahore. Non probability sampling technique was used. Respondents of the study were managers, assistant managers and other staff officers who had authentic information about their supply chain systems and activities.The Study used statistical package for social sciences (SPSS) for analysis of data and findings. Chronbach's alpha, descriptive statistics, regression analysis and correlation were implied.

6. Findings

Table 6.1. Reliability Statistics

	MEAN	Standard. Deviation	N
Dimensions	Items	Cronbach's alpha	
SCM	3	.784	
Planning	4	.848	
Quality	4	.783	
Sourcing	3	.842	
Time delivery	6	.790	

Table 6.2. Descriptive Statistics

SCM	2.2767	1.14988	100
planning	2.3575	1.16897	100
Quality	2.7600	1.07304	100
sourcing	2.3667	1.23501	100
Time delivery	2.9217	.97484	100

Table 6.1 showed the reliability statistics of all variables i.e. supply chain management, planning, quality, time delivery, sourcing. All items had cronbach's alpha values greater than "0.7" which revealed that all the items have good internal consistency and responses were reliable. Table 6.2 shows the descriptive statistics which illustrate the mean score and standard deviation of variables. The mean score of 2.2676 showed overall effectiveness of SCM. The time delivery has the highest mean score value of 2.9217 and lowest standard deviation value of .97484. The mean scores of quality, planning and sourcing also show their considerable impact. The scattered plot matrix showed that the planning has highest value of correlation.

Table 6.3. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.74 3 ^a	.551	.533	.43952	.551	29.194	4	95	.000	1.708

a. Predictors: (Constant), quality, planning, outsourcing, time delivery
b. Dependent Variable: supply chain management

Table 6.3 depicts the model summary of regression analysis in which adjusted R² explain how much change is occurred in supply chain management due to time delivery, quality, planning and sourcing. The value of adjusted R²(.533) showed that 53.3% change in supply chain management occurred due to change in planning, quality, sourcing and time delivery. The results (Durbin Watson=1.708) also revealed the model fitness and no auto correlation.

Figure 6.1. Scatter Diagram

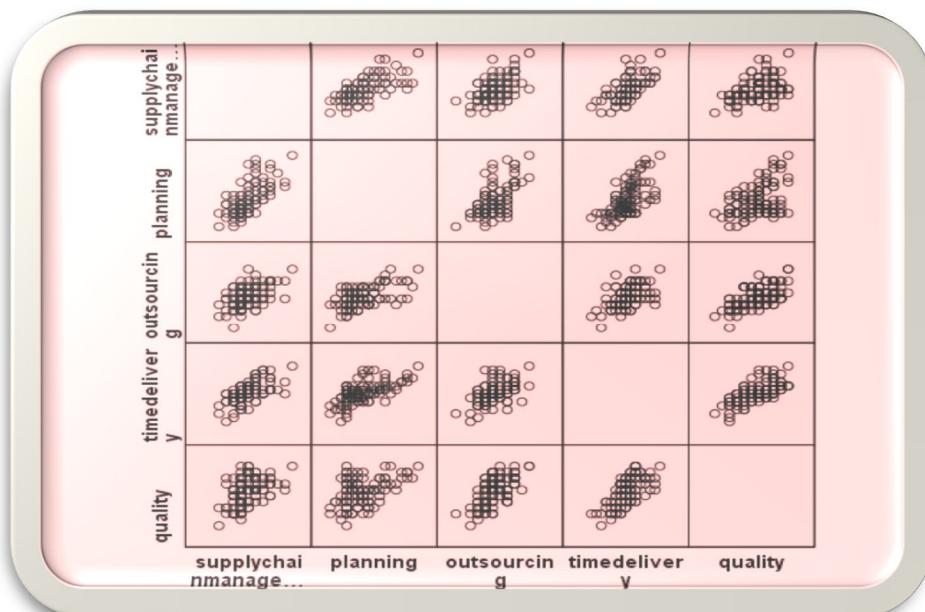


Table 6.4. ANOVA Statistics

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	22.558	4	5.640	29.194	.000 ^a
Residual	18.352	95	.193		
Total	40.910	99			

a. Predictors: (Constant), quality, planning, outsourcing, time delivery

ANOVA table 4 illustrates the overall regression model fitness ($df=495$, $p=.000$, $F=29.194$) for the data. Table shows that the time delivery, quality, planning and sourcing considerably predicts the supply chain management.

Table 6.5. Coefficients of Correlations

Model	Unstandardized Coefficients		t	Sig.	95% Confidence Interval for B	
	B	Std. Error			Lower Bound	Upper Bound
	Beta					
1 (Constant)	.216	.120	1.800	.005	-.022	.453
planning	.583	.138	.593	4.232	.000	.310
quality	.577	.082	.538	7.023	.000	.414
sourcing	.210	.116	.226	1.811	.003	-.020
Time delivery	.480	.085	.407	5.632	.000	.441

a. Dependent Variable: supply chain management

Table 6.6: Correlation Coefficients

		Correlations				
		SCM	planning	sourcing	Time delivery	quality
Supply chain management	Pearson Correlation	1	.681**	.529**	.642**	.449**
	Sig. (1-tailed)		.000	.000	.000	.000
	N	100	100	100	100	100
planning	Pearson Correlation	.681**	1	.592**	.624**	.445**
	Sig. (1-tailed)	.000		.000	.000	.000
	N	100	100	100	100	100
outsourcing	Pearson Correlation	.529**	.592**	1	.517**	.615**
	Sig. (1-tailed)	.000	.000		.000	.000
	N	100	100	100	100	100
Time delivery	Pearson Correlation	.642**	.624**	.517**	1	.671**
	Sig. (1-tailed)	.000	.000	.000		.000
	N	100	100	100	100	100
quality	Pearson Correlation	.449**	.445**	.615**	.671**	1
	Sig. (1-tailed)	.000	.000	.000	.000	
	N	100	100	100	100	100

**. Correlation is significant at the 0.01 level (1-tailed).

The standardized coefficients indicate how much dependent variable varies with independent variable when other factors remain constant. Planning has ($\beta=.593$, $t=4.232$) has a positive impact on supply chain management. The correlation analysis designated that planning has also a significant highest value ($r=.681$) regarding markets, industries and price comparison and it is positively associated with SCM. These results facilitate the acceptance of H1. The results about quality ($\beta=.538$, $t=7.023$, $r=.449$) showed that the quality of raw material, workers skills and quality control is positively linked with SCM. So, the study accepts H2. The sourcing ($\beta=.226$, $t=1.811$, $r=.529$) causes a weak positive effect on SCM when other factors remain constant. This also explained that the overall outsourcing, government regulation regarding oversees shipping and low transportation costs are positively associated to SCM. So, the study accepts H3. The time delivery ($\beta=.407$, $t=5.632$, $r=.642$) also exerts considerable impact on supply chain effectiveness. The supplier relationship, order delivery, order fulfillment, quick supplier

contact and supplier responses have a perfect positive relationship with supply chain management. So, it supports the acceptance of H4.

7. Conclusion and Implications

The study concluded that among all the independent variables, planning has the highest reliability. But, the other variables i.e. quality, sourcing and time delivery also have a higher internal consistency. This proved that the study has the validity and effectiveness in practical scenario. The textile industry grow up in last few years and effectiveness of supply chain management play critical part in the development of textile sector. Therefore, the effectiveness is enhanced by planning, quality, sourcing and time delivery. So, these determinants are necessary for efficiency of textile industry of Pakistan. This study gives special insights regarding effectiveness of the supply chain management and its need in improving the business activities in textile industry of Pakistan. Consequences of the study add to the academics gaps and authentic applications in industry. Organizations can adopt best practices of SCM to improve their processes by using the guidelines of this research. This study helps them out in increasing Pakistani exports through which GDP would grow, which ultimately boost the economy of Pakistan. There gap of research in textile sector provides the basis for research and guidelines of this research can be used for future work.

8. Limitations

The determinants i.e. planning, quality, sourcing and time delivery is not enough to describe a broader term like supply chain management. Future studies can take other factors affecting on competence and efficacy of SCM those are not considered in this study. Sample size was small to quantify respondents in evaluating the effectiveness of entire industry and to generalize the results.

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