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Factors Influencing the Performance of Supply Chain Management in Manufacturing Industry of Pakistan

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Abstract: The aim of this paper is to find out the effect of critical factors like trade management, information technology, uncertainties, manufacturing and customer satisfaction on the performance of supply chain management in Pakistan. The research was based on primary data which was collected through questionnaire by 172 selected manufacturing companies in Pakistan. The random Sampling Technique was used and the regression analysis was made to test the model through SPSS software. The regression analysis shows that R-Square = 0.567 F-Value = 50.76 and significance (P-Value <0.05) which shows strong significance relationship of each independent variable (trade management, information technology, uncertainties, manufacturing and customer satisfaction) on dependant variable (the performance of supply chain management).This research will help manufacturing and related industries in understanding of their current supply chain management practices and improve their performance in future.

Keywords: Trade Management (TM), Information Technology (IT), Uncertainties (U), Manufacturing, Customer Satisfaction (CS), Performance of Supply Chain Management.

1. Introduction

` All over in this universe reduced delivery time, reduced financial cost, higher customer satisfaction and very high level of trust among suppliers are the demonstrated results produced by supply chain management. Supply chain management (SCM) is the coordinated set of procedures which is used in receiving raw materials from suppliers, process those into final goods and then supply to end users. It is composed of chain-wide information, planning, resource management and performance measurement.

The delivery of manufactured product items in shape of lead-time and cost has changed. The competition has raised and it become hostile in current times (P. Vogt & A. Wojak, 2007). The causes of this type of situation are very much demands, improvement in technology, the globalization and process effectiveness of Supply Chain Management on manufacturing and Fashion Industry of Pakistan (H.J. Chao & V. Pucik, 2005). Textile and clothing are one of the top most manufacturing industries all over in the world and contributing highly considerably in the economical growth of developing countries. (M.D. Martino & A. Marasco, 2007) stated that Companies resort to supply chain practices to improve their performance. Value-added products can be the products that already exist; you only need to have smart modifications. According to (Bishop, 1990), value-added can be defined as “adding those manufacturing steps to a product, which the customer perceives that its value is increasing. Customers always pay the cost that they perceive is correct, and if they want to get something additional presented to the product; they only and only got value-added. There are two factors which are significant when we talk about value-added these factors are flexibility and quality. Production processes helps to improve value-added (Benetto, Becker and Welfring, 2009). As (Cooper et al, 1997) searched the importance of showing what processes to integrate with supply chain partners and management should be used for each process link.

Manufacturing industry contributes a very good portion of the Pakistani exports and playing its specific role in Pakistani economy. There are many different variables that affect SCM, but in our research we used Trade Management, Information Technology, Uncertainties, Manufacturing, Customer Satisfaction, and Performance of Supply Chain Management. All these variables are helpful for lowering the lead time of supply chain and cost.

2. Literature Review

2.1 Trade Management

Process strategies are used by firms to improve their manufacturing performance and to enhance business performance (Thomas et al., 2008). As (Sultan, 2006) suggested that process strategy management needs the identification of aims, the formation of policies and assignation of available and required resources for the implementation of plan. Companies are always expected to provide best quality at very low cost in order to achieve these goals, they look for tools and strategies that guide and help them to obtain very high process performance. Defect rate, rework rate and inventory turnover rate are some measures used for process performance (Pakdil, 2010). Marketing strategy can be defined as an organization's pattern of decisions that identify its crucial choices concerning products, marketing activities, markets, and marketing resources in the creation, communication and distribution of products that offer extra value to customers and thereby make the organization to achieve some set objectives (Varadarajan, 2010). Managers are always conforming the problems and knowing of how to apply marketing strategies in the firm. That might be better to enhance advertising, to create loyal programs, and to improve product quality by focusing on financial returns of marketing (Rust et al., 2004).

(Verhees and Meulenberg 2004) stated that innovation is the development and creation of a new product and process of implementation and acceptation of the new product. There are basically three stages at which innovation can be searched and studied the regional, sectorial, and project level. As (Meeus and Oerlemans, 2000) stated that innovation allows firms to grow and survive in the very complex markets. According to the (Organization for Economic Co-Operation and Development, 2005) innovation is the implementation of a new or improved process or a new marketing method, in business workplace organizations, practices. (Schramm, 2008) stated innovation as the design, invention and/or implementation of new or altered processes, systems, organizational structures, or models of business for the purpose of producing new value for customers and ultimately financial returns for the company. Changing social and demographic trends, regulatory requirements, competition, customer preference and technological changes have regularly undergone the SCM (Giannakoudi, 1999; Byers & Lederer, 200).

In the above literature Trade management is explained in terms of three different areas like innovations, process strategy and marketing strategy. We have given the name of trade management to the management of these three variables. Based on the above literature the following hypothesis is assumed to be true.

Hypothesis 1: Trade management has positive impact on supply chain management performance.

Hypothesis 1o: Trade management has no positive impact on supply chain management performance.

2.2 Information Technology

The computer technology and telecommunications permit all the actors in the supply chain to exchange the information among each other. The use of computer and information technology allows the distributors, retailers, suppliers, manufacturers, and customers to minimize lead time and other unnecessary activities. It is mentioned that managers will get considerable advantages with the use of IT, such as the fast flow of information in a coordinated way, data interchange and access to information improved the customer and supplier relationships, and inventory management on international level (Hand field & Nichols, 1999). The advantages will include supply chain contracts via internet, distribution, outsourcing and procurement of strategies, (Simchi-Levi et al., 2003). Almost all companies are looking for lead time reductions and cost with the specific purpose of improving service but also to increase inter-organizational relations (Humphreys et al. 2001).

(Tim, 2007) stated that through the use of communication technology, like as the web sites, industrial firms can build value in their supply chain relationships. According to (Turner, 1993), the key for success of supply chain management is the use of planning tools. He also told that without the use of IT, companies are unable to handle costs, provide superior customer service and become leader in logistics performance.(Turner,

1993) stated that firms cannot manage cost, provide high customer service, and become leaders in supply chain management without the incorporation of information technologies. As (Li, 2001) defined 14 such information technology tools, among all of them electronic data interchange, enterprise resource planning (ERP), internet and extranets. Li grouped all these tools into three main groups in terms of their primary purpose: resource planning tools, communication tools and supply chain management tools.

Communication tools are basically used to facilitate the transfer of data and communication between the trading units and include EDI, intranet, internet, electronic fund transfer (EFT), and extranet (Li 2002). As (O'Neill, 2008) stated that the advancement in information technology have made communication tools easier for users, in shape of allowing its presence in components to extend in the supply chain.

For better supply chain management, better information technology is also necessary. In this research paper, we have assumed communication technology as information technology. With out proper advancement in information technology, performance of supply chain management may not be increased. The following hypothesis is derived from the above literature to be true.

Hypothesis 2: *Information technology has positive impact on supply chain management performance.*
Hypothesis 2o: *Information technology has no positive impact on supply chain management performance.*

2.3 Uncertainties

Environmental uncertainty refers to issues related to environment in the product chain (Dwivedi and Butcher, 2009). According to (Ettlie and Reza, 1992) the environmental uncertainty is unexpected changes of supplier, competitor, customer, and technology. As (Yusuf, 1995) said that government support plays a vital for business success. As (Paulraj and Chen, 2007) suggested the environmental uncertainty as an important factor in the realization of strategic supply plans. Company environment factor is related to the company's relationship with suppliers and the level of commitment and trust. Company environment is also referred to quality, competition in the sector, on time delivery and the level of trust among firms. In order to effective respond to demand, companies think that imports are a good option for obtaining flexibility (Wu, 2006). As (Ambrose et al. 2010) studied that uncertainty negatively affects company performance. But this can minimized through strategic relationship with important suppliers is established (Chen et al.2004). So companies need to apply new strategies that permit them to deal with environmental uncertainties in the field of supply chain (Wu, 2006).

Government support is the level of support that the firm receives from the government when exporting or importing raw materials from overseas or consuming domestic materials. It consists of the use of policies, advice norms and regulations, for the sector. As it was searched by (Elzarka et al. 2011) described that how government can make a series of regulation and reforms to encourage exporters' by enhancing manufacturing sector's competitiveness in the international market through supply chain management. The increase of international trade for obtaining resources from overseas introduces complicated matters such as transportation, transportation costs, exchange rates, tariffs language barriers and administrative practices (Quayle, 2006).

The above literature shows that supply chain management performance is negatively impacted by uncertainty created by company's environment, overseas and supply competition. Therefore, it can be said that in order to improve the performance in supply chain management, companies must have to lessen the uncertainty factors which have directly or indirectly relationship with supply chain management performance. After the above literature survey the bellow hypothesis is assumed to be true.

Hypothesis 3: Uncertainty has negative relation with supply chain management performance.
Hypothesis 3o: Uncertainty has no negative relation with supply chain management performance

2.4 Manufacturing

Value added products can be defined as the products that already exist; you only use smart modifications. As (Bishop, 1990), defined that value added is adding those manufacturing to a commodity product, which the customer thinks as increasing its value. Customers want to pay the cost that is correct, and if they get something added to the product, they received value added. Two factors are very important flexibility and quality. As (Benetto, Becker and Welfring, 2009) stated that production processes helps to improve value-added.

Quality is not only a bonus for the customer; it is expected and is also important for the sale of a product. Poor quality means high costs, low productivity, and loss of market shares. Quality is meeting or exceeding the customer requirements (Bishop, 1990). It is possible by the use of quality metrics, which enhances the production system (Juran, 1988).The fast competition, complex markets and very fast changes in demand require that companies must be ready to serve very fast to customers' needs. The ability to react and adapt quickly to changes in the market is known as flexibility. (Bowersox, Closs, and Cooper, 2007) suggested that a logistical competency of an industry is measured by how well that firm is able to adapt and handle the unpredictable situations.

The research paper studies manufacturing in terms of flexibility in manufacturing and quality in manufacturing of products. Companies have flexibility in their products and can adopt the required products easily. Along with this manufacturing flexibility, they should also have the abilities of maintaining quality according to the customer expectations. The following hypothesis is made after study of literature.

Hypothesis 4: Manufacturing has positive impact on supply chain management performance.
Hypothesis 4: Manufacturing has positive impact on supply chain management performance.

2.5 Customer satisfaction

Companies always inclined to work with different types of suppliers in different ways. Therefore it is important that the strong relationship of firms with suppliers satisfies their company needs. (Hines, 2004) studied that in products, it is common to know relationship mainly based on price between buyer and supplier. Varieties of products are offered in the global markets as a result, companies trying to reduce costs and improve quality. As (Burguess, 1998) and (Hoek, 1999) stated that customers look for higher quality, and faster delivery.

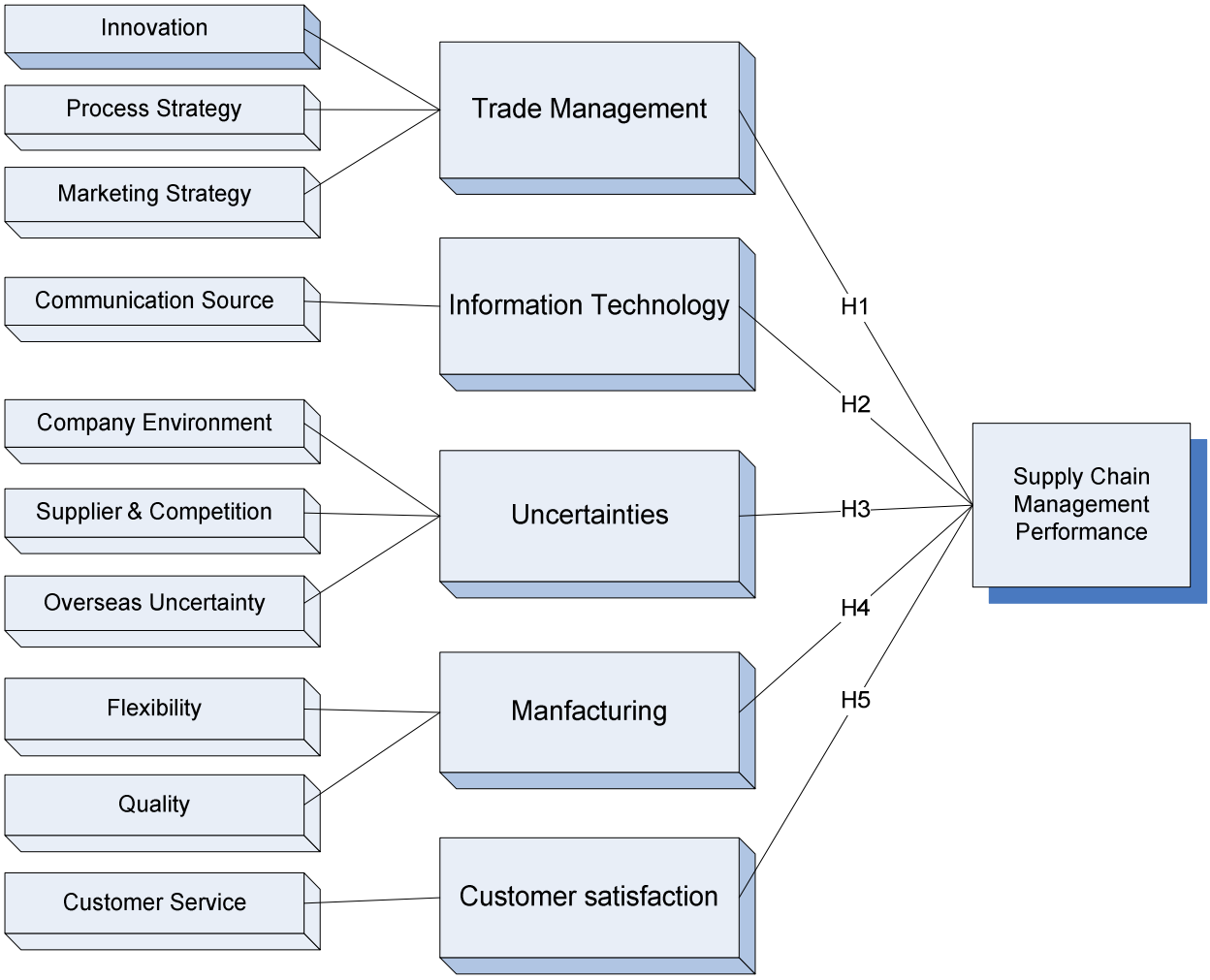
The product manufacturer's perception is not same as customer's perception. Customers may want more value to lower cost, on time delivery, delivery date certainty (Simchi-Levi et al., 2003). As (Kurata and Num, 2010) stated that manufacturers and retailers are looking for after sales policies that will allow them to increase customer satisfaction levels. An analysis conducted by (Ou, Liu, Hung and Yen, 2010) showed that customer-firm-supplier relationship management enhances operational performance and customer satisfaction. The main objective of companies is to give customers the best service in a very effective manner (Handfield and Nichols, 1999).

Customer is the main element of the supply chain management. It the one for which companies do business and because of whom there is a business. Without putting customers into consideration, it will be useless to study supply chain management performance. Therefore it can say that if the customers are satisfied then supply chain management performance will be increased. The following statement is assumed after analysis of the above literature.

Hypothesis 5: Customer satisfaction has positive impact on supply chain management performance.

Hypothesis 5: Customer satisfaction has not positive impact on supply chain management performance.

Figure 1 proposed model



3. Research Methodology

3.1. Instrument

The research was based on primary data which was collected through questionnaire by 172 selected manufacturing companies in Pakistan. The questionnaire was composed of six research variables. Each variable contained five questions, total number of research questions were thirty. The questionnaire recorded respondents' multi-item attitudes of each factor in the model using the five-point Likert scale from 1 being Strongly Disagree to 5 being Strongly Agree.

3.2. Procedures

We visited all these organizations and first of all we informed the respondents that all their information will keep confidential if required and then received the feedback directly from the respondents on the spot.

3.3. Sampling

In this research we used random sampling technique to select sample from population. In random sampling all the population has equal probability or chances to be selected.

3.4. Data collection

In this research we used questionnaire which consists of 30-Questions of 6 variables of Effect of Critical Factors on the Performance of Supply Chain Management in Manufacturing Industry of Pakistan We distributed 200 questionnaires and 172 completely filled questionnaires were used for regression analysis.

3.5. Data analysis

First of all the reliability of questionnaire was tested by SPSS software then the regression analysis was made to test the model in order to reveal the research results.

4. Results and discussion

4.1 Regression Analysis of the Model

Regression analysis is applied to test the model, in model testing we want to know the relationship of each independent variable with dependent variable. As the regression table-1 given below shows that, R-Square = 0.567, F-Value = 50.76 and significance (P-Value <0.05). It means that strong significance is found for all variables in other words there is reliable relationship. All the independent variables and dependent variable taken in research have varying degree of importance for effect on the performance of supply chain management. The following summaries and its coefficients show the reliable relationship of all the independent variables like Trade Management, Information Technology, Uncertainties, Manufacturing, Customer Satisfaction, with dependent variable Performance of Supply Chain Management. This means that we, related organizations and other future researcher can use all the relationship for making predictions of effect of critical factors on the performance of supply chain management.

Table 1: Regression Analysis of the Model

Model	B	Std. Error	T-Statistic	Sig.	R-square	F-Statistics	P-Value
Constant	2.05	.287	7.400	.000	0.567	50.76	.000
TM	.138	.087	1.207	.045			
IT	.449	.139	3.200	.003			
U	.698	.112	6.5o7	.001			
M	.129	.87	1.800	.044			
CS	.649	.065	10.200	.000			

Constant TM, IT, U, M, CS
Dependent Variable: SP

For better understanding of the regression analysis of our proposed model we explain the relationship of each independent variable with dependent variable.

In case of Regression Analysis of Trade Management with Supply Chain Management Performance the regression result given in table-2 R-Square = 0.567, F-Value = 50.76 and significance (P-Value <0.045) shows the positive significance relationship. This means that there is significance role of trade management for supply chain management performance. Supply chain management can be effectively enhanced if the trade management factors like innovation, process strategy and market strategy are properly managed.

As the regression result in table-3 shows that R-Square = 0.567, F-Value = 50.76 and significance (P-Value <0.003) which shows the positive significance relationship between Information Technology with Supply Chain Management Performance. As Pakistan is developing country, it's IT and Telecom sectors are still required to improve technologically. So this research suggests that there is significance and very important role of Information technology for improving supply chain management performance.

In the above table, the result of regression analysis for Uncertainties with Supply Chain Management Performance shows that the value of R-Square is 0.567 and the F-value is 50.76. The results reveal that the model is significant (p<0.001) and there is positive significant relationship between Uncertainties with Supply Chain Management Performance.

As the regression analysis for manufacturing given in table-5 shows that, R-Square = 0.567, F-Value = 50.76 and significance (P-Value <0.044). Which reveal that in our proposed model there is positive relationship between manufacturing and Supply Chain Management Performance?

The regression result for customer satisfaction in table-6 shows that, R-Square = 0.567, F-Value = 50.76 and significance (P-Value <0.000) reveal that in our proposed model there is strong positive relationship between independent and dependent variables. The above given results also tell that customer satisfaction is a key factor for improving the performance of supply chain management.

5. Conclusion

The results given in regression analysis show the positive significant relationship between independent and dependent variables, also these results can help for different supply chain network of different companies working in Pakistan and related organization like manufacturers to make better understanding of their supply chain management practices. The Findings provide a framework by identifying and testing five factors like Trade Management, Information Technology, Uncertainties, Manufacturing, and Customer Satisfaction. The different supply network companies of Pakistan and manufacturing companies could achieve improvements in supply chain performance through the effective management of critical factors identified in the research. The related organization can use these research results from this research in order to design technical assistance and educational programs.

6. Recommendations

After result and discussion, following recommendations are made for manufacturing and related industries in order to improve their supply chain performance.

1. Effective management of value-added process (manufacturing) must be the top priority of manufacturers as it directly effects the relation of supply chain and supply chain performance.
2. It is an art how to communicate with supplier and making different plans with them regarding supply of different products which manufacturers should be aware. Understanding the significance of this concept and increasing the importance of supply chain relationships will improve customer satisfaction.
3. As the information technology is main source of improvement in customer and supplier relationship. When this area is satisfied then automatically supply chain performance will increase. Therefore it is essential that the flow of information and access of information should in according manner.
4. Companies must focus their efforts on improving competitiveness in order to achieve customer satisfaction. This customer satisfaction can be achieved by adding value in products.
5. Companies must be aware of customer demand of globalization of markets, fast changes in customer demand, and changing of technology requirements. It will improve the manufacturing performance as well as supply chain management performance.

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