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Information Technology Enabled Tools and Customer Relationship Management in Supply Chain Practices

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Abstract: Customers have become the inevitable part of manufacturing since last few decades. The paradigm shifts of product orientation to customer orientation have made it clear that products are to be made as per the necessity of customers. Supply chain management is one area in manufacturing where this change of orientation is clearly visible. Manufacturers have inducted supply chain management as a core practice for the development of their goodwill. The relationship maintaining with the customer has been the key for success in the modern times. The uses of Information technology in supply chain practices have made a advancement in competency level of the organizations. Here the research is aimed to find how much these IT enabled tools are useful in maintaining customer relationship in supply chain management practices of manufacturers. The research is confined to the state of Kerala as it is one potential hub for development in this time. Customer relationship management is the practice of managing companys interaction with its customers. It involves technology to organize, synchronize and automate the companys supply chain practices including sales and marketing. It provides a strategic identity of important customers in supply chain and easily executes the necessary activities. The output of the study will provide a clear idea of how much the performance of an organizations supply chain can be improved through implementing IT enabled tools in its CRM.

Keywords: Customer Relationship Management, Electronic Data interchange, Enterprise Resources Planning, Inbound Logis- tics, Outbound Logistics

I. INTRODUCTION

An efficient supply chain brings an effective core compe- tency in todays fast moving economy. Whether men machine materials money or anything may be, procurement to produc- tion and delivery to customer at exact time and for the feasible cost is the most important thing. Information technology is the most essential tool for performing these activities of SCM to conduct a successful business. Without which the

organizations cannot communicate faster and the leverage of relationship maintaining with the customer will also get affected very easily. Hence it is essential to access, communicate and identify the core advantages that the company has.

During the last four decades SCM has been the area of focus for manufacturers where productive decisions are made. By coordinating the procurement, production and delivery, organizations are able to meet customer demands effectively. However synchronized supply chains are the latest views of focus in industry nowadays. Through these synchronized supply chains, the overall goals remain unchanged and the company is able to create a critical factor of success. The manufacturers of modern times are trying to eliminate the middle man between production and delivery. Recently the trends are focusing on direct customer delivery of products and direct order reception. This has changed the thought pattern of supply chains. Hence CRM (Customer relationship management) have developed as a most contributing area in SCM practices.

CRM focuses on potential markets and potential customers, leaving the minor players in the chain apart. The motive is to build relationship with customers of higher value and potential. It is because of the reason that building relationship with customers of least value is considered as a waste of time and cost incurred will be very high.

CRM can be classified as three phases which it passes through. The first being Acquiring of new customers who are potentially good for the business. The second phase is Enhancement of customers through high response service and making customer happy. The final phase is to Retain the customers over a long period of time.

Hence the CRM can provide high interaction with the customers and generate customer demand and facilitate them successfully. IT is one factor which enables and maintains the integration of this CRM with supply chain without breakage. So to know the effectiveness of CRM in SCM practices through implementation of IT enabled tools are of great importance today. Thus this research forms a part of unveiling the association between effectiveness of Supply chain practices and use of IT enabled tools in CRM.

II. OBJECTIVES

The study is aimed to understand the effectiveness of CRM through implementation of IT enabled tools in Supply chain practices. It also focuses on how far the improvements are there in the performance of Supply chain practices when IT enabled tools are implemented.

III. METHODOLOGY USED IN THE STUDY

Here the study is descriptive in nature based on the primary data from structured questionnaire. The total number of manufacturing industries in Kerala state has been taken as the population and a sample of 360 manufacturing units were taken as sample size through stratified random sampling procedure from a total population of 2532 registered manufacturing units in Kerala. Interviews were conducted and the results are analyzed using Chi square analysis, ANOVA and Correlation analysis. The association between the Effectiveness of IT enabled tools in CRM practices and the effectiveness of performance improvement in SCM practices are plotted.

IV. DISCUSSION

Effective Supply chain management using IT enabled tools can reduce the lack of consistency and increase the accuracy of CRM. Information Technology enabled supply chains will result in reduced costs incurred by all supply chain players involved, as relationships become secured and established, when the product demand is rightly aligned, the total costs incurred by all the organizations are less. This in turn creates a great Competitive Advantage which all the organizations are monitoring and initiates competition among the manufacturing organizations, which will ultimately benefit the customers through reduced price and improved quality.

The five variables taken here for study are namely:

- 1) Customer Data
 - 2) Feedback
 - 3) Goals achievement
 - 4) Service orientation
 - 5) Competitive advantage
- 1) Customer Data: This emphasizes on five basic en- quiries Whether the Data Access and retrieval made easy through IT integration and the Order process- ing made accurate through information technology. Further a five point scale rating is continued to another three questions regarding the Service reports made available to proper authority at regular intervals without fail, Lot sizing and order batching without bias and , Shipment consolidation done as per the data input without delay.
 - 2) Feedback: Feedback plays an important role as the rating of the entire CRM and SCM depends on the feedback provided by the customers. Feedback extends its application by MIS management made more easy and credible by technology implementation, Product redesign done effective by technology implementation, Quality benchmarking made successful through information sharing, Supply response recorded for future usage as bias is eliminated and Increased flexibility and decision support by decen- tralization of data is done.
 - 3) Goals achievement: achieving goals are the most fore looked area in SCM practices. It is important to understand whether Incomplete mix of goals are eliminated through proper information availability, Inade- quate level of user participation is reduced through authority differentiation in MIS, Inappropriate language barriers eliminated by universal medium, Market expectations analysis done properly and Logistics outsourcing decisions done effectively by mathematical methods.
 - 4) Service orientation: service plays another important role as the customer is focusing on this aspect provided by the manufacturer. Improvement in service can have a hard change in improvement of quality provided by the manufacturer. Also Process integration is made more successful through technology sharing and information gathering. Collaborative solutions through MIS management are more intensely done through IT integration in CRM and also Routing delays are eliminated through calculations by soft- wares. More over common systems will be adapted by the organizations for maintaining a bench mark in service.

- 5) Competitive advantage: the main competitive advantage will be for marketing as the integration of IT tools will always make Marketing related activities easy and effective. Further, Sales and related things will be enhanced through information sharing using technological advancement and this will also lead for automated order processing and focusing on prime customers. Altogether strategic planning and demand management can be clearly plotted and maintained through the implementation of IT enabled tools in SCM practices and this in turn will result in effective CRM.

V. ANALYSIS AND FINDINGS

Table 1
Respondent Survey on Level of Effectiveness of IT Enabled Tools in CRM

<i>Level of Effectiveness in CRM</i>	<i>No of Respondents</i>	<i>Percentage</i>
Low	92	25.6
Moderate	171	47.5
High	97	26.9
Total	360	100

From the above depicted figure it can be easily understood that 47.5 percentage of the respondents have a moderate opinion about the level of effectiveness in CRM through IT enabled tools in SCM practices. 27 percentage have shown great regards and together this will create around 75 percentage of positive reply. Only 25 percentage of respondents say they are unaware of the effectiveness that can be created through IT enabled tools Level of effectiveness and Performance Improvement.

The following hypothesis is formulated to study the association between the level of effectiveness of IT enabled tools in CRM and performance improvement through these IT enabled tools.

Null Hypothesis: H₀ - There is no Association between Level of Effectiveness of IT Enabled tools in CRM and Performance improvement through IT enabled tools.

Chi square analysis is done to analyze and the results are displayed in the table.

As the p value is less than 0.01, H₀ is rejected at 1 percent level of significance. Therefore, it can be concluded that there is association which exists between the Effectiveness of IT enabled tools in CRM and performance improvement of SCM practices. Based on the row percentage, 55 percentage of total respondents are having opinion of moderate level of improvement and 36 percentage of respondents reply that supply chain performance have tremendous improvement when IT enabled tools in CRM is available.

IT Enabled Tools and CRM Variables

A hypothesis is formulated to find the significant difference among IT enabled and the variables of Customer Relationship Management.

Second Null Hypothesis: H₀ - There is no significant difference among IT enabled Tools used in Company with respect to factors under study.

Table 2
Level of Effectiveness of IT Enabled Tools in CRM and Performance Improvement through IT Enabled Tools Performance improvement through IT enabled tools

<i>Level of Effectiveness of IT Enabled tools in CRM</i>	<i>Low</i>	<i>Moderate</i>	<i>High</i>	<i>Total</i>	<i>Chi-Square</i>	<i>p Value</i>
Low	41 (44.6) [42.3]	40 (43.5) [29.0]	11 (12.0) [8.8]	92		
Moderate	32 (18.7) [33.0]	70 (40.9) [50.7]	69 (40.4) [55.2]	171	37.378	0.000**
High	24 (24.7) [24.7]	28 (28.9) [20.3]	45 (46.4) [36.0]	97		

The Value within () refers to Row Percentage, [] refers to Row Percentage ** denotes significance at 1% level

ANOVA is used to find out the significant difference and the results are provided in the following table Since P value is less than 0.01, null hypothesis is rejected at 1% level with regard to the factors of study related to CRM and the IT enabled tools in the SCM practices. Hence there exists significant difference among the factors of CRM and the different IT enabled tools used in SCM practices. So it can be interpreted that each IT tool have its own benefits in CRM and are playing a critical role in the development of SCM practices.

Effectiveness of IT Enabled tools in CRM and Performance Improvement of SCM

A hypothesis is developed to find the association between effectiveness of IT enabled tools in CRM and performance improvement of Supply Chain Practices.

Third Null Hypothesis: H0 - There is no Association occurring between Level of Effectiveness of IT Enabled tools in CRM and Performance improvement through IT enabled tools.

Chi square analysis is used to analyze the collected data and the output is depicted in the table below

Since the p value is below 0.01, the null hypothesis is rejected at 1 percent level of significance. So concluded that there is association between the levels of effectiveness of IT enabled tools in CRM and performance improvement in SCM practices. AS the IT enabled tools become more effective in creating efficient and effective Customer relationship, the responsiveness of Supply chain also increases.

CRM and Effectiveness of SCM Practices

A correlation between the factors of CRM practices and overall effectiveness of SCM practices are plotted using Pear- son Correlation Coefficient and the results are plotted below.

The correlation coefficient between Feedback and Cus- tomer data is 0.469 which indicates a positive relationship between Feedback and Customer data in CRM practices. The correlation coefficient between Feedback and achievement of goals is 65.7 percentages which in turn is a positive indicator of relationship in CRM practices within them. 78.3 percentage positive correlation is there between goals achievement and service orientation. This states that once service orientation is successful, the achieving of goals by the firm happens effectively. Competitive advantage of service orientation also takes 21 percent positive correlation and hence the overall effectiveness of IT enabled tools in CRM and the effectiveness of SCM practices is having a positive correlation.

VI. FINDINGS

- Which customer is to be targeting and how they should be identified and tackled and many more such marketing decisions can be made easily through the data available in CRM when IT enabled tools are implemented.
- Strategic planning and demand planning is made easy through the implementation of IT enabled tools as the prime customers and their purchase requirements are pre calculated.
- Transmission and tracking is facilitated using CRM when IT enabled tools are implemented. This in turn makes the supply chain more responsive.
- Actual sale to the customer can be focused when IT enabled tools are present
- The ability to provide sales force a due date to make sale and which target should be focused can be clearly identified
- Satisfaction and dissatisfaction level of customers can be easily identified from the feedback data
- Order management is made as per the priority of customer and hence the customer delivery can be done more accurate and precise.
- Real time scheduling is made possible if IT enabled tools are present

Table 3
IT Enabled Tools used in the Company with Respect to Factors of SCM Practices

	<i>Tools Used in the Company</i>				<i>f Value</i>	<i>P Value</i>
	<i>ERP</i>	<i>Barcoding</i>	<i>Internet</i>	<i>Others</i>		
Customer Data	17.38 (6.72)	24.10 (1.52)	17.47 (5.96)	16.59 (6.04)	4.717	0.003**
Feedback	22.25 (1.67)	23.30 (1.42)	21.01 (2.85)	20.15 (3.28)	4.622	0.003**
Goals Achievement	19.88 (2.85)	23.80 (1.03)	20.47 (3.32)	18.38 (4.62)	10.126	0.000**
Service Orientation	18.50 (7.13)	23.40 (1.43)	19.64 (4.55)	17.25 (5.99)	7.129	0.000**
Competitive Advantage	22.88 (1.46)	23.90 (.99)	21.75 (2.43)	21.12 (3.61)	3.945	0.009**
Overall Effectiveness of IT enabled tools in CRM	100.88 (13.70)	118.50 (2.99)	100.35 (14.16)	93.49 (18.68)	9.55	0.000**

Table 5
Effectiveness of IT Enabled Tools in CRM and Overall Effectiveness in SCM Practice

<i>Factors of Effectiveness of IT enabled tools in CRM</i>	<i>Customer Data</i>	<i>Feedback Goals</i>	<i>Achievement Service</i>	<i>Orientation Competitive</i>	<i>Advantage</i>	<i>Overall Effectiveness in SCM Practices</i>
Customer Data	1	0.469(**)	0.527(**)	0.484(**)	0.150(**)	0.524(**)
Feedback		1	0.657(**)	0.390(**)	0.540(**)	0.679(**)
Goals Achievement Service			1	0.783(**)	0.345(**)	0.716(**)
Orientation				1	0.211(**)	0.576(**)
Competitive Advantage					1	0.544(**)
Overall Effectiveness in SCM Practices						1

** denotes significant at 1% level

- Faster order delivery cycles are created as a result of IT enabled tools in CRM.
- The total performances of SCM practices are highly enhanced when IT enabled tools are implemented in CRM.

VII. CONCLUSION

Lean manufacturing is the most modern trend in manufacturing sector. Concurrent engineering have made it possible to keep a right track of inventory used for manufacturing. When the Information technology enabled tools are implemented, the collection, input, retrieval and other activities regarding the customer details are made fast and hence the manufacturers have a track of whom to be delivered and when to be delivered. IT has opened a huge door of possibilities in SCM practices of industries all over the world. If exploited in the right manner, globalization can be made possible for any organisation in a easy manner. ERP, EDI, SCIS etc are some softwares that organizations use for CRM practices and modules of CRM are stand alone available for usage. Information is inevitable for managers in Supply chains as they help for executing transactions, planning the demand and catering the products at right time for the right cost. Without information managers can take decisions only blindly which in turn will result in Bull whip effect if not taken into concern.

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