

An Evaluation of SCM Initiatives in Indian Manufacturing Industries

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Abstract –Delivering great quality and decrease cost is a key component of each venture and firm. Now days there is exceptionally hard to contend our organizations when organization experience improvements. So get great related these organizations embrace some lean assembling process. In this proposed paper, examine around one system. SCM. Is presented in 1990. SCM tries to improve the standard of yield by recognizing and expelling of reasons for imperfections. In this we get information from different enterprises and an unwavering quality test, AHP, VIKOR. Furthermore, done relationship investigation. From these we get comes about this how profitability and cost relies on upon various elements of any industry. In this research paper, we made Karl Pearson Correlation Matrix, which demonstrates the connection amongst info and yield components with the quality and development. Toward the end, we reasoned that SCM made a perceptible commitment, representatives working all the more helpfully, change in the nature of the item, efficient working aides in accomplishing positive outcomes, inspiration and support from top administration and group pioneer influences the execution.

Index Terms –SCM(Supply Chain Management), Correlation Matrix, Quality Test and development, AHP and VIKOR.

1. INTRODUCTION

In business, production network administration (SCM), the administration of the stream of merchandise and enterprises, includes the development and capacity of crude materials, of work-in-process stock, and of completed merchandise from the purpose of causing to the purpose of utilization. Interconnected or interlinked systems, channels and hub organizations join in the arrangement of items, and administrations required by end clients in an inventory network. A store network administration has been characterized as the "outline, arranging, execution, control, and observing of production network exercises with the goal of making net esteem, fabricating an aggressive framework, utilizing overall co-ordinations, synchronizing supply with the request and measuring execution all around [1].

SCM rehearse draws intensely from the territories of mechanical building, frameworks designing, operations, administration, co-ordinations, obtainment, data innovation,

and showcasing and makes progress toward an incorporated approach. Showcasing channels assume an imperative part in store network administration. If your organization makes an item from parts bought from providers, and those items are sold to clients, then you have an inventory network. Some supply chains are straightforward, while others are fairly confused. The multifaceted nature of the store network will change to the extent of the business and the unpredictability and quantities of things that are produced. Expanding on globalization and specialization, the expression "SCM" has been authored to portray both changes inside supply chains themselves and in addition the advancement of procedures, strategies, and devices to oversee them in this new "time". The developing ubiquity of community oriented stages is highlighted by the ascent of TradeCard's store network cooperation stage, which associates various purchasers and providers with money related organizations, empowering them to lead mechanized production network fund transactions [2].



Figure 1. Supply Chain Management

The web is a pattern in the utilization of the World Wide Web that is intended to build inventiveness, data sharing, and coordinated effort among clients. At its center, the basic trait of Web is to help explore the endless data accessible on the Web keeping in mind the end goal to discover what is being purchased. It is the idea of a usable pathway. SCM repeats this idea in inventory network operations. It is the pathway to SCM comes about, a blend of procedures, systems, instruments, and conveyance choices to guide organizations to their outcomes rapidly as the multifaceted nature and the speed of the inventory network increment because of worldwide rivalry; quick value variances; changing oil costs;

short item life cycles; extended specialization; close, far, and offshoring; and ability shortage.

On the off chance that an organization hopes to accomplish profits by their production network administration handle, they will require some level of interest in innovation. The spine for some huge organizations has been the endlessly costly Enterprise Resource Planning (ERP) suites, for example, SAP and Oracle. These undertaking programming usages will incorporate an organization's whole store network, from the buying of crude materials to guarantee administration of things sold. The many-sided quality of these applications requires a critical cost, a financial cost, as well as the time and assets required to effectively actualize a venture wide arrangement. Purchase in by senior administration and sufficient preparing of staff is vital to the achievement of the usage. There are presently numerous ERP answers for browse and it is vital to choose one which fits the general needs of an organization's inventory network[3].

A simple supply chain is made up of several elements that are linked with the movement of products along it. The supply chain starts and ends with the customer.

- Customer
- Planning
- Purchasing
- Production

Following activities involved as part of company supply chain management.

1. Inventory management.
2. Transportation service procurement.
3. Material handling.
4. Inbound transportation.
5. Warehouse management.[5]

The study is aimed at evaluation of SCM initiatives in the Indian manufacturing industries in order to enhance performance. The study also critically examines the supply chain management factors affecting the strategic success of these organizations. Moreover, the study illustrates the relationship of scm and Strategic Success factors in Indian auto manufacturing industries to have overall business performance. The major objective of this research is to examine, how to evaluate the scm effects the strategy formation and thus organization's success. Lastly the research culminates with the development of SCM model for Indian automobile manufacturing unit for growth and competitiveness. Primarily, the focus of this research was to determine the impact that SCM has on strategic success when

viewed from an Indian manufacturing industries' perception. This chapter presents the conclusions and recommendations for future from this study.

After reviewing more than 30 papers, it was observed that the impact of Implementingscm on strategic success has not been addressed yet. Based on the research gaps, the objectives are framed and issues for the study were listed along with the methodology adopted for the research work. Initially there are 11 input and 11 output variables. [4]

During this research work, a questionnaire was prepared for the survey to be conducted in the North Indian manufacturing industries units. For the questionnaire a pilot survey was made in finalizing the questionnaire. During the pilot survey, academicians, industrialists, existing literature were consulted. Responses to the questionnaire were received from 80 units.

After completing the survey, preliminary analysis of the data was carried out. Firstly, Croanbach alpha, a reliability analysis was performed to analyze the questionnaire prepared. Then various quantitative techniques were employed like, PPS. This was followed by correlation and regression analysis of the above data. Based on the data analysis, factors were selected for detailed study in various manufacturing units.

Then it was followed by qualitative analysis of the data. Firstly, AHP followed by Vikor.

2. BACKGROUND

Six noteworthy developments can be seen in the advancement of the production network administration thinks about: creation, incorporation, and globalization,[6] specialization stages one and two, and SCM:-

2.1 Creation era

The expression "store network administration" was initially begun by Keith Oliver in 1982. Nonetheless, the idea of a storage network in the administration was of incredible significance some time before, in the mid twentieth century, particularly with the formation of the sequential construction system. The qualities of this period of store network administration incorporate the requirement for extensive scale changes, re-building, cutting back driven by cost diminishment programs, and boundless thoughtfulness regarding Japanese administration rehearses.[7]

2.2 Integration era

This time of store network administration studies was highlighted with the advancement of electronic information exchange (EDI) frameworks in the 1960s, and created through the 1990s by the presentation of big business asset arranging (ERP) frameworks. This period has kept on forming into the 21st century with the extension of Internet-based community

oriented frameworks. This time of store network advancement is described by both expanding esteem included and cost decreases through the mix. [15]

2.3 Globalization era

The third development of production network administration, advancement, the globalization time, can be described by the consideration given to worldwide frameworks of provider connections and the extension of supply chains past national limits and into different land masses. In spite of the fact that the utilization of worldwide sources in associations' supply chains can be followed back quite a few years (e.g., in the oil business), it was not until the late 1980s that an extensive number of associations began to incorporate worldwide sources into their center business.[14]

2.4 Specialization era

(Stage I): outsourced manufacturing and distribution

In the 1990s, organizations started to concentrate on "center skills" and specialization. They surrendered vertical combination, sold off non-center operations, and outsourced those capacities to different organizations. This changed administration prerequisites, by augmenting the inventory network past the organization dividers and appropriating administration crosswise over particular store network associations.

This move likewise refocused the principal points of view of every association. Unique hardware producers (OEMs) moved toward becoming brand proprietors that required perceivability profound in their supply base. They needed to control the whole inventory network from above, rather than from inside. Contract makers needed to oversee bills of material with various part-numbering plan from numerous OEMs and bolster client demands for work-in-process perceivability and seller oversight stock (VMI). [12]

2.2 Levels of SCM (Supply Chain Management)

To ensure that the storage system is filling in as gainful as could sensibly be normal and making the most lifted measure of customer reliability in any event cost, associations have gotten Supply Chain Management frames and related development. Stock system Management has three levels of activities that different parts of the association will focus on: fundamental; key; and operational.:-

2.2.1 Strategic:

At this level, organization, administration will look for abnormal state key choices concerning the entire association, for example, the size and area of assembling destinations, organizations with providers, items to be made and deals markets.[8]

2.2.2 Tactical:

Vital decisions focus on grasping measures that will convey cash sparing preferences, for instance, using industry best chips away at, working up a scoring system with favored suppliers, working with collaborations associations to make cost affect transportation and making circulation focus approaches to reduce the cost of securing stock.

2.2.3 Operational:

Choices at this level are made every day in organizations that influence how the items move along the inventory network. Operational choices include rolling out timetable improvements to generation, acquiring concurrences with providers, taking requests from clients and moving items in the stockroom. [13]

3. LITERATURE SURVEY

BrotoRauthBhardwaj (2016)[4] Green supply chain management (GSCM) has become the driver of sustainable strategy. This topic has been gaining increasing attention within both academia and industry for making the industry competitive. With the ever increasing demand for reducing carbon footprints and greenhouse gas emission, there is a need to study the various parameters and drivers of sustainable development, especially in supply chain management. The need for developing the sustainable model, including the drivers of sustainability needs to be designed. The paper aims to discuss these issues. After providing a background discussion on GSCM, the authors categorize and review recent GSCM literature under three broad categories, with a special emphasis on investigation of adoption, diffusion, and outcomes of GSCM practices. Within this review framework, the authors also identified GSCM research questions that are worthy of investigation. The study suggests that the main drivers of GSCM include the environmental policy and the green human resource management by providing them training for adopting sustainability practices. Besides this, another key driver is the sustainability criteria in supplier selection which was found to be enhancing the outcomes of sustainability. Chin-Chun Hsu et al. (2016) [16] explores the Global outsourcing shift manufacturing jobs to emerging countries, which provides new opportunities for improving their economic development. The authors develop and test a theoretical model to predict first, how sustainable supply chain initiatives might influence reverse logistics outcomes and second, the impact of eco-reputation and eco-innovation orientation strategies for the deployment of sustainable supply chain initiatives. The results show that firms that implement sustainable supply chain initiatives can realize positive reverse logistics outcomes; the study also provides new insights into eco-innovation and eco-reputation strategic orientations as theoretically important antecedents of sustainable supply chain initiatives. Dayna F. Simpson (2005)

[9] this paper aims to discuss the issue with the ever increasing demand for reducing carbon footprints and greenhouse gas emission, there is a need to study the various parameters and drivers of sustainable development, especially in supply chain management. The need for developing the sustainable model, including the drivers of sustainability needs to be designed.. After providing a background discussion on GSCM, the authors categorize and review recent GSCM literature under three broad categories, with a special emphasis on investigation of adoption, diffusion, and outcomes of GSCM practices. Within this review framework, the authors also identified GSCM research questions that are worthy of investigation.

The study suggests that the main drivers of GSCM include the environmental policy and the green human resource management by providing them training for adopting sustainability practices. Besides this, another key driver is the sustainability criteria in supplier selection which was found to be enhancing the outcomes of sustainability. Davide Aloini et al.(2012) [10]The purpose of the present study is to analyze the development of supply chain management introduction in the construction industry, investigating the risk factors affecting the implementation of SCM Principles. To achieve the research objective a literature review approach was adopted, which involved the selection and classification of about 140 research articles. Papers were critically classified and analyzed according to a risk management (RM) perspective. Dasgupta T., (2003) [11] Their research explores the magnitude and duration of the negative impact on reported profits experienced during a lean manufacturing implementation.

Their research uses a multi-period simulation model of a production operation that incorporates a manufacturing planning and inventory tracking system. A hybrid simulation approach is employed using Microsoft Excel to model the Manufacturing Resource Planning (MRPII) function, while Pro Model simulation software is used for the development and operation of the model production environment. Microsoft e Visual Basic is used to create a bridge between systems for schedule dissemination and inventory updates.

4. PROPOSED WORK

The present research work has emphasized on the following research proposal define in below:

1. Synthesizing the concept of Success in Indian Manufacturing Industry.
2. Exploring SCM initiatives in then Indian Manufacturing Industry.
3. Analyzing the impact of SCM on Success in Indian Manufacturing Industry

4. To look for sources of revenue and cost.
5. To maximize overall value generated

For accomplishing the objectives of the proposed study, the following methodology has been followed:-

1. The detailed literature review has been carried out to ascertain the significance of SCM and Success.
2. A survey of several automobile manufacturing units has been completed through a Specially prepared questionnaire for understanding and assessing the current situation.
3. Suitable qualitative and quantitative techniques have been employed to correlate SCM and Success.
4. To authenticate the findings of the survey, it has been followed by a case study in an Indian manufacturing unit.

5. RESULT AND DISCUSSIONS

In this section all the results and the discussions should be made. The surveyed respondents were assessed on various statements based on different parameters. The data was collected from the respondents on four point scale regarding the implementation of various issues i.e. not at all, to some extent, reasonably well and to a great extent. The following tables discuss the distribution of response in percentages obtained from the surveyed respondents on all statements.

5.1 Correlation Analysis

Correlation analysis was performed in this section, the purpose was to identify the relationship between each statements within input and output parameters. Moreover, the direction of perception was measured by using correlation by assessing statements as all were measured on the same scale. The correlation process was Karl Pearson Correlation with significances level 0.05.

The purpose of above correlation matrix was to establish the relationship and its direction between different parameters of the organizations. The hypothesis was also framed for the significances of the relationship between the parameters at 0.05 levels of significances.

5.2 Regression Analysis

Multiple linear regression model was applied in this section to develop the mathematical model in between the dependent variable as all process of output and independent variable as all the parameters of the manufacturing competencies and strategic success. The mathematical model develop were each unique for all the process of the output. ANOVA analysis was also performed for the significances of the regression model and the significances of the independent parameters were identified with the t test for the regression coefficients.

Table 1 Regression Analysis (Productivity)

	Un Standardized Coefficients		Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.186	.270		4.495	.000
I2	.021	.037	.096	.550	.583
I3	-.010	.037	-.061	-.270	.788
I4	-.005	.027	-.033	-.197	.845
I5	.122	.053	.520	2.279	.025
I6	-.043	.044	-.198	-.982	.328
I7	.111	.037	.521	3.009	.003
I8	.095	.031	.405	3.081	.003
I9	-.041	.025	-.252	-1.629	.106
I10	-.005	.036	-.033	-.133	.894
I11	-.097	.051	-.307	-1.911	.059

The following were the regression outputs for the dependent variable Productivity and all rest input parameters as independent variable. The predictors identified from the analysis was improved production, managing tools, equipment and materials, employee respecting scm, management listening to employees, mutual understanding leads to positive results. Efficient working helps in achieving positive results, motivation and support from top management and team leader affects the performance.

Table 2. Regression Analysis (Profit)

	Un Standardized Coefficients		Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.901	.292		3.088	.003
I1	.049	.041	.204	1.220	.225
I3	.075	.040	.409	1.882	.063
I4	-.099	.029	-.548	-3.427	.001
I5	-.013	.058	-.049	-.221	.825

I6	-.086	.047	-.352	-1.818	.072
I7	.130	.040	.541	3.256	.002
I8	.072	.033	.272	2.153	.034
I9	.031	.028	.168	1.129	.262
I10	.052	.039	.317	1.337	.184
I11	-.033	.055	-.091	-.591	.555

The following were the regression outputs for the dependent variable Productivity and all rest input parameters as independent variable. The predictors identified from the analysis was improved production, managing tools, equipment and materials, employee respecting scm, management listening to employees, mutual understanding leads to positive results. Efficient working helps in achieving positive results, motivation and support from top management and team leader affects the performance.

Comparison

Pair wise comparison is an important stage in AHP for determining priority values of attributes and provides a relative rating for alternatives.

A measurement scale provides the relative importance of each factor by providing numerical judgments corresponding to verbal ones. This scale is a discrete one and ranges from 1 to 9 with 9 shows the highest importance of one factor over other and 1 describing equal importance among two factors as shown in table 3.

Table 3: Comparison scale

Intensity	Definition	Explanation
1	Equal Importance	Two factors contribute equally to the objective
3	Moderately More Important	Experience and judgment favour one factor over another
5	Strongly More Important	Experience and judgment strongly favour one factor over another
7	Very Strongly More Important	An factor is strongly favoured and its dominance demonstrated in practice
9	Extremely More Important	The evidence of favouring one factor over another is of the highest possible order of affirmation
2, 4, 6, 8: intermediate values when compromise is needed		

Analysis in AHP is done by squaring the pair wise matrix and then squaring till the eigenvectors calculated are same.

The resulting weights for the criteria based on above pair-wise comparisons are given in table 4.

Table 4. Priority

Category		Priority	Rank
1	I1	17.20%	2
2	I2	8.70%	6
3	I3	8.80%	5
4	I4	5.60%	8
5	I5	19.80%	1
6	I6	10.60%	4
7	I7	6.50%	7
8	I8	12.60%	3
9	I9	3.90%	9
10	I10	3.00%	11
11	I11	3.30%	10

The compromise solution is a feasible solution that is the closest to the ideal solution, and a compromise means an agreement established by mutual concession. The compromise solution method, also known as (VIKOR) the *VlseKriterijumska Optimizacija I Kompromisno Resenje* in Serbian, which means multi criteria optimization (MCO) and compromise solution, introduced as one applicable technique to implement within MADM.

6. CONCLUSION

The research conclusions that the attributes of Strategic Potential of SCM on the Indian manufacturing industries in order to enhance performance. The study also critically examines the SCM factors affecting the strategic success of these organizations. Moreover, the study illustrates the relationship of SCM and strategic success factors in Indian manufacturing industries to have overall business performance. The research critically examines the impact of SCM on strategy formation and thus organization's success. Finally, the research culminates with development of a SCM model for Indian Automobile Industry for sustained strategic success. This study is a legitimate reaction to a developing need of both academicians and professionals for better comprehension of the relationship of various SCM's and strategic success attributes.

The research provides an insight into exploits of Indian entrepreneurs regarding supply chain management and provides an assessment of prevailing status of Indian

entrepreneurs regarding different SCM's and strategy parameters.

- The analysis of significant attributes transportation of SCM reveal that significantly large number of organizations using warehouse for distribution of material (percent point scored, PPS=70.45), bar code containers (PPS=73.63), delivery time (PPS=75.45).
- The analysis of significant attributes of facilities issues reveals that significantly large number of organizations have an effective shoo floor facilities (PPS=70.45), movement of operators (PPS=76.36), mixed production (PPS= 71.36), manufacturing cell (PPS=75.45).

The future scope of this research is to synthesis strategic success concept and exploring manufacturing competencies for automobile manufacturing organizations, while a similar study can also be conducted in future for other Indian product, process and service industries as well. The work is aimed at developing manufacturing competencies and strategic success model for North Indian automobile and auto parts manufacturing organizations and various manufacturers have been treated alike irrespective of the sector of manufacturing organizations. Another direction for future research is developing area-wise, sector-wise and product-wise competency model for automobile manufacturing industry. Thus, individual case study could be conducted for different areas, products and sectors of manufacturing industry and accordingly the typical methodologies can also be evolved in future.

The four major manufacturing sector industries (automobile, electrical & electronics, machinery and process) have been included in this study. This study has some suggestions, which future researchers could consider.

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