



Exploration & Optimization On Supply Chain Risk Management Strategies In Indian Automobile Industry: using SAP-LAP

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Abstract—Supply chain management has become probably the most talked about factor in modern business. Prices, delivery, quality of products variety and innovation and services are the established aspects on which rivalry among the enterprises is being raised time by time and to confront the competition integrated supply chain is much needed tool. The aim of this study is to present the rapport between firm integration and supply chain orientation and supporting technology as moderating that relationship. Now a days, global speedy transformations have forced on organizations to investigate on risk management in supply chain in order to overcome to their around insecure conditions. Suppliers should produce materials and parts with the best quality and less costs. Identifying and ranking of the effective risks in supply chain is necessary in order to achieve it. In this study, in addition to explanation of non-determinant concept in supply chain, and also the identification of risks supply chain and determining the intensity of their effects, risk management in supply chain has been explained as one of the main managers functions.

Keywords:—Supply Chain Management, Risk in Supply Chain, Decision Making, LAP-SAP.

1. INTRODUCTION

The process of advancement in this regard is described in the way that, at first, organizations were trying to produce the products with better quality and the least costs by standardization and improving their own internal processes in order to increase their competitive power. In the past, the dominant thinking was that the powerful engineering and designing and also harmonious and consistent production operations are the leading factor to access market demands and, as a result, to get more market share and, therefore, the organizations do their best to increase efficiency. In later years, with increasing of diversification in customer's expected patterns, the organizations were concerned with increasing improving of production processes and using further engineering models, most of the industrial managers found that to can flexibility in companies abilities. But parts and materials producers should produce the materials with the best quality and least costs and also products distributors must have a close relation with policies of market development of producers. By such a view point, the supply chain approaches and its management were born (Mentzer. etal).

Most of the companies take different actions like contracting to manufacture diversified productions to have cost advantage and market share. These actions

may be efficient due to the stable conditions. But these actions by itself can effect on supply chain by different kinds of risks. The risks like unsecure economic cycles, regard to more increasing of these actions, the need to study of different methods and strategies for supply chain risk management in the superior companies has also been put to agenda more than before (Sharafati,2009). In this research, besides explanation of the concepts of supply chain, supply chain management, risk and non determination in supply chain, we talk about the existing risks in supply chain and finally, after inquiry of risk models in supply chain, which has been extracted from the best selected model, is analyzed by SAP-LAP.

Supply chain. A supply chain is including all stages which directly or indirectly handle customer's demands. Supply chain consists of all cases relevant logistics network which is including suppliers, manufacturing centers, stores, distribution centers, retailers' s market, raw materials, processing stocks and current final products. In literature study, there is many description of supply chain like: company's establishment so that to prepare the products or services for the market (Douglas and partners,1998). It is including of all stages which are active to make the customer desires directly or indirectly be met and not only consist of producers and suppliers, but also including transports, stores, retailers, and customers themselves (Chopra.et al,2001). The network of facilities and distributors which prepare the materials, changing them to semi - manufactured and final productions and distribution of them between customers (Goneshan. et al,1995). On the basis of a given definition from Logistic Management Association, logistic means: planning process, effective execution and control of flow and saving raw materials, materials in production process, finished goods and all information regarding to inventory from place of production till

using point in order to supply consumer's needs. In another definition, logistic is a part of supply chain process which plans, performs and controls the effective and efficient flow of goods storage, services and data relating to them from start point to consumption point, for meeting customer's needs (Erich Nickel,2004).

Supply chain management. Supply chain management is a synthesis from art and science which improve the method of finding company's needed raw materials for production or services. Five main parts of supply chain management are as follows:

- Program.
- Finding selected supplier.
- Fabrication.
- Delivery.
- Rejected.

Risk management. Risk management means recognition, analysis and economical control of risks or probability of risks which can threat properties and economical incomes of companies. On the other hand, risk management is the same system which is planned to order the confronting operations against indetermination and probable deviation (Fathi.et al, 2004).

2. SUPPLY CHAIN RISKS

Financial risk. It is a kind of risk which indicates that the organization has no enough money to face to its financial consequences. If the organization uses from a loan or credits, should be able to pay it back in due time, otherwise it will face to financial risk (Shenkir,2007).

Strategic risk. Strategic risk means the profit at the present and in the future of organization. This kind of risk is subject strategic risk will appear (Brannan,2007).

Operational risk. Nowadays, organizations are trying to upgrade the techniques for measurement, monitoring and decreasing

of operational risks. For example: the results getting from unsuccessful processes or a few equipment, inefficient employees and systems in external accidents, damages are brought about from processes, improper personnel and defective systems or accidents due to the companies outside factors are those to be mentioned. (Litov.et al,2005).

Human resources risk. There are two kinds of human resources risks:

1. The absence of trained persons in order to apply management programs.
2. The important necessary strategy section to connect with risks is the intelligence of those who have to deal with unexpected accidents (Erven,2007).

Technological risk. Informational systems and organizational activities, automation, projects rebate, misunderstanding of share holder's role and technology's position are parts of technological risks. These risks should be recognized earlier, and a set of activities to avoid the serious problems proceeding from them be considered later on (Adams.et al, 2005).

Fame risk. Fame risk has been described as a current or future risk for earning and increasing capital from different viewpoints of financial firms and commercial beneficiaries. The duty of all employees is to keep organization fame (Fiorino, 1989).

Laws risk. At any environment which is changeable, these controlling laws can give confidence regarding the fact that identification, management and control of any kind of controlling risks, now and in the future will be done. Control teams on laws are including controlling experiences and especial risks management. Not only they know laws, but have also trained for contrasting, executing and accessing to

risks (Brannan, 2007). There are some different kinds of models in supply chain in order to manage the risks which can point to some of them, like FM Global models, Marine Swanson and partners, Nick Edwards and partners, and our suggestive model.

3. RISK MODELS IN SUPPLY CHAIN

FM Global model. In this model, risk factors divide to four branches for reflecting different risks which may arising from confusion in supply chain.

Environmental. This kind of risk especially concerns to economical, social, governmental and climate factors. Recently, in spite of no lack in above mentioned items, some societies were faced to earthquakes, terrorist attacks and tsunamis.

Market effects. Is your supplier's reflex in pressure terms? If not, the disorders between products supply and your supply chain can have destruction effect on your final line. And what kind of information your suppliers have from their suppliers about market reflex? Their presentation can be your presentation.

Business activities. Financial and managerial stability of suppliers should be attended more than internal processes and governmental organizations experiences for their representing risk.

Physical installation. Losing dimensions is as much important for organization suppliers as . Some points like natural risks, structural materials, automatic sprinkler keeper and popular attraction in losing protection indicator are usually ignored. However, these may be the most important probable factors relating to defeated scenario.

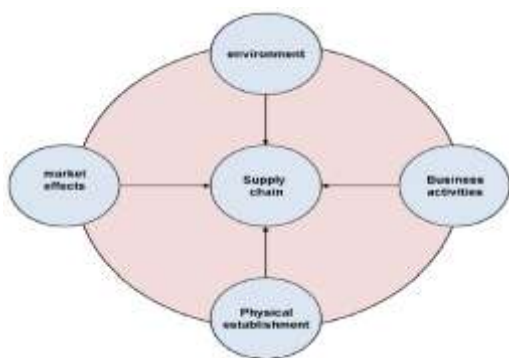


Figure 1: Fm Global Factory Model

SAP-LAP. A (SAP-LAP) model of a flexible system is proposed by Sushil (2000). For the systemic inquiry of coordination issues in supply chain and the adoption of coordination mechanisms by supply chain members the same framework can be used. The respective terms in SAP-LAP are explained below.

SAP-LAP is an integrative framework comprising of six basic components:

- The ‘Situation’ to be deal with, which can be external or internal to the organization.
- The ‘Actor(s)’ dealing with the situation, which can be ‘internal’ or ‘external’ with reference to the organization under study.
- The ‘Process (es)’ dealing with the situation, which can again be ‘internal’ or ‘external’ to the organization.
- The key learning issues, in terms of the achievement of objectives or problem areas.
- The ‘action (s)’ to be taken based on learning, affecting the performance areas or objectives.
- The ‘performance’ areas in terms of ‘objectives’ to be achieved or key result areas (KRAs).

The worldwide market for supply chain management (SCM) software is expected to grow by 8.5% per year for the next five years, according to a study by ARC Advisory Group. The market was \$5.5 billion in 2005, and ARC predicts it will reach \$8.3 billion in 2010. In 2008, SAP now holds 22.4% of the supply chain management (SCM) market, totaling \$1.3 billion in revenue, up from 20% last year. Oracle holds 16%, totaling \$955 million in revenue, up from 15% last year.

4. METHODOLOGY

A SAP-LAP model should be developed by framing critical questions about the situation, actor, process, learning, action, and performance. The SAP-LAP model enquires about what is happening in the situation, what are the relevant characteristics of the actor that relate it with the situation as well as process, and what is to be questioned about the process. Further, it enquires into the major areas of learning, key fronts of suggested actions, and their implications on the performance (Sushil, 2000). The situation is treated like a journey and examines the past, present, and the expected trends in future. For the various actors under consideration, it inquires about their worldviews, roles and capabilities, and their respective freedom of choice. The process is examined in terms of three seminal questions, i.e. what, why, and how? The basic purpose of the process is questioned and then the questions are asked to generate the alternatives (Sushil, 2000). The LAP is carried out for situation, actor, and process independently leading to a synthesis. The key learning issues about the SAP are to be identified synthesizing into overall learning issues. This will lead to key suggested actions to improve the situation, actor and process respectively. Finally, the impacts of these actions on the performance of the situation, actor, and process are explored (Sushil, 2000, 2001).

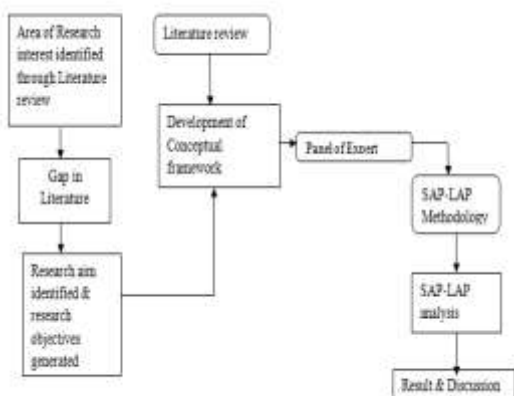


Figure 2: Algorithm of Research Methodology

5. ANALYSIS & RESULTS.

The simplest form to depict interrelationship of elements can be used in the form of a matrix, having two dimensions. The basic matrices in SAP-LAP linkages taken are self-interaction and cross-interaction matrices **SAP-LAP Model**.

Though there is one-to-one correspondence between matrices and structural models, the structural graphics is advantageous to read and interpret as compared to large matrices. However, the graphical structural model, in the context of cross-interaction of two different sets of elements becomes at times complicated to be read by the user. Since there is one-to-one correspondence between matrices and structural models, the graphical models can easily be portrayed by using the data in matrices. As the paper is the first attempt to include interrelationships of SAP-LAP elements, it is preferred to use matrices rather than graphical representations.

External and Internal Drivers for Situation

Key	SITUATION
S1	Customer demand
S2	Manufacturing process
S3	Location
S4	Government policy
S5	Competitor
S6	Transparency
S7	Responsiveness
S8	Coordination

Simple Interaction (Binary Matrix) Matrix for Situation

Situation	S8	S7	S6	S5	S4	S3	S2	S1
S1	1	1	1	1	0	1	1	1
S2	1	0	0	1	0	0	1	
S3	0	0	0	1	1	1		
S4	0	0	0	0	1			
S5	0	1	0	1				
S6	1	1	1					
S7	1	1						
S8	1							

Interpositive Matrix for Situation

Situation	S1	S7	S6	S5	S4	S3	S2	S1
S1	High productivity	Higher reliability	Long term relationship	Policy making	0	Logistics System	New Technologies	1
S2	Business development	0	0	Sustainability	0	0	1	
S3	0	0	0	Sustainability	Indifferent regulatory law	1		
S4	0	0	0	0	1			
S5	0	Customer satisfaction	0	1				
S6	High productivity	Support	1					
S7	Adaptation	1						
S8	1							

External and Internal Drivers for Actor

Drivers for the Actor	
Key	Actors
A1	Employees
A2	Management
A3	Information sharing
A4	Openness
A5	Work place
A6	Flexibility
A7	Coordination
A8	Behavioral –aspects
A9	Technical skills

External and Internal Drivers for Process

Drivers for the Process	
Key	Process
P1	Self assessed measurement
P2	Standardization
P3	Learning organization
P4	Innovation and change
P5	Motivation
P6	Feedback
P7	Regulation(laws)
P8	New technologies
P9	Labor and raw material
P10	Business development

Simple Interaction (Binary Matrix) Matrix for Actor

Acto rs	A9	A8	A7	A6	A5	A4	A3	A2	A1
A1	1	1	1	0	1	0	1	1	1
A2	1	1	1	1	0	1	1	1	
A3	1	0	1	0	0	1	1		
A4	0	1	1	0	0	1			
A5	1	0	0	0	1				
A6	1	0	1	1					
A7	1	1	1						
A8	1	1							
A9	1								

Simple Interaction Matrix for Actor										
Process	P10	P9	P8	P7	P6	P5	P4	P3	P2	P1
P1	0	1	0	0	1	1	1	1	1	1
P2	1	1	1	0	1	0	1	1	1	
P3	1	0	1	0	1	0	1	1		
P4	1	0	1	1	0	0	1			
P5	0	0	0	0	1	1				
P6	1	0	1	0	1					
P7	1	1	1	1						
P8	0	0	1							
P9	0	1								
P10	1									

6. CONCLUSION

The comprehensive effort put into the work can be conventionally categorized into the literature survey and its analysis in formal and non formal context which include definition, classification and to examine the managerial concern about the internal Supply Chain Management.

The proposed inclusive framework of SAP-LAP model is presented to capture the whole Scenario of coordination to exploring the performance level of internal supply chain in the manufacturing industry. It is based on the three key entities, viz.

Interpreting Matrix for Actor									
Acto rs	A9	A8	A7	A6	A5	A4	A3	A2	A1
A1	Quality	Long term relationship	Timeliness	0	Physical comfort	0	Timeliness	Motivation	1
A2	Quality	Long term relationship	Support	Policy making	0	Productivity	Policy making	1	
A3	Satisfaction	0	Business development	0	0	Customer satisfaction	1		
A4	0	Adaptation	Sustainability	0	0	1			
A5	High productivity	0	0	0	1				
A6	Support	0	Policy making	1					
A7	Productivity	Business development	1						
A8	Long term relationship	1							
A9	1								

situation, actor and process and takes the learning centered synthesis in terms of learning, action and performance. The framework helps in identifying different coordination issues based on the relative importance of using internal supply chain in the manufacturing industry. The actors of XYZ may demand more freedom of choice to change the present concept of coordination in a more flexible way. The XYZ actors may share values, knowledge, information and willingness with other actors at intra-departmental (between various business processes of XYZ) and inter-departmental (amongst different members of the chain) level. The changing dynamic situation demands changes in the processes of XYZ. The processes of designing, procuring components, manufacturing and distributing, may change when actors adopt different coordination mechanisms (like information sharing, joint decision-making, meetings, information technologies, and supply chain contracts). In the proposed SAP-LAP framework the different issues discussed are coordination with supplier, coordination with buyer, information sharing, information system, coordination initiatives, and flexibility required to coordinate with members to the managerial concern about the internal Supply Chain Management. SAP-LAP framework has helped in understanding various coordination issues related to the downstream and upstream of the internal supply chain of XYZ manufacturing company. The customer's demands cannot be fulfilled because of lack of communication. There is insufficient professionals are in work as only 70 percent workers possess desired academic qualification for their concerned work. Around 30 percent members (working personnel) are giving their services in SCM but not that much of accustomed to new trends of SCM. The present system of coordination relies on one to one or group correspondence, conversation on telecom etc. however; neither internet nor intranet

has been brought into use. The research leads company to proper handling and thorough knowledge of SCM implementation. Since the company chosen for this research work is in learning stage, this thesis allows the relevant, correct and timely information. There by, the employees show their dedication to their work and their expectation from the company is being come true.

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