

Risk Evaluation and Management Involved in Supply Chain

Pulkit Gautam¹, Dr Deepti Gupta², Sachin Chaudhary³

¹Research Scholar, SVU, Gajraula, ²Research Supervisor, ³IIMT University, Meerut

ABSTRACT

In today's globally connected economy, supply chains need to be managed effectively for businesses to achieve profitability. However, there are several potential risks involved in supply chain management that can have a negative effect on how well the supply chain operates in general. The purpose of this research paper is to present a thorough overview of the literature on supply chain management risks and to study the improvements of supply chain performance in terms of cost, customer satisfaction and delivery time. The study identifies, explores, and offers a framework for comprehending and managing the various types of risks associated with supply chain management. The first step deals with identifying, estimating, and evaluating risks. The identification of potential supply chain risk events will be made possible by the proper execution of all steps in this procedure. The second step involves mitigating and monitoring risks involved in supply chain. Risk management enables the decision-maker to comprehend and evaluate the effect of risk on a supply chain network.

Supply chains should always stay on top of inventory to improve its cost efficiency. Customer satisfaction can be increased by using online tracking system because it makes it easy for them to track inventory and enhance the visibility. Delivery time can be improved by solving the issue of lack of resources. Supply chain management is essential for businesses working in a globalised market. However, it is also prone to a number of risks that might affect how well the entire supply chain functions. However, by strengthening the supply chain resilience, creating backup plans, and working with suppliers and

clients, businesses may manage these risks. In this paper, we showed that by improving cost efficiency, delivery time and customer satisfaction we can improve the performance of supply chain. Businesses may reduce the damaging effects of supply chain risks and maintain the efficient operation of their supply chains by putting these methods into exercise.

Introduction

Supply Chain Management (SCM) is the management of materials, information, and financial flows throughout a network of suppliers, distributors, manufacturers, and customers. Supply chain management is crucial for an organization's success since it can have a significant impact on its overall performance and competitiveness. SCM management entails the coordination and integration of every procedure related to sourcing, conversion, procurement, and logistics management. "Risk" was less dispersed and easier to manage when enterprises produced on-site, made local purchases, and sold to the customer directly. Risk is increasing as a result of increased product/service complexity and the outsourcing of supply networks across international borders, and through complex and dynamic supply networks, risk placement has changed.

Supply chain management has always had to deal with a lot of risk and uncertainty. According to Faisal et al. (2006b) and Tang (2006a), businesses today require excellent supply chain risk management (SCRM). Ericsson (Norrman and Jansson, 2004) and Nokia (Li et al, 2006) have long recognised the importance of effective risk

management in their supply chain operations. Controlling and incorporating crucial informational components into the supply chain had an effect on how well it operated, according to Gunasekaran and Ngai (2004) and Sufian (2010). According to Handfield and Nichols, 1999 and Sufian (2010) – “The industries must adopt information technology to accomplish successful supply chain integration”. According to Brandyberry et al. (1999), businesses might control the flow and effects of several supply chain dimensions, including quality, cost, delivery, adaptability, and revenue, by utilising information technology. Byrd and Davidson (2003) discovered that information technology has an impact on the efficiency of the supply chain. They claimed that the advancement and sustained application of information technology result in improved firm performance in terms of return on equity (ROI), return on investment (ROI), and market share.

Demand forecasting, inventory management, logistics and transportation planning, supplier management, and quality control are just a few of the numerous processes that are included. To create a supply chain that is efficient and optimal, these activities must be effectively coordinated and collaborated. In order to increase supply chain visibility, traceability, and control, SCM management also makes use of cutting-edge technology including enterprise resource planning (ERP) systems, digital platforms, and advanced analytics. A successful supply chain management strategy can result in lower costs, better productivity, and higher customer satisfaction.

In recent years, the global supply chain has grown more intricate and linked, increasing its vulnerability to numerous threats. These threats can come from a variety of things, including cyberattacks, economic downturns, political unrest, and natural disasters. Effective risk evaluation and management has now emerged as a crucial component of supply chain management. This paper aims to look at the various hazards that businesses may encounter in their supply chains as

well as the strategies they may employ to reduce and manage such risks.

Cost reduction strategies in Supply Chain Management

There are 4 cost reduction strategies in supply chain management.

1. Stay on Top of Inventory

One of the main causes of high supply chain management costs is inventory loss. Every object you miss or lose because of damage or spoiling prevents you from completing orders or satisfying demand.

You can significantly reduce those costs by monitoring your stock and by maintaining track of every item you are storing. Better yet, you'll be able to spot patterns that are causing loss or wasted goods so you can start making the required adjustments and cutting costs.

2. Hire the right Employees

Your supply chain management efforts may be sped up or slowed down by your workers. You'll have a more cost-effective supply chain if they are effective and promptly handle orders. The key is to select staff members who converse and keep you informed of any changes or problems as they arise.

3. Manage Shipping and Transportation Goods

One of the biggest and most expensive challenges your warehouse will encounter is getting products to the final customer. Looking closely at how you presently deliver orders is essential if you want to figure out how to lower transportation costs in the supply chain.

It will cost more to process everything through internal agencies. Instead, think about reducing frequency and combining

shipments into bigger orders. If that is not a possibility, it might be wise to hire specialized transportation firms to handle the work for you.

This will cut down on your operating expenses. Even better, you will not have to deal with the hassle or cost of employing more full-time employees to help keep up with customer demand.

4. Embrace Automation

It takes time to do things like monitor inventory, prepare orders, and analyze data. Your workers could use that time to work on other projects for your company. You can free up employees to concentrate on their primary responsibilities by automating some processes.

with useful details about when products are ordered and shipped. Also, improving supply chain visibility is essential for ensuring customer happiness.

3. Increasing speed-to-delivery with on-demand fulfilment

Businesses may quickly expand operations without making substantial investments thanks to on-demand fulfilment, which enables them to pop-up fulfilment facilities when and where they are needed.

4. Satisfying customer demand with an agile inventory strategy

Retailers are constantly trying to strike the right balance between surplus inventory and out-of-stock goods. Agility enables supply chain partners to coordinate to manufacture the amount of product required daily, rather than quarterly, monthly, or yearly estimates.

Ways to improve Customer Satisfaction

There are 4 ways by which we can improve customer satisfaction in a supply chain.

1. Improving On-Time Delivery

If you make a delivery commitment to your clients, it is essential to keep that promise and the standards you have established with them in order to promote repeat sales.

2. Using technology to enhance visibility and track inventory

Warehouse management systems (WMS) systems offer advantages that go beyond automation. A WMS improves efficiency and reduces error-proneness in a warehouse while also providing better facility management visibility.

When used in conjunction with your WMS, order tracking systems increase transparency, boost customer happiness, and give vital information for organisations. Customers may track their online orders, and it also provides users

Ways to improve On-Time Delivery

There are 6 ways to improve on-time delivery in supply chain management:

1. Discuss Strategy with Employees
2. Set Realistic On-Time Delivery Goals
3. Streamline Picking
4. Improve Inventory Management
5. Utilise Route Management Software
6. Be Flexible with Your Resources

Literature Review

Supply networks have become more complex and dynamic as a result of outsourcing, globalisation, and the complexity of products and services, which has increased the factors affecting risk exposure. The review demonstrates several risk types and their categorizations based on various categories that have an impact on supply chain operations.

According to Blackhurst et al. in 2005 - "The scale and rate of risk events in supply network are increasing".

According to Hendricks and Singhal in 2003, 2009 - "Disruptions determine the robustness of SCM in a company".

According to Sheffi and Rice in 2005 - Disruption events are described as when "the tornado hits, the bomb explodes, a supplier goes out of business, or the union begins a wildcat strike".

Various authors' risk classifications can be expanded to incorporate the scale and risk occurrence. Parameters for categorising risks in SCM include: (i) based on risk sources and mitigation techniques (Chopra and Sodhi 2004); (ii) as organisational, environmental, and network risks (Jüttner et al. 2010); (iii) demand and supply risks (Manuj and Mentzer 2008); (iv) industry and organisational risks (Rao and Goldsby 2009); and (v) network risks (Garvey et al. 2015).

Objectives

To study the improvements of supply chain performance in terms of cost, customer satisfaction and delivery time.

Hypothesis

1. How to improve cost efficiency in supply chain?
2. How to improve customer satisfaction in supply chain?
3. How to improve delivery time in supply chain?

Research Methodology

Two categories can be used to classify the risk evaluation and management in supply chain process: risk evaluation and risk control. While risk control focuses on mitigating and monitoring risks, risk evaluation focuses on identifying, estimating, and evaluating risks.

The first step deals with identifying, estimating, and evaluating risks. The identification of

potential supply chain risk events will be made possible by the proper execution of all steps in this procedure.

- Identify Risks: Make a list of all possible supply-chain risks, including disruptions at suppliers, natural disasters, transportation problems, and product recalls.
- Assess Risk Probability: Estimate the probability that each risk will occur based on past data and market patterns.
- Evaluate Risk Impact: Consider the operational, financial, and reputational consequences of each risk while evaluating its impact.
- Analyse Interdependent Risks: Analyse how different risks may interact and compound each other, as interdependent risks can result in a much greater impact than individual risks.
- Prioritize Risks: Give the highest priority to the risks that have the greatest potential for effect and probability.

The second step involves mitigating and monitoring risks involved in supply chain. Another term for risk management is a coordinated set of actions and strategies that guide a company to reduce the risk involved in attaining its objectives. Risk management enables the decision-maker to comprehend and evaluate the effect of risk on a supply chain network.

- Create measures to reduce each risk, such as diversifying suppliers, putting emergency plans in place, and investing in risk management technologies.
- Monitor and review: Keep an eye out for new risks in the supply chain and evaluate how well risk-reduction measures are working.
- Update techniques: As risks and circumstances change, risk management techniques should be updated accordingly.
- To reduce supply chain interruptions, provide excellent communication among

This table describes a clear picture of the study sample. It shows that 58% respondents of the sample were male while 42% respondents of the sample were female.

Age of respondent's

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid less than 25	16	32.0	32.0	32.0
26-35	14	28.0	28.0	60.0
36-45	7	14.0	14.0	74.0
46-55	7	14.0	14.0	88.0
56&above	6	12.0	12.0	100.0
Total	50	100.0	100.0	

all stakeholders, including suppliers, clients, and logistical partners.

DATA ANALYSIS AND INTERPRITATION

Above table describes a clear picture about the respondents' age group of the study sample. It is visible from the table that that 32% of the total respondents belonged to less than 25 years age group while 28% of the total respondents belonged to 26 years to 35 years age group respondents and 14% respondents belonged to 36 to 45 years of age group and 14% respondents

belonged to the age group of people who are 46 to 55 years and 12% of the total respondents belonged to 56 years and above.

In this table question- "Does managing shipping and transport cost improves cost efficiency"- shows 10% respondents disagree, 18% people show neutral and 52% respondents strongly agree because they assume that managing shipping and transport cost improves cost efficiency.

In this table question – "Does over automation effect cost efficiency"-shows 6% respondents strongly disagree, 12% respondents show neutral and 58% strongly agree because they assume that over automation effects cost efficiency.

In this table question- "Do you think hire the trained employees improves cost efficiency in supply chain"-shows 8% respondents strongly disagree, 14% people show neutral and 52% respondents strongly agree because they assume that by hiring trained employees cost efficiency in supply chain can be improved.

In this table question- "does stay on top of inventory helps in improving cost efficiency in supply chain"-shows 8% of respondents strongly disagree, 14% people show neutral and 54% strongly agree because they think that staying on top of inventory helps in improving cost efficiency.

From the above table -we can say that managing shipping and transport cost improves cost efficiency in supply chain by the highest average of 2.0800 and stay on top of inventory effects cost efficiency by the lowest average of 1.9600.

Q2-How to improve customer satisfaction in supply chain?

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Delivery promises complete on time	50	1.00	5.00	1.7200	1.29426
Use IT to enhance visibility and track inventory	50	1.00	5.00	1.6000	.96890
Increase speed-to-delivery with on-demand fulfilment on occasion of festival season	50	1.00	5.00	2.0800	1.24278
Satisfy customer demand with an agile inventory strategy	50	1.00	5.00	2.0200	1.37752
Valid N (listwise)	50				

In this table question- “Do you think that delivery promises complete on time provide customer

satisfaction”-shows 4% respondents strongly disagree,16% people agree and 68% strongly agree because they think that completing delivery promises on time provide satisfaction to customers.

In this table question- “Use IT to enhance visibility and track inventory “-shows 4% respondents are disagree,10% are showing neutral responses and 62% respondents are strongly disagree because they think that using IT can

Descriptive analysis of the objectives

Q1-How to improve cost efficiency in supply chain?

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Manage shipping and transport cost	50	1.00	5.00	2.0800	1.36785
Over automation effect cost efficiency	50	1.00	5.00	1.9600	1.36964
Hire the trained employees	50	1.00	5.00	2.0200	1.31692
Stay on top of Inventory	50	1.00	5.00	1.9600	1.29300
Valid N (listwise)	50				

enhance visibility and track inventory thus it helps in satisfying customers in supply chain.

In this table question- “Do you think that by increasing speed-to-delivery with on-demand fulfilment on occasion of festival season provides customer satisfaction”-8% respondents disagree,7% respondent’s shows neutral and 42%

strongly agree that increasing speed- to – delivery with on-demand fulfilment on occasion of festival season provides customer satisfaction.

In this table question- “Do you think satisfy customer demand with an agile inventory strategy helps in customer satisfaction”-shows 8% respondents disagree,10% shows neutral and 54% strongly agree because they assume that satisfy customer demand with an agile inventory strategy helps in customer satisfaction.

From the above table-we can see that increase speed-to-delivery with on-demand fulfilment on occasion of festival season provides customer satisfaction by the highest average of 2.0800 and use IT to enhance visibility and track inventory by the lowest average of 1.6000.

Q3-How to improve delivery time in supply chain

Descriptive Statistics

	N	Mini mum	Maxi mum	Mea n	Std. Deviati on
Inventory management issues	50	1.00	5.00	2.0800	1.33768
Lack of Resources	50	1.00	5.00	1.9800	1.30133
Order fulfilment issues	50	1.00	5.00	2.0800	1.41190

Supplier Delays	50	1.00	5.00	2.0200	1.26958
Valid N (listwise)	50				

In this table question- “Do you think that solving lack of resources issues delivery time can be improved”-8% respondents show strongly disagree,10% people show neutral and 52% strongly agree because they assume that resolving lack of resources issues improves delivery time.

In this table question- “Do you think that resolving order fulfilment issues improves delivery time”-shows that 10% respondents strongly disagree ,12% people show neutral and 54% respondents strongly agree because they assume that by solving order fulfilment issues delivery time can be improved.

In this table question- “Do you think that supplier delays increase delivery time”-8% respondents are disagreed,14% respondents shown neutral and 48% people are strongly agree because they assume that supplier delays increase delivery time.

From the table – we can see that by solving inventory management issues supply chains can improve delivery time by the highest average of 2.0800 and by solving lack of resources issues delivery time can be improved by the lowest average of 1.9800.

Suggestions of the study

1. Supply chains should always stay on top of inventory to improve its cost efficiency.
2. Customer satisfaction can be increased by using online tracking system because it makes it easy for them to track inventory and enhance the visibility.
3. Delivery time can be improved by solving the issue of lack of resources.

CONCLUSION

Supply chain management is essential for businesses working in a globalised market. However, it is also prone to a number of risks that might affect how well the entire supply chain functions. However, by strengthening the supply chain's resilience, creating backup plans, and working with suppliers and clients, businesses may manage these risks. In this paper, we showed that by improving cost efficiency, delivery time and customer satisfaction we can improve the performance of supply chain. Businesses may reduce the damaging effects of supply chain risks and maintain the efficient operation of their supply chains by putting these methods into exercise.

REFERENCES

- [1] Global Journal of Researches in Engineering: G Industrial Engineering, 2014. Faizal. K & Dr. PL. K. Palaniappan.
- [2] 2012 Published by Elsevier Ltd. Selection and/or peer-review under responsibility of the Asia Pacific Business Innovation and Technology Management Society.
DOI: 10.1016/j.sbspro.2012.03.185
- [3] Int'l Journal of Information Systems and Supply Chain Management, 2(1), 16-33, January-March 2009
- [4] The Author(s) 2021, Annals of Operations Research (2022), Risk management methodology in the supply chain: a case study applied by M. J. Hermoso-Orzáez and J. Garzón-Moreno.
<https://doi.org/10.1007/s10479-021-04220-y>
- [5] Gurtu, A.; Johny, J. Supply Chain Risk Management: Literature Review. Risks 2021, 9, 16. <https://doi.org/10.3390/risks9010016>
- [6] <https://www.locate2u.com/articles/on-time-delivery/>

[7] <https://www.flexe.com/articles/4-supply-chain-secrets-to-drive-customer-satisfaction>

[8] <https://www.avetta.com/blog/4-key-cost-reduction-strategies-supply-chain-management>