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A Study on the Role of Technology in Supply Chain Management

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ABSTRACT: Supply Chain Management (SCM) is pivotal for businesses in the modern global economy. It involves managing a network of interconnected activities, organizations, and resources to deliver products and services to customers efficiently. SCM spans sourcing, production, logistics, inventory management, and distribution, with the goal of minimizing costs and maximizing value. As businesses expand globally, supply chains have become more complex, necessitating the integration of advanced technologies for enhanced visibility, operational optimization, and real-time decision-making. The objectives of the study is to analyse the role of Technology in Supply Chain Management. The sample of the study is 97. Descriptive research design and convenience sampling method has been used. Questionnaire has been used as a primary data. Simple percentage analysis, chi-square analysis and anova statistical tools have been applied to reach the findings of the study. It is found that 70.1% respondents are belonging to the age group of below 25 years. It is suggested that there is no significant association between age of the respondents and manufacturing. It is concluded that technology is reshaping the landscape of Supply Chain Management, ushering in a new era of efficiency, agility, and sustainability. Embracing technology adoption is not only a strategic necessity but a catalyst for future growth and success. Organizations that harness the power of technology-driven SCM will be better equipped to navigate the complexities of the global market and meet the ever-changing demands of customers, ensuring their position as industry leaders in the years to come.

KEYWORDS: Technology, supply chain management, Digitalization, Automation, Integration and Efficiency.

I. INTRODUCTION

Supply Chain Management (SCM) is pivotal for businesses in the modern global economy. It involves managing a network of interconnected activities, organizations, and resources to deliver products and services to customers efficiently. SCM spans sourcing, production, logistics, inventory management, and distribution, with the goal of minimizing costs and maximizing value. As businesses expand globally, supply chains have become more complex, necessitating the integration of advanced technologies for enhanced visibility, operational optimization, and real-time decision-making (Chopra & Meindl, 2021). Supply chain management (SCM) is the management of the flow of goods and services. It includes the movement and storage of raw materials, work-in-process inventory, and finished goods from point of origin to point of consumption. Interconnected or interlinked networks, channels and node businesses are involved in the provision of products and services required by end customers in a supply chain. SCM has been defined as the "design, planning, execution, control, and monitoring of supply chain activities with the objective of creating net value, building a competitive infrastructure, leveraging worldwide logistics, synchronizing supply with demand and measuring performance globally.



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Objectives of the Study

The study is designed with the following specific objectives:

- To know the impact of technology adoption in Supply Chain Management.
- To identify the current difficulties in implementing these strategies.
- To find out focus the concept of demand forecasting and material resource planning.
- To compare and contrast the important the factors or Manufacturing.
- To recommend suitable steps for better functioning of the organization.

II. REVIEW OF LITERATURE

Rajeev Kumar (2024), “Performance Measurement in Dairy Supply Chain Management”. Measurement of the performance of entire dairy supply chains is an important issue because it allows for “tracking and tracing” of efficacy and efficiency failures and leads to more informed decision making with regard to chain design. However, the choice of appropriate supply chain performance indicators is rather complicated due to the presence of multiple inputs and multiple outputs in the system. Therefore, this paper aims to evaluate the usefulness of a novel conceptual model for supply chain performance measurement in a dairy supply chain. A conceptual model for integrated supply chain performance measurement is proposed in a dairy supply chain by means of an extensive literature review. The proposed conceptual framework is found to be useful for measuring performance of the dairy supply chain. From the literature review it is concluded that four main categories of performance measures (i.e. efficiency, flexibility, responsiveness, and food quality) are identified as key performance components of the dairy supply chain performance measurement system. This research evaluates a novel concept for measuring the performance of dairy supply chains.

NorlindaMohdRozar and Wan Hasrulnizam Wan Mahmood (2025), “A Study of Success Factors in Green Supply Chain Management in Manufacturing Industries in Malaysia”. Environmental issues have become a notably prevalent concern for governments, societies and business organizations. With environmental problems such as global warming, ozone depletion, solid waste and air pollution, business organizations are considered to be the source of most of the environmental problems. In Malaysia, manufacturing industry is one of the main contributors for the economic growth. Unfortunately, it has been caused for environmental deterioration. (DOE, 2013). In order to investigate further understand GSCM among manufacturers in Malaysia, This study has carry out survey to 241 of 522 certified companies MS ISO 14001 in Malaysia is 522 companies. One of the results are consistent with the study of Rao (2007) who found that there is a manufacturing company that cannot sell and distribute raw materials internally to other companies or external use as raw material and subject to confidentiality policies.

Mohammad Safiqul Islam and Mr. Gu Qing Liang (2023), “Supply Chain Management on Apparel Order Process: A Case Study In Bangladesh Garment Industry”. Bangladesh Garment Industry improvement is desired in reducing the Supply time required to produce and fulfill the orders placed by foreign companies. Supply time refers to the time required for supplying ordered garment products after the export order has received. Using modern fast and effective machinery can reduce time taken to deliver the order. The objectives are to analyze apparel supply chain matters such as new orders, raw materials supply, production processes and logistics related to finished goods delivery. We collect data for trade statistics, conducted structured interviews and send survey questionnaires to garment manufacturers. Analysis shows apparel manufacturers are striving for sustainable business growth. We identify related supply chain practices influencing the industry, set guidelines for improvement and offer recommendations for sustainability.

III. RESEARCH METHODOLOGY

The study has been made in a descriptive and analytical research. In the present study, an extensive use of both primary and secondary data was made. Convenience Sampling method was used for collecting the primary data from the respondents. Sample of 97 respondents were taken into study. Percentage analysis, chi square and anova this statistical tools are used in this study.



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Data Analysis and Interpretation

Table No: 1 Age of the respondents

Age	No of respondents	Percentage
Below 25 years	68	70.1
25 - 40 years	29	29.9
Total	97	100.0

(Source: Primary data)

INTERPRETATION

From the above table it is shows that out of 97 respondents, 68 (70.1%) respondents are belonging to the age group of below 25 years and remaining 29 (29.9%) respondents belonging to the age group between 25-40 years. The majority 68 (70.1%) respondents are belonging to the age group of below 25 years.

Table No: 4.2 Gender of the respondents

Gender	No of respondents	Percentage
Male	42	43.3
Female	55	56.7
Total	97	100.0

(Source: Primary data)

INTERPRETATION

The above table 4.2 shows that out of 97 respondents, 42 (43.3%) of the respondents are male and remaining 55 (56.7%) of the respondents are female. The most of the respondents are female.

Table No: 4.3 Chi-Square: Age and Manufacturing

H_0 = There exist no significant association between age of the respondents and Manufacturing.

Age	Manufacturing			Total
	High	Moderate	Low	
Below 25 years	39	12	17	68
25 - 40 years	16	6	7	29
Total	55	18	24	97

Calculated χ^2 Value: 0.125

Degree of freedom: 2

Table Value: Five per cent level: 5.991

INTERPRETATION

Since the calculated χ^2 value (0.125) is less than the table value (5.991) at five percent level of significance. H_0 is accepted. Hence it is concluded that there is no significant association between age of the respondents and manufacturing.



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Table No: 4.4 Chi-Square: Gender and Technology adoption in supply chain management

H_0 = There exist no significant association between gender of the respondents and Technology adoption in supply chain management.

Gender	Technology adoption in supply chain management			Total
	High	Moderate	Low	
Male	22	7	13	42
Female	33	12	10	55
Total	55	19	23	97

Calculated χ^2 Value: 2.204

Degree of freedom: 2

Table Value: Five per cent level: 5.991

INTERPRETATION

Since the calculated χ^2 value (2.204) is less than the table value (5.991) at five percent level of significance. H_0 is accepted. Hence it is concluded that there is no significant association between gender of the respondents and Technology adoption in supply chain management.

Table No: 4.5 Anova Table Showing The Difference In Mean Scores Between Supply Chain Challenges & Status Of The Company

Particulars	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	0.401	2	0.201	0.300	0.741
Within Groups	98.372	94	0.669		
Total	98.773	96			

IV. INTERPRETATION

The above table shows that the P value (0.741) is greater than 0.05. So, there is no significant difference in the mean scores of the respondents based on Supply chain challenges with respect to different status of the company. It is inferred that status of the company does not influence the Supply chain challenges.

Suggestions

- It is suggested that future research should cover not only these industries but other manufacturing and service industry as well.
- Manufacturing and service industries differ widely as service firms depend basically on people to produce and sell their products which are intangible services.
- Therefore, both industries may be different in nature of their supply chain practices with internal and external partners.
- A comparison can be made in terms of supply chain integration practices, operational characteristics of their supply chain and also potential barriers and benefits of SCM in this regards.
- The supply chain management practices involves different parties both internally and externally, and managers from different areas within a firm or from different partnering firms (suppliers and customers) may have different perceptions of their SCM practices.
- Therefore, dyadic or triadic data collection from different parties in a supply chain may generate more significant results by comparing and contrasting the responses from various practices.



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V. CONCLUSION

In today's highly competitive and global economy there is ample evidence that customers are demanding lower prices, better quality, more variety and faster delivery. In order to compete in this environment, it is believed that firms must become more flexible, agile and responsive to the demands of their customers. It is also believed that competition in this global economy will not be company versus company but will be supply chain versus supply chain. As the concept of Supply Chain Management gains popularity and prominence, its focus and objective have broadened from mere production, inventory and logistics to a more strategic pursuit of SCM practices such as, supply chain integration, flexibility, agility and leanness. In conclusion, technology is reshaping the landscape of Supply Chain Management, ushering in a new era of efficiency, agility, and sustainability. Embracing technology adoption is not only a strategic necessity but a catalyst for future growth and success. Organizations that harness the power of technology-driven SCM will be better equipped to navigate the complexities of the global market and meet the ever-changing demands of customers, ensuring their position as industry leaders in the years to come.

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