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DIGITAL TRANSFORMATION IN SUPPLY CHAIN MANAGEMENT

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ABSTRACT:

Digital transformation in supply chain management revolutionizes traditional processes by integrating advanced technologies. The current study explores the profound impact of digitalization on optimizing supply chain efficiency and responsiveness. Leveraging technologies such as IoT, AI, and Blockchain, organizations gain real-time visibility into their supply networks, enhancing decision-making and risk management. Automation streamlines operations, reducing errors and costs. The integration of predictive analytics enables proactive inventory management, minimizing stockouts and overstock situations. Collaborative platforms facilitate seamless communication between stakeholders, fostering a more agile and interconnected supply chain ecosystem. Digital transformation in supply chain management is imperative for business seeking to adapt to the rapidly evolving landscape, ensuring competitiveness, resilience, and enhanced customer satisfaction through faster deliveries and improved order accuracy. Digitalization navigates the complexities of a global supply chain, embracing digital technologies is a strategic imperative for staying competitive in the modern market place. Therefore, current study is focused on digitalization in supply chain management.

KEY WORDS: Digital transformation, supply chain management, technologies, IoT, AI.

INTRODUCTION :

Digital transformation has become a significant driver of innovation and efficiency in various industries including supply chain management as technology continues to advance rapidly, businesses are recognizing the need to embrace digital solutions to enhance their competitiveness. In the current competitive business environment, supply chain management is considered imperative. Management tools that facilitate the organization in the improvement of their business operations. The present goal of the companies is the fulfillment of customer demand with the profit maximization and the cost minimization. The companies are striving for attaining sustained competitive advantage with the effective utilization of internal resources.

Digital transformation in supply chain management has become a crucial initiative for business aiming to enhance efficiency, responsiveness, and overall competitiveness. This paradigm shift involves the integration of advanced technologies and digital tools to optimize various aspects of the supply chain, from

procurement to distribution . by leveraging digital solutions , organizations can streamline processes, and make data -driven decisions that drive strategic growth.

One key aspect of digital transformation in the supply chain is the adoption of advanced analytics . through the analysis of vast datasets ,companies can gain valuable insights into trends ,demand patterns, and potential areas for improvement. Predictive analytics, machine learning ,and artificial intelligence play pivotal roles in forecasting demand accurately, reducing the risk of stockouts or overstock situations ,and ultimately improving customer satisfaction.

OBJECTIVES:

- 1.To study Digital transformation in supply chain management.
2. To study Implementation new technologies in supply chain management.
- 3.To study Future trends of digital transformation in supply chain management.

REVIEW OF LITREATURE:

Aneeq Jamal: Digital supply chain also known as supply chain 4.0 to industry 4.0 designed for intelligent production units that was developed and Implemented based on big data technologies and the internet of things sensors ,GPS, electronic data interchange and information detection equipment are technologies that allows easy tracking of supply chain activities .

Digital transformation in supply chain management has garnered significant attention recent literature. Scholars emphasize the pivotal role of technology in reshaping traditional supply chain practices . the adoption of advanced technologies such as IoT blockchain , and artificial intelligence has been identified as a key driver in enhancing efficiency , visibility, and collaboration across the supply chain network .researches highlight that organization embracing these digital tools experience streamlined processes ,reduced operational costs , and improved decision making capabilities. The importance of data analytics in optimizing supply chain operations.

Big data analytics enables organization to data sets , facilitating predictive analytics for demand forecasting , inventory management , and risk mitigation . the integration of data driven decision making processes is seen as essential for agile and responsive supply chain strategies in the dynamic business environment .and challenges and risk associated with digital transformation in supply chain management are also a focal point in the literature. Scholars highlight issues such as cybersecurity threats, data privacy concerns, and the need for skilled workforce capable of navigating the digital land scape.

IMPLEMENTATION OF NEW TECHNOLOGIES IN SUPPLY CHAIN MANAGEMENT

1.Blockchain Technology in supply chain management

Distributed ledger technology which is the basis of block chain, is a database maintained and updated independently by each participant in a network and the records are built independently and maintained by each node. the entire chain of records in supervised by mathematical algorithms , ensuring data integrity and security . this ensures a complete record all operations included in the database.

2.AI in supply chain Management

Artificial intelligence is the ability of machine to imitate the human functions such as reasoning, learning ,planning and creativity. A supply chain generate a large amount of data , which can be analyzed , patterns can be identified and information can be generated about link.

3. IoT in supply chain management

The internet of things enables the interconnection via internet of smart devices that shares specific information and data with each other and with remote digital platforms to support real-time decision making processes by users or smart devices using machine communication IoT sensors will be able to provide important information to customers reducing the risks of non compliant delivery

4. Big data and analytics:

It play a crucial role in the digital transformation of supply chain management . the availability of large volumes of data enables companies to gain valuable insights and make informed decisions . It harnessing the power of analytics businesses analytics, It improves forecasting accuracy and enhance customer satisfaction .

5.Cloud computing :

Cloud computing technologies allows supply chain organizations to store and process large amounts of data , making it accessible from anywhere at any time . people interchange the term cloud computing with software-as-a-service . All though closely related , these terms has different things. Cloud computing is a broad term that encompasses various models used to deliver computing services through the internet as a utility and pay-as-you go .

6. Robotics Process automation :

RPA can automate manual and repetitive tasks , freeing up employees to focus on more strategic tasks . robotics is the supply chain and delivering huge value . it improves speed and accuracy of operations ,particularly , reduce error rate , cut pick, sort, and storing times and increase access to difficult or dangerous locations and with the current labours problems robots are shaping up the last mile workers of the future.

FUTURE TRENDS OF DIGITAL TRANSFORMATION IN SUPPLY CHAIN MANAGEMENT

1.Increased automation and autonomous vehicles :

A key aspect of digital transformation of supply chain management is the increased use of automation and autonomous vehicles. These technologies have the potential to revolutionize the transportation and logistics industry by improving efficiency .reducing costs ,and enhancing safety .with the ability to operate without human intervention ,autonomous vehicles can navigate complex routes , optimize fuel consumption ,and mitigate the risk of accidents.

2.Predictive analytics and demand forecasting:

Predictive analytics and demand forecasting have become crucial tool in digital transformation of supply chain management , and by leveraging sophisticated algorithms and historical data organization can predict future demand and adjust their operations. This enables them to optimize inventory levels reduce costs and must meet customers expect more efficiently.

3.Supply chain sustainability and environmental considerations:

companies to improve operational efficiency and reduce costs they also face pressure to meet sustainability goals and minimize their environment footprint from reducing emission and waste to adopting sustainable sourcing practices of the organizations are now integrating environmental considerations into their supply chain strategies to drive long term growth and By Embracing digital technologies and analytics , companies can gain better visibility into their supply chain operations , identify areas for improvement , and make informed decisions that contribute to both environmental sustainability and business success.

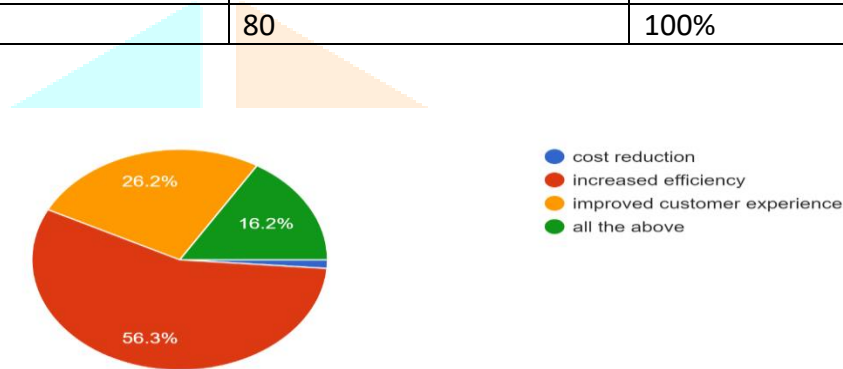
RESEARCH METHODOLOGY :

This article is used Both primary and secondary data and the sampling technique is purposive sampling and the sampling size is 81. The primary data was collected through questionnaire survey is conducted through a google form to elicit the views of the respondents and the secondary data is collected from articles , journals and magazines .

DATA ANALYSIS:

Table1: what is the main objective of digital transformation in supply chain management?

| Particulars | Responses | Percentages |
|------------------------------|-----------|-------------|
| Cost reduction | 1 | 1.3% |
| Increased efficiency | 45 | 56.3% |
| Improved customer experience | 21 | 26.2% |
| All the above | 13 | 16.2% |
| Total | 80 | 100% |



Interpretation : showing the half of the respondents 56.3% think that the main objective of transformation in scm is increased efficiency .only 16.2% think that the main objectives are 1.3%cost reduction ,26.2%improved customer experience ,16.2% all the above .

Table2: which technology is enables real-time tracking and visibility in the supply chain?

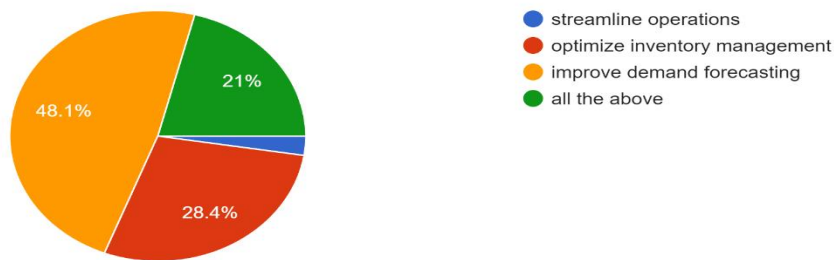
| Particulars | responses | Percentages |
|----------------------------|-----------|-------------|
| Artificial intelligence | 14 | 17.7% |
| Blockchain | 29 | 36.7% |
| Internet of things | 31 | 39.2% |
| Robotic process automation | 5 | 6.3% |
| Total | 79 | 100% |



Interpretation: respondents around 39.2% think that technology is used in the visibility of supply chain is internet of things .only 6.3%robotic process automation less used in visibility of supply chain17.7% artificial intelligence.

Table3:What is the purpose of implementing a digital supply chain network?

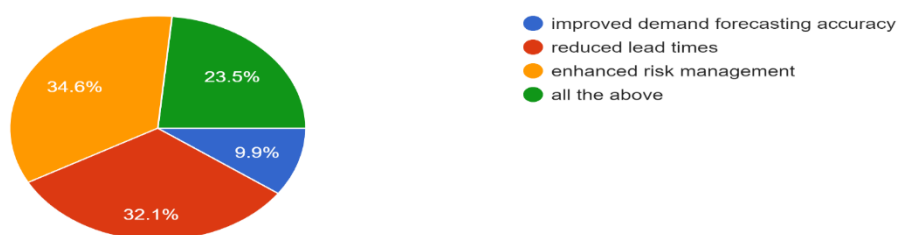
| Particulars | responses | Percentages |
|-------------------------------|-----------|-------------|
| Streamline operations | 2 | 2.5% |
| Optimize inventory management | 23 | 28.4% |
| Improve demand forecasting | 39 | 48.1% |
| All the above | 17 | 12% |
| Total | 81 | 100% |



Interpretation: Respondents around 48.1% think that the main purpose of implementing a digital supply chain network is improve demand forecasting only 2.5% streamline operations ,28.4% optimize inventory management , 12% all the above.

Table4:what are the benefits of using predictive analytics supply chain management?

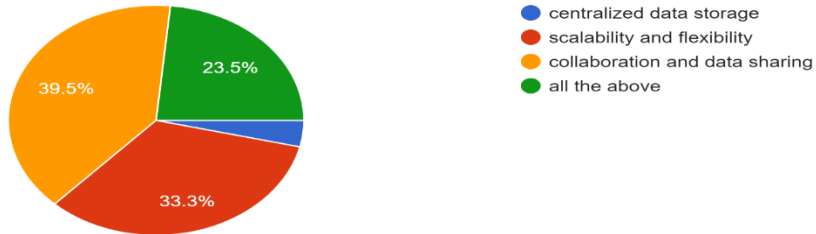
| Particulars | responses | Percentages |
|--------------------------------------|-----------|-------------|
| Improved demand forecasting accuracy | 8 | 9.9% |
| Reduced lead times | 26 | 32.1% |
| Enhanced risk management | 28 | 34.6% |
| All the above | 19 | 23.5% |
| Total | 81 | 100% |



Interpretation: Respondents around 34.6% think that the benefits of using predictive analytics supply chain management is enhanced risk management .only9.9% is improved demand forecasting accuracy,32.4% reduced lead times ,all the above 23.5%.

Table5: what is the role of cloud computing in digital supply chain management?

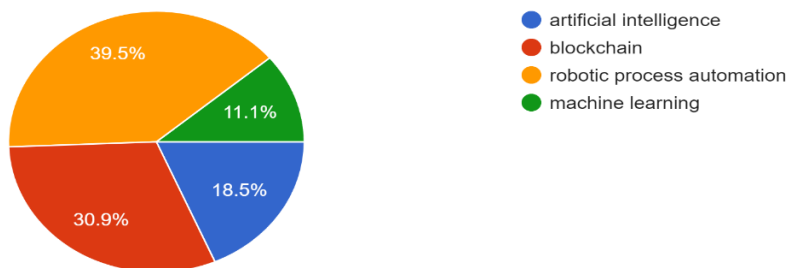
| Particulars | responses | Percentages |
|--------------------------------|-----------|-------------|
| Centralized data storage | 3 | 3.7% |
| Scalability and flexibility | 27 | 33.3% |
| Collaboration and data sharing | 32 | 39.5% |
| All the above | 19 | 23.5% |
| Total | 81 | 100% |



Interpretation: respondents around 39.5% think that the role of cloud computing in digital supply chain management is collaboration and data sharing, 33.3% think that the role is scalability and flexibility, only 3.7% think that the role is centralized data storage, and 23.5% think that the role is all the above.

Table6: which technologies used companies in digital transformation in supply chain ?

| Particulars | responses | Percentages |
|----------------------------|-----------|-------------|
| Artificial intelligence | 15 | 18.5% |
| Blockchain | 25 | 30.9% |
| Robotic process automation | 32 | 39.5% |
| Machine learning | 9 | 11.1% |
| Total | 81 | 100% |



Interpretation: Respondents around 39.5% think that the technologies used in digital transformation in the supply chain is robotic process automation and the 11.1% is machine learning, 30.9% think that the technology is blockchain, and 18.5% think that the technology is artificial intelligence.

Table7: How does digital transformation impact supply chain sustainability?

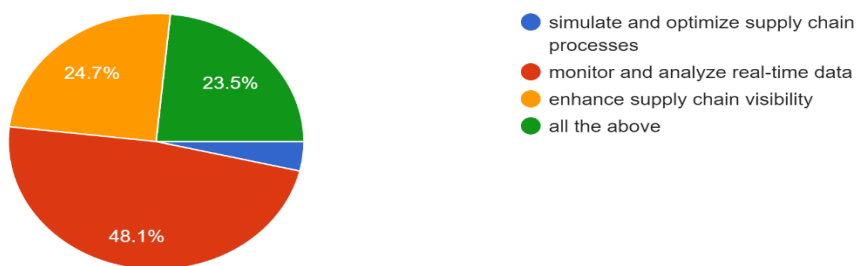
| particulars | responses | Percentages |
|---|-----------|-------------|
| Enables better tracking of carbon emissions | 4 | 5% |
| Facilities sustainable sourcing and procurement | 36 | 45% |
| Optimize transportation routes for reduced Environmental impact | 19 | 23.8% |
| All the above | 21 | 26.2% |
| Total | 80 | 100% |



Interpretation: Respondents around 45% think that digital transformation impact on supply chain management is facilities sustainable sourcing and procurement and 5% think that enables better tracking of carbon emission, 23.8% optimize transportation routes for reduced environmental impact.

Table8: what is main purpose of implementing a digital supply chain management?

| Particulars | responses | Percentages |
|--|-----------|-------------|
| Simulate and optimize supply chain processes | 3 | 3.7% |
| Monitor and analyze real-time data | 39 | 48.1% |
| Enhance supply chain visibility | 20 | 24.7% |
| All the above | 19 | 23.5% |
| Total | 81 | 100% |



Interpretation: showing the half of the respondents 48.1% think that the purpose of implementing the digital supply chain management is monitor and analyze real-time data and 3.7% is simulate and optimize supply chain processes, 24.7% enhance supply chain visibility .

Table 9: How does digital transformation impact supply chain easily?

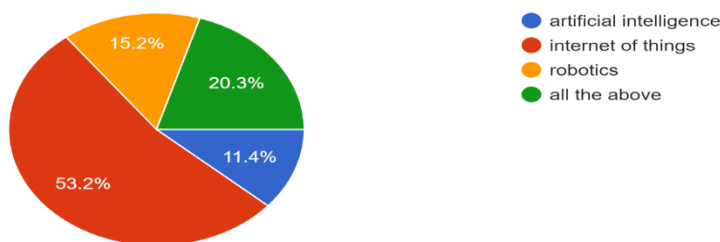
| Particulars | Responses | Percentages |
|--|-----------|-------------|
| Enable faster responses to market changes | 3 | 3.8% |
| Facilities quick decision - making based on real-time data | 39 | 48.8% |
| Enhances collaboration and communication across the supply chain | 21 | 26.3% |
| All the above | 17 | 21.3% |
| Total | 80 | 100% |



Interpretation : Respondents around 48.8% think that digital transformation impact supply chain easily is facilities quick decision-making based on real-time data. only 3.8% enable faster responses to market changes, 26.3% enhance collaboration and communication across the supply chain , 21.3% all the above.

Table 10: which technology enables autonomous vehicles in the supply chain ?

| Particulars | Responses | Percentages |
|-------------------------|-----------|-------------|
| Artificial intelligence | 9 | 11.4% |
| Internet of things | 42 | 53.2% |
| Robotics | 12 | 15.2% |
| All the above | 16 | 20.3% |
| Total | 79 | 100% |



Interpretation: showing the half of the respondents 53.2% think that the technology enables autonomous vehicles in the supply chain is internet of things .only 11.4% think that artificial intelligence , 15.2% robotics ,20.3% all the above.

FINDINGS:

1. Respondents opinion that there is increased efficiency is the main objective due to adoption of digital technology in supply chain management .
2. The internet of things In technology enables real time tracking and visibility in the supply chain.
3. Digital technology supply chain network are streamline operations , optimization in inventory management and improvements demand forecasting.
4. Digital transformation is reducing the risk in supply chain
5. The role of cloud computing in supply chain management are using centralized data storage , scalability and flexibility.
6. Respondents around 56.2% are using the technology enables autonomous vehicles in supply chain.
7. The digital transformation in supply chain easily facilities quick decision making based on real-time data.

SUGGESTIONS:

- 1.To implement supply chain visibility tools.
- 2 . Utilize predictive analytics to forecast demand and optimize inventory level.
3. To integrate e- commerce capabilities.

CONCLUSION:

Digital transformation has requires new digital business models for companies that want to remain profitable and maintain their current position in the market and the investment are required for digital transformation of the supply chain , but in the long run they will bring a reduction in costs and greater customer satisfaction . Digital transformation comes with new opportunities within the company and the mains focus should be increases digital transformation supply chain based on new technologies according to logistics the supply chain future is smarter, less volatile and easier .

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