Artificial Intelligence is Revolutionizing Logistics and Supply Chain Management in India

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A DISSERTATION REPORT SUBMITTED IN PARTIAL FULFILLMENT
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UNIVERSITY OF PETROLEUM & ENERGY STUDIES, DEHRADUN

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ARTIFICIAL INTELLIGENCE IS REVOLUTIONIZING LOGISTICS AND SUPPLY CHAIN MANAGEMENT IN INDIA

STUDENT DECLARATION

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgment has been made in the text.

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Shweta Dandriyal

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CERTIFICATE

This is to certify that the MBA Logistics and Supply Chain Management Final year dissertation report entitled "Artificial Intelligence Revolutionizing Logistics and Supply Chain Management in India" submitted by Shweta Dandriyal to UPES for partial fulfilment of requirements for Masters of Business Administration (Logistics and Supply Chain Management) is a bonafide record of the dissertation work carried out by her under my supervision and guidance. The content of the report, in full or parts have not been submitted to any other Institute or University for the award of any other degree or diploma.

Yours Sincerely

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ABSTRACT

To study of artificial intelligence as well as its use by sectors in India. To study the utilizing AI for market and demand forecast. To study the technology available in the world and their availability in India. To study the investment in the Artificial intelligence and to find out how it can help growth of these sectors. To analyse the factors that can drive the technological investments in these sectors.

By making use of AI in supply chain management, it is possible to analyse its performance and come up with new factors which impacts the same area. In order to find the factors and issues which affects the performance of the supply chain, AI combines the capabilities of different technologies like reinforcement learning, unsupervised learning and supervised learning, Infrastructure and Impacts of artificial intelligence in Logistics. Predictive capabilities will rise. The report includes details about projects that help analyse the future scenario. Performance is measured according to the technical aspect and the financial aspect.

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INTRODUCTION

The focus of Indian companies is earning more by Artificial intelligence and improve the productivity, accuracy, efficiency and demand of customer and customer's expectation. To build a new and large quantity of data is collecting by using intelligence which is so accurate and complete. Companies will make better decisions as a supplier and work towards improving customers. Artificial intelligence is taking up the industries into global fields of logistics and supply chain management.

The number of executive or manual transportation are increasing their capacities and improving time management with the help of AI.

Artificial intelligence expected to go through a more significant transformation. The on-going evolution in the areas of technologies like artificial intelligence, machine learning, and similar new technologies is said to improve the capacities of the firm and they will help to create a new era of supply chain management and logistics to help the industries in every aspect.

Investment in AI:

Many organizations have now been benefitted with investments in artificial intelligence. As per Adobe, currently, 15% have already started to use AI while other 31% plans to have them implemented in 2019. Some of the areas from which revenue can be generated are research and development, product innovation, supply chain operations, and customer service.

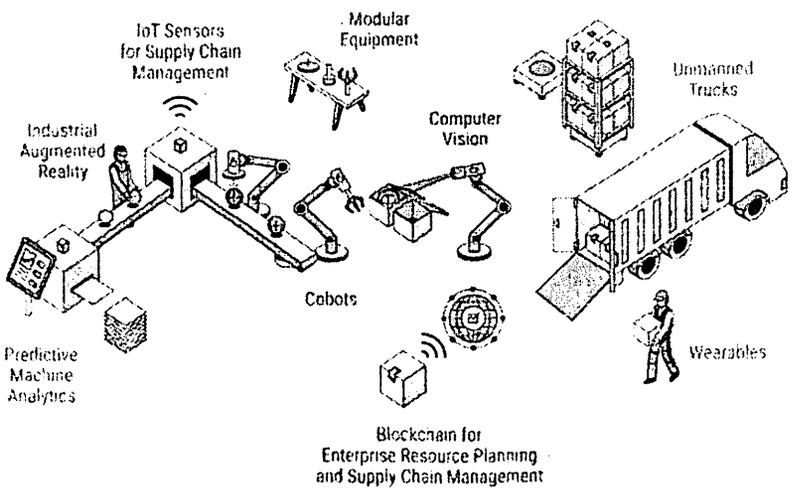

Figure 1:

How AI can solve logistics problems and generate value:

1. Automated Warehouses
2. Autonomous Vehicle
3. Smart Roads
4. Demand Prediction
5. Back Office

LITERATURE REVIEW

Under this study reviewed various implementation of Artificial Intelligence in different sectors in India. In this research study observed new technologies improving the areas and its working principle, Moderate warehouses, transportation GPS. affects utilities cost, effectiveness, efficiency, structure furthermost, income also. There are numerous techniques associate with AI improving effectiveness and decreasing time in work like:

Computing power and speed: The rapid development of computers enables companies in incorporate AI into their operations because latter required significant breakthrough in the power and efficiency.

Big Data: Supply and logistics companies produce, can use a lot of data. AI requires volume of it to show full power to work to its fullest potential.

Enhancing supply chain productivity: It can provide to company perfect analysis in productivity so, that companies can produce with utility.

Improving supplier selection and supplier relationship management: AI analyse supplier-related data such on-time-in-full delivery performance, audits, evaluation and provide information that will help in future with better understanding and in better way.

AI-enhanced the particular area and customer experience: It changes relationship between logistics providers and customers by personalized them to know the customer's requirement and described all the terms in following diagram:

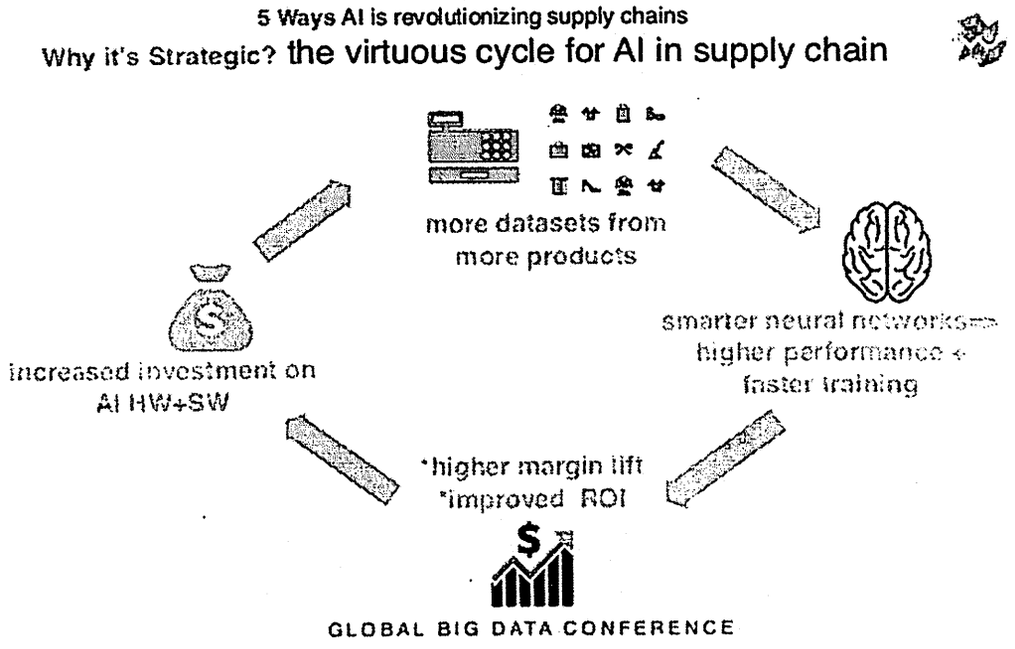

Figure 2:

For this study the major literature comes from articles, reports and some papers already discuss about these source of literature reviews:

S.No.	Name of the Article/Paper	Author	Year of Publishing	Inference	Findings
1.	Supply Chain Management under Fuzziness: Recent Developments and Techniques	Divesh Kumar, Chandra Prakash Garg	2017	Techniques and models for supply chain management.	Artificial Intelligence has a significant scope in India and can provide many facilities in various areas but the exploration and exploitation of the source is not yet by the Indian companies.
2.	Advances in Computational Intelligence in transport, logistics, and supply chain management	Andreas Fink, Franz Rothlauf	2008	Various methods used for transportation in India.	The book refers a careful selection of relevant applications of AI methods for transport, logistics, and SCM 4problems. The chapters illustrate the current state-of-the-art in the application of CI methods in these fields and should help and inspire researchers and

					practitioners to apply and develop efficient methods.
3.	Ad Advanced Analytics and AI	Sameer Dhanrajani	2018	New processes used in learning by AI.	How advanced learning understand natural language and self -learning. It shows the improvement in business using in supply chain.

RESEARCH PROBLEM

New era of Artificial Intelligence in different sectors in India:

Indian companies using Artificial Intelligence for better performance and time management. Not for every Industry some businesses cannot afford AI due to financial conditions in India.

Using GPS in transportation to know the condition of product could be not accurate because availability or quality of network decreases computing power and speed also. This could create a problem like the tracking orders by customers. Moderate warehouse like: cold storage, for perishable goods etc; these helps in transportation but what if the companies unable to search a perfect location for the moderate warehouse in nearby cities, weather conditions, region, segmentation and cost then the storage problem creates in Logistics and supply chain management .

Enhancing logistics and supply chain productivity and supplier selection defers when the companies continuing with traditional methods in India. New technologies with Artificial Intelligence give better outcome but the people don't know how to use the technologies which decreases the efficiency or quality of products. Sometimes not using AI differs new products and services that can be decrease the customer or their loyalty in India. This is biggest challenge.

The problem is categorised with respect to the three-level decision-making hierarchy are: strategic decisions that deal with long-term, executive-level issues such as strategic alliances, facility.

Comparison between traditional supply chain and integrated AI in Logistics and supply chain:

Sr. No. Characteristics	Traditional Supply Chain	Digital Supply Chain
1 Transparency	Limited View	Complete View
2 Communication	Delayed communication as information flows through each department.	Instant communication as data is shared with all stakeholder in real time
3 Collaboration	Limited collaboration on due to limited visibility across supply chain	Higher collaboration on due to greater information across all stakeholders
4 Flexibility	Low flexibility as information flows along the material flow.	High flexibility as information exchange happens in real time

OBJECTIVES

Previous Scenario of logistics and SCM (without Artificial Intelligence)

One of the most beneficial and available methods by using Artificial Intelligence in logistics and supply chain management in India. According to few criteria which includes affordability, accessibility, reliability, availability and safety also because many companies using their traditional methods don't want to use AI. Availability of artificial intelligence sometimes not afforded by companies due to their financial conditions which decreases productivity, forecast, transportation and efficiency also.

India is one of the developing countries in the world. India have 10 Maharatna companies, 14 Navratna and 73 Miniratna companies divided in different categories include financial turn-over also all are using AI and increasing their financial benefits, customers as well as work efficiency. As increasing value of Indian logistics and supply chain market is expected to increase their worth form US$160Bn - US$215Bn. About 90% Logistics Indian companies believe that Artificial Intelligence is a key for the future and the growth.

Below figure: Investment in AI by Indian companies ease of growing market worldwide with returns, from 2018 to 2022(in million U.S. dollars)

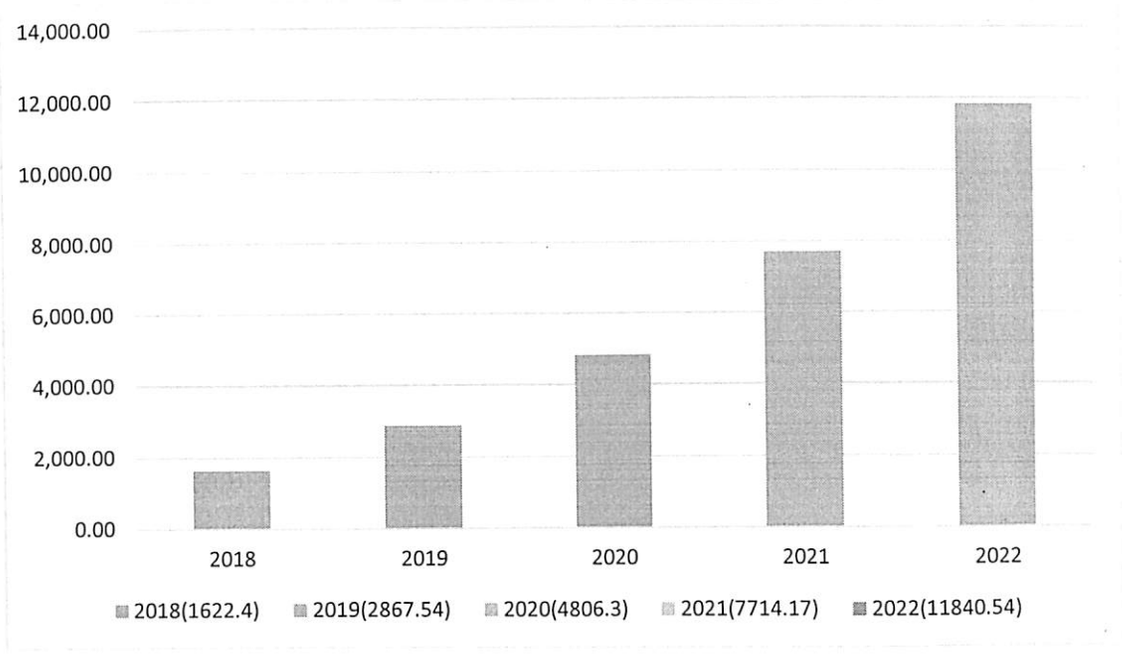

Figure:3

According to this figure: The logistics and SCM companies are growing in regular basis with the help of artificial intelligence improving earnings and results are positive also. According to shown in figure the data of 20121 and 2022 targets have been presented above.

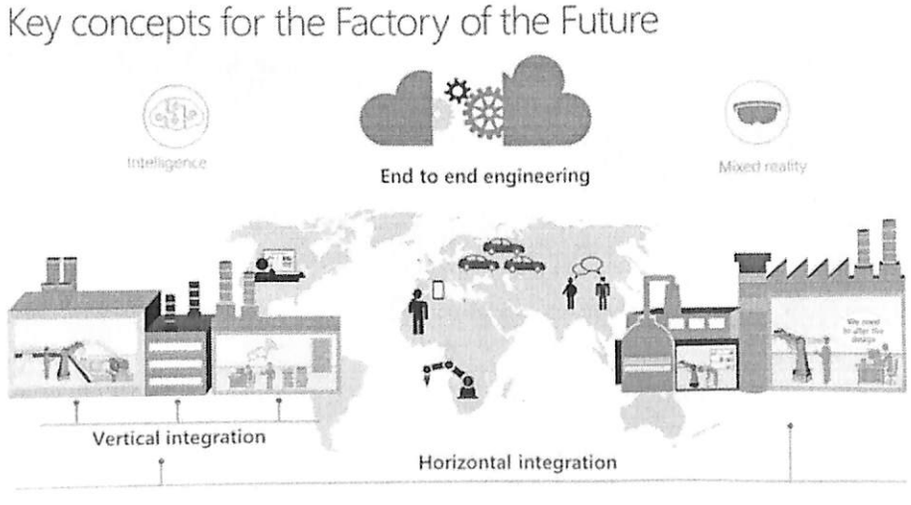

Figure 4:

According to the below figure various areas are using artificial intelligence in

process of supply chain and logistics. How they are connecting with the manufacturing to supplier then transportation and finally to the customer. That's why Indian companies investing in AI.

RESEARCH METHODOLOGY

Any research is carried in a series of processes that is followed to sequence the activities that will help to achieve the analysis and conclusion of the study.

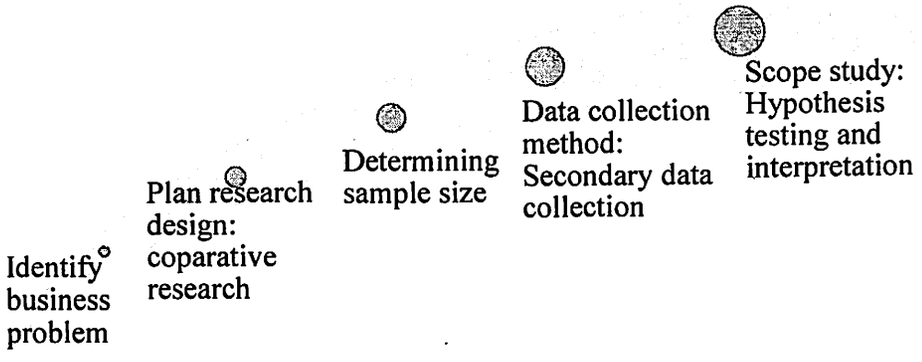

Figure 5:

RESEARCH DESIGN

The research design is simple and concluding the problems, solution and conclusion of using Artificial Intelligence in supply chain management in India on basis of past scenario, present challenges and opportunities for future framework.

DATA COLLECTION

Secondary data is the data which is collected from internet or from other methods which includes different sources. The secondary data has already been collected and unlike primary

data, is quickly obtainable and cheap. To using secondary data we need to keep in mind the fact what kind of data we want and is it available or not or what should be taken or evaluate. The dependability of source should also be taken into consideration. Usually published data are available in: (a) Press releases by the respective companies (b) various publications of foreign governments or of international bodies and their subsidiary organisations (c) various publications of the central, state are local governments; (d) technical and trade journals; (e) books, magazines and newspapers; (f) reports prepared by research scholars, universities, economists, etc. in different fields; (g) reports and publications of various associations connected with business and industry, etc.

DATA EXAMINATION

The Secondary data collected from internet, journal and research paper or reports it can be University reports or individuals. On basis of collection data and process contains logical thinking and cause root analysis on basis market analysis on basis of market trends. This is final stage of the study.

Supply chain and Logistics with AI the next frontier:

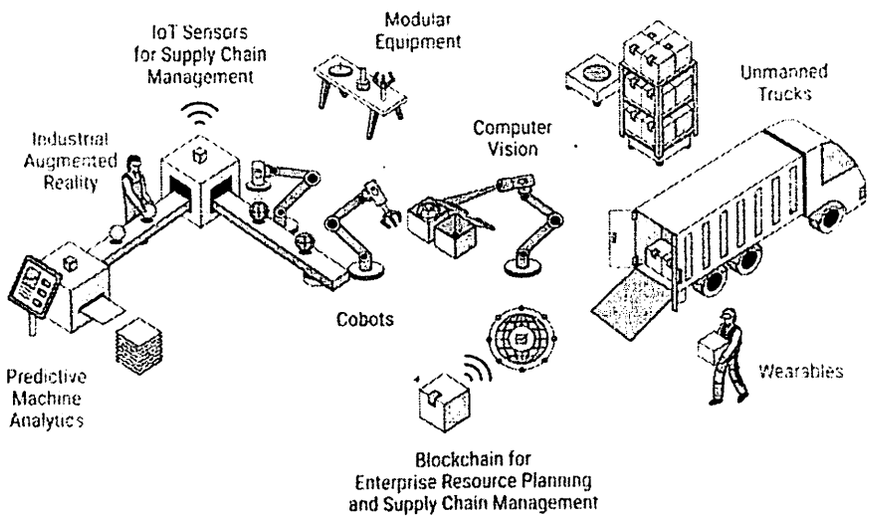

Figure 6:

AI has presented a huge opportunity for the SCM and logistics in India. According to country's economic survey, the value of Indian logistics market is expected to increase from US$160 Bn to US$215 Bn in next 2years. The benefit from effective AI implementation can range from optimizing delivery to reduce costs and maximize speeds to spurring and enhancing productivity across the entire supply chain.

DATA ANALYSIS

On basis of collected data, analysis has been done. Data analysis process contains logical thinking analysis on basis of market trends. Data Analysis and concluding the results is final stage of the study.

The significant analysis of different logistics companies in India in basis of their Fastest time in hours without AI (First delivery attempt) and Fastest delivery attempt with AI (in hours).

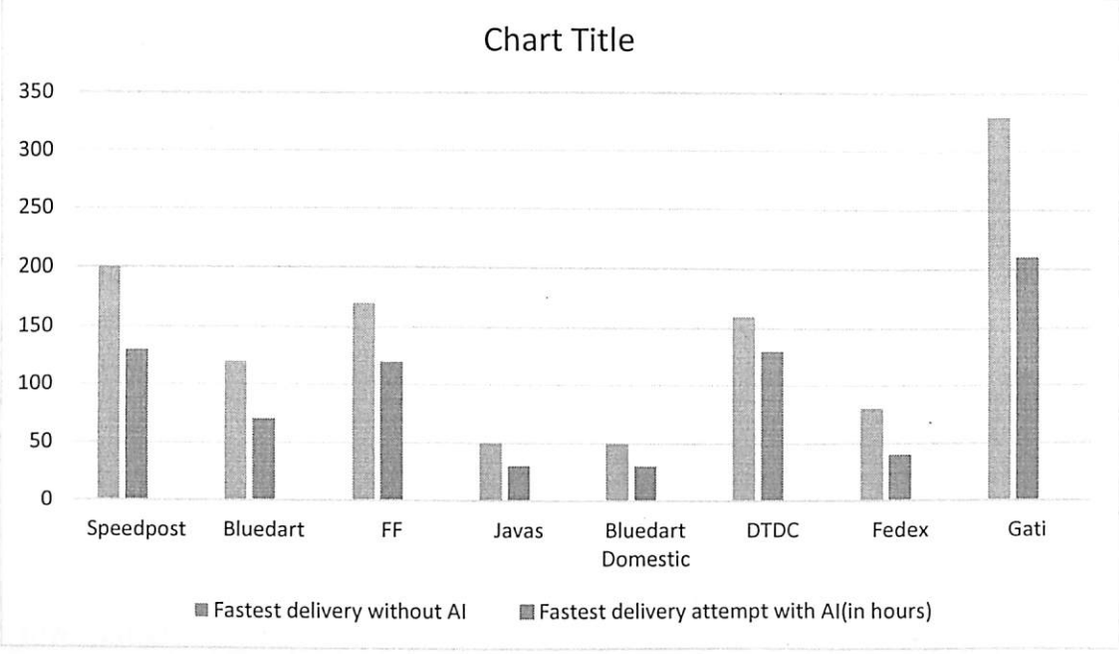

Figure 7:

There are various sectors also analysed in our paper and the technology adoption in the process of logistics and supply chain management. According to data shown in the figure fastest delivery with AI is more efficient than fastest delivery without AI. Companies are decreasing their transportation hours with the help of artificial intelligence any improving their area of business also by using new methods in logistics and supply chain management.

The following data of fastest delivery with AI are: Speedpost-20%, Bluedart-13%, FF-17%, Javas-4%, Bluedart Domestic-5%, DTDC-16%, Fedex-8%, (highest) Gati -33%. The data Analysis and concluding the results is final stage of Research study.

SCOPE OF STUDY

The scope of my study is to analyse the performance and its optimization, the commercial viability of technology is the most necessary part of supply chain management and logistics.AI helps to stay for long time. The project included analysis to achieve the objective. The problems after implementing AI by Indian companies was that many people do not want to use technology, fear of losing jobs, financial issues, operational costs of AI but to explore the areas companies using AI and now the result is clear.

Some industries using AI with benefits:

Fedex, Gati, Flipkart, DTDT, Bluedart it improves efficiency, growth and increased earnings. Better vehicles that decreased Transportation hours, better customer experience by easy to connect, increased as well as quality improved and accurate demand forecasting, automated warehousing.

AI improves areas in positive way one by one ever company using AI to better the logistics and supply chain management processes.

LIMITATIONS

Difficulties

That some companies using AI having benefits but some of them losing their methods, strategies, culture and human jobs. The difficulty is to search that how many companies lose their employers and improve enhancing cost, change financial conditions using AI. Some industries still using traditional methods not using AI by ignoring due to affordability, culture, work environment.

Some major difficulties during this project has been collecting data that could be used to build and analyse the AI model.

Benefits	Challenges,	Future Views
Enhanced quality	Are the current solutions automation or intelligence in India?	Best applications are still to come
Lower costs	Lack of computing power	Half of global GDP growth will result from AI

Increased agility	Narrow capability & not human-like thinking	Unequal growth and use of AI worldwide
Better CRM	Lack of understanding and professionals	Logistics and Supply chain management industries the most

The current artificial intelligence can handle many narrow tasks, but it lacks at least the capability of generalizing. Despite the doubts, AI could easily bring many advantages to supply chain management and enhance the current processes, and maybe this is the reason why companies are investing in this technology so much.

Most of investment in AI has consisted of internal spending. Research and Development a large, cash-rich digital native companies. At the same time, big tech companies have been actively buying AI start-ups, not just to acquire technology or client but to secure different factors. LIKE: improving customer experience, accurate demand forecasting, growth, better transportation, automated warehousing etc.,

The collection of theoretical evidence in this paper was made through the follow –

1.**Selection journals:** To achieve of the articles, paper of supply chain management in three selected academic journals of logistics and SCM from 2014-2018 were viewed: Machine learning -A giant leap for supply chain forecasting (Forbes -2016).

2. **Assessing review time frame:** Year 1997 chosen as starting point for selection papers for reviews since the framework of supply chain management were published in the year (Source-Bechtel & Jayaram).

3. **Search for paper validation:** The database was applied will be following search criteria: AI in supply chain management an exact phrase in the title or abstract (source-Luke Waltz; 2018).

Top areas where businesses are driving revenues from AI investments:

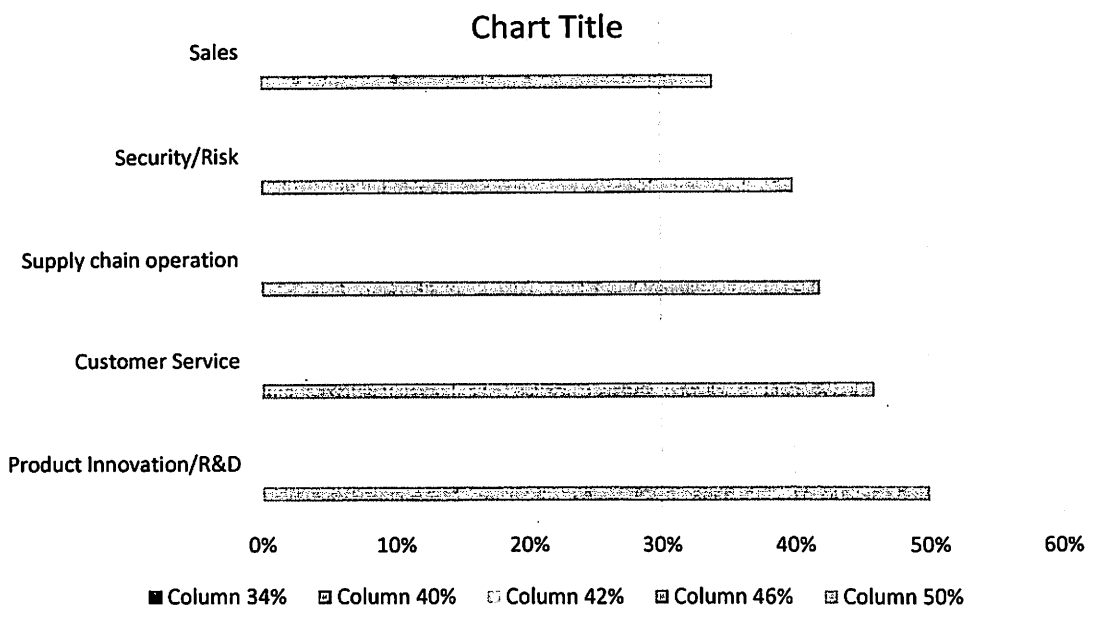

Figure 8:

Impact after implementing AI in logistics and supply chain management industries in India. These data and figures cannot be easily improved at the source, so algorithms are being used to analyse historical data, identify issues and improved data quality to level where significant transparency on the business is gained.

In India and across the global, supply chain start-up has been playing a key role in revolutionizing the space with their AI-led innovation, cutting edge solutions and next-gen model. Some notable Indian supply investors for their revolutionary solutions are:

Delivery: Offers technology-driven logistics service such as last-mile delivery, third-party and transit warehousing, reverse logistics, shipping, etc.

Fareye: Offers an automation software and mobile platform to uncomplicated last-mile delivery issues.

Rivigo, Trukky.com, LogiNext, Blackbuck, 4tigo, etc.: Offer smart logistics solutions including trucking, truck hiring, real-time tracking, delivery planning, etc.to B2B and B2C customers.

Shipsy and Fourkites: offer predictive supply chain platforms to ensure real-time visibility to their B2B clients.

There is growing awareness amongst organisation about the criticality of intelligence and efficient supply chain management and optimization of their overall business outcomes and long-term sustainability. Despite this realization, studies show that only 30-40% of Indian businesses are leveraging AI-enabled tech solutions in their supply chain activities while others still traditional, linear models. Two main causes of awareness of grassroots innovations by start-ups.

SOURCE OF DATA

Secondary Data

1.Published papers

2. Private business firms

-DTDC: Alfa supply chain solutions pvt.

Mumbai, Maharashtra

-ACG Infotech ltd., Delhi

3.From internet-

-https://supplychainbeyond.com/artificial-intelligence-in-the-logistic-industry/

-inc42.com/resources/transforming-SCM-logistic

4.Universities research

-University of petroleum and energy studies:

Advantages of AI in different sectors and how it is revolutionizing supply chain management and logistics:

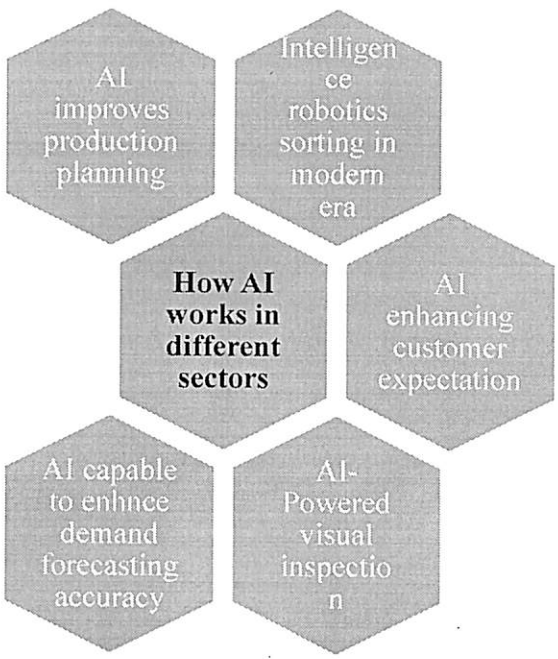

Figure 9:

Supply chain management with AI enables businesses to transform customer experience while unlocking capital to drive growth. AI improves various factors/areas in supply chain management and logistics which helps managers to analyse and track data, detect anomalies and generate predictions to improve supply chain operations. Additionally, artificial intelligence can enable exceptional agility and precision in supply chains in India.

The main aim of integrating AI in the supply chain is to create a fully automated and self-adjusted decision-making system of Indian companies. AI-powered supply chain management enables businesses to accurately predict demand spikes and adjust the routes and volumes of material flows.

'Artificial intelligence and machine learning are used by many companies to inform and fine-tune core strategies, such as warehouse locations, as well as to enhance real-time decision making, new methods, accurate data, better transportation facility, personnel, inventory and carriers. Main focus is on data feeds on achieving greater optimisation and responsiveness across the whole of their logistics, supply chain and transportation footprint'.

ARTIFICIAL INTELLIGENCE ENHANCED FACTORS/METHODS IN SUPPLY CHAIN MANAGEMENT AND LOGISTICS

Artificial Intelligence is infancy still and the marketing has reached in its maturity. A key challenge facing the companies using AI is that individual don't AI fully because of marketing and media messages from vendors of artificial solutions. Artificial Intelligence having narrow intelligence which describes that status of today using artificial intelligence is same idea with a more restricted modes, often focusing on just one small aspect of a larger topic. All AI in this category in narrow intelligence.

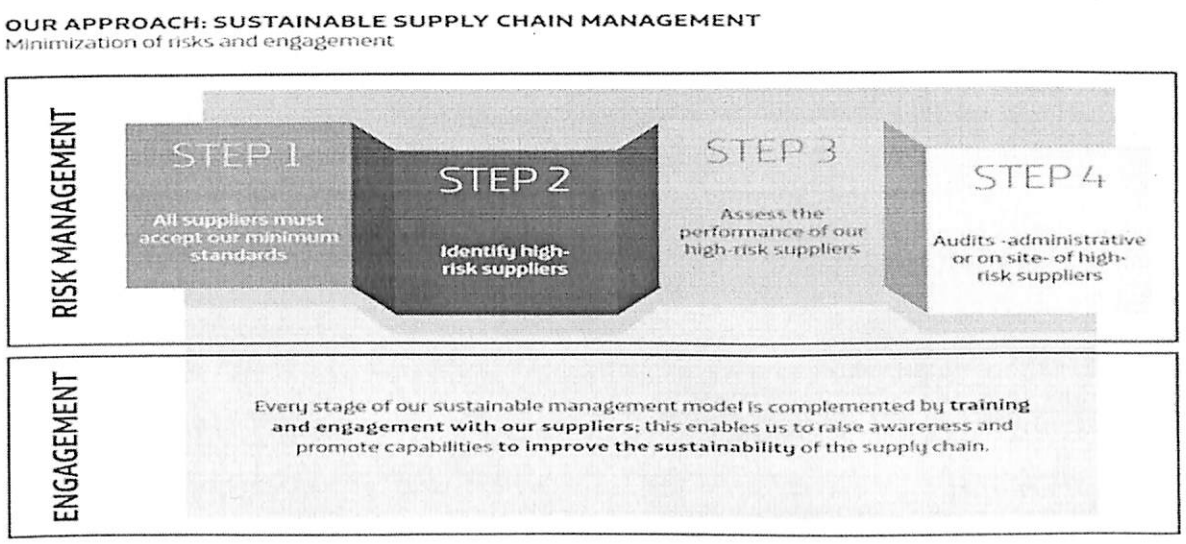

Figure 10:

Supply chain management (SCM) is critical in almost every industry today – but it hasn't received as much focus from AI start-ups and vendor companies compared to healthcare, finance, and retail. Businesses are showing increased interest in AI applications, from its benefits to fully leveraging the vast amounts of data collected by industrial logistics, warehousing and transportation systems.

we explore companies and use cases to examine their business value:

Predictive Analytics for Demand Forecasting and Customer Expectations

AI for Warehouse Management

Chatbots in Procurement

CONCLUSION

- After doing all the examinations and analysis it is found that artificial intelligence changed the methods and improves the functions of supply chain management and logistics but still specialist and leaders still believes that AI is not a priority. In many cases human being is prior than AI which can handled manually not by artificial intelligence like: Decision making, growth strategy, financial management, cost, way of transportation, targeted customers etc.,

- AI will become a bigger and inherent part of day-to-day business, acceleration the path towards proactive, predictive, automated, and personalized future for logistics and SCM in India.

- After studied the result of artificial intelligence industries improving functions, methods, creating opportunities also for collaborative and joint exploration using AI in organisation. Very soon will capture a large portion of logistics and SCM.

- AI is creating large scope and helping in fast growing market of supply chain and logistics, easy to connect in every portion of world. AI Creating large number of customers, connecting industry to industry, expectations, increasing demand, accurate data, quality of products and services as well as safety.

- Meanwhile, the artificial intelligence in SCM and logistics company in US, Europe and other countries, India can be a leader the world in supply chain and logistics using AI. With positive results by AI, the Indian logistic companies growing continuously.

- Much more collaboration of artificial intelligence and human being is required to ensure the development of the logistic and supply chain industries in India.

- Companies make use of AI get new insights, new ideas, broader scope. AI in smart warehouse, provides better quality and accuracy in transportation, data accuracy and automated predictive analytics.

- Lots of companies have already benefited from AI investment. AI in smart warehouse, automated predictive analytics. AI providing the accuracy in transportation.

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