

# “Growth Drivers in International Logistics’ And Supply Chain: Emerging Technologies As Competitive Strategy In I.4.0

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**Abstract:** Supply chain and International logistics is changing and evolving into something new every minute ,every hour ,every day though invention and development various next generation of emerging technologies, which enable smooth functioning of logistics’ and supply chain activities across the globe .Today’s emerging technologies are more concerned with speed, accuracy, safety and seamless delivery management across value chain and be the strong growth drivers in logistics and supply chain across the globe irrespective of geographical boundaries.

## INTRODUCTION

**Growth Drivers of Supply Chain & Logistics' Industries:-** *These emerging technologies and applications will forever changes the industry of, Manufacturing, Supply Chain ( Including Stores, Material , Procurement ,Inventory activities), Logistics activities on International & Domestic level are:*

**1. The Internet of Things (IoT).2.Cloud Computing.3. Drones.4. Driverless Vehicles.5.Big Data and Predictive Maintenance Technology. 6. Augmented Reality (AR).7. Autonomous Robots. 8. Block Chain .9. Green Supply Chain. 10. Google Glass & Voice Technology.**

**So what makes a next gen supply chain and logistics across the globe**

### Industry 4.0.

**“The question arises with industry 4.0 of whether it is an evolution or a revolution.”**

**-Industry 4.0, is a broad vision of tomorrow's manufacturing ,Supply chain and Logistics’.**

- **In I 4.0 , products finding its own way to get processed , through production process**
- **I 4.0 ,enables machines and product to communicate with each other , cooperatively driving production.**
- **I 4.0 ,connect products that communicate with users.**
- **I 4.0 , explore new digital business models , collect data to offer additional services as a service products.**
- **Most important in I 4.0 , that products on the assembly line speaks to shop floor machinery , how they are to be processed.**
- **Effective fleet and cargo management.**

**The Internet of Things (IoT)**- is a revolutionary manufacturing technology & network of physical & electronic objects ,embedded with sensors, software, within the existing network connectivity, ,enabling them to collect, exchange, and act on data, usually without human intervention—IoT , along with Cloud –Based GPS, make possible to keep track individual item and their conditions. Goods no longer be lost or misplaced in transit ,since each product will transmit its location.IoT, enables with RFID Chips , that attached with individual items to talk & transmit data pertaining to Identification , Location , Temperature ,Pressure, Snag , Humidity , Traffic conditions &,Damaged goods to central office in real time.IoT also benefits existing Supply Chain processes, Spanning assets utilization ,Warehouse space optimization & Production planning. IoT , provide opportunity for Supply Chain groups to co-develop new information based solutions for individual customers or markets.This technology is beneficial for 3PL & 4 PL to reap the rewards of highly satisfied customers thru fastest delivery & customized requirements.

**CLOUD COMPUTING:** Is the facility available of network of internet-connected remote servers to store, manage & process data, which enable to scale up SCM activities in cost effective manner.

-Highly effective for procurement & inventory people as well as shipping & logistic companies , reduces the dependence on local data base .Providing agile , real time communications across the different levels of value chain, which helps organization to collaborate quickly & respond to problem effectively.Since Cloud Computing is more scalable & dynamic ,allow companies to counter the problems of continuous shortening of materials , product & service life cycle , increases competitive advantage.Reflects positively financial results of the organizations, be a part of corporate strategy.

**DRONES :** An unmanned aircraft that can be either controlled remotely or left to fly autonomously through software controlled flight plans, embedded in their system.

- Small, light & inexpensive to operate , can be used by 3 PL & Material people to deliver small packages with high speed & precision ,ensure speedy & safe delivery even at remote places.Technology is already available ,wherein Drones are going to charge electric vehicles when battery is running low.

**DRIVERLESS VEHICLE :** *Still in trial phase ,but having tremendous potential as tools for logistics & supply chain management.*

-Absolute Zero human intervention, no driver error ,higher efficiency through speeding up traffic flow ,allowing freight trucks to travel 24/7 without requiring driver rest time. - Highly beneficial for 3 PL and 4 PL ,substantially reduces their overheads by using driverless vehicle for delivery , which smoothen logistics activities across the globe .

**BIG DATA &PREDICTIVE MAINTENANCE TECHNOLOGY:** *Allow industries to collect, process & measure big data to increase efficiency & productivity in real time.*

- With this technology , factories can connect with all value chain partners through internet & web pages that double their dashboards for controlling the processes.- Big Data along with Advanced Analytics ,which is more specific provide, an end-all solution to SCM & Logistics like –\* Provide supplier network with grater data accuracy.Near to accurate demand forecasting.Integrated business planning &VMI. Risk analytics & Speed.Predictive Maintenance Technology helps in predicts snags& defects ,thus cuts downtime as well as cost.

**AUGMENTED REALITY (AR) :** *Provides a direct or indirect view of the real world of supply chain , logistics' , business environment ,augmented by computer- generated sensory inputs.*

- AR is People- Performance technology ,provides wearable devices to gain critical information about each parcel ,freight , weight , content, destination, loading ,handling & delivery process.AR improving the handling of goods and speed of delivery to reduce the overall cost.

**AUTONOMOUS ROBOTS :***More autonomous ,flexible & cooperative interact with one another & work safely side by side.*

- Cost less with greater range of capabilities' than those used in manufacturing supply chain today. This robots with computer screen faces ,can perform multiple task ,including materials handling ,loading , unloading , product inspection, light assembly ,sorting & packaging.

**GOOGLE GLASS & VOICE TECHNOLOGY :** *This technology contains the fundamental component of any Computer or Smartphone .*

- More beneficial to Material handling & Logistic people, it allows to access exact distance , location of item(s) they are away from in the warehouse need to be pulled out.

**BLOCKCHAIN :** *Is the technology behind Bitcoin & other crypto currencies. Blockchain is a protocol for digital ledger that enables proof of ownership from one entity to another without using a trusted third party intervention (like a bank).*

- -It enhances transparency in the transaction (Proof of work), with stability, security as transferred value recorded in chronological order in an extended supply chain .-Very effective in port logistics management .

**GREEN SUPPLY CHAIN:** *It integrate environment thinking in to supply chain management including product design ,material sourcing & selection ,manufacturing process, delivery of the final product to end user .*

- - It reduces waste, reduces air & water emission ,reduces fuel consumption ,reduces noise & traffic congestion.- Improve health ,safety & security.- Increase revenue by reducing cost , increase asset utilization ,enhanced consumer value.

**HOW EMERGING TECHNOLOGIES ARE CHANGING SCM /LOGISTICS INDUSTRY :--**

- *Uber is just a software too, don't own any cars ,but are now biggest taxi company in the world.*
- *In 2030 it confirms that computers will become more intelligent than humans (AI effect).*
- *FB , has pattern of recognition software , that can recognize face better than humans.*
- *Autonomous cars already in the testing phase , we don't need to own a car anymore.*
- *Electric cars & freight trucks will become mainstream about 2020.*
- *China & Europe already started 3D printing, by 2027, 15% of everything that being produced will be 3D printed.*

- ***Block Chain or Crypto currencies become the default reserve currency of the world.***
- ***Can control international logistics activities by sitting at one place ,ensuring seamless delivery in coordination with shipping lines.***

#### **MAJOR CHALLENGES :**

*\*Untamed economy & Impending collapses: Results in unchecked materialism, mass consumptions, erratic growth cause demand for Materials management, Logistics' & Transportation services to greater uncontrollable height. Need of Mega efficiency in Mega cities or Metros: Since traffic congestion, congestion in parking space, warehousing problem ,improper store & warehouse lay outs. Paralyzing Protectionism: Triggered by economic hardship, excessive nationalism ,barriers, reverse globalization, high energy & fuel prices, conflicts over resources. Global Resilience & Local Adaption: Because of frequent catastrophic conditions caused by climate change, which disrupt supply chain & lean production structure. Cyberattacks :The attacking technology like Trojans virus, inclusion in SW/HW at any phase of supply chain is on rise for the purpose of hacking.*

#### **SOLUTIONS TO MAJOR CHALLENGES:**

*Development of a global material, Logistic & Transportation “ SUPER-GRID” .Solution: A global super-grid of mega transporters , space transporters , warehouse's ,support trade between mega cities.: As per WTO Resolutions. Green Manufacturing ,Electric vehicls,Fuel Cells,Bio- Diesel. In order to protect industries should include an Expanding Security Procedures to include vendors,partners and even customers.*

#### **GLOBAL POSITIVE IMPACT:**

***As technology have been simplifying SCM ,Logistics process, control over inventory& reduces the cost.***

***\*US Logistic business ,which deliver 52 million tons of freight (worth about \$52 bn)daily ,employ roughly 6mn people operates mostly behind the scene .Also looking to fill 1.4 million more jobs by 2020.***

- ***Amazon’s annual savings for a logistics company is projected to be at least \$2 bn in the pessimistic forecast and on around \$10 bn in mid range forecast.***
- ***\$1 bn investment by GM in self- driving car by software up to 2020.***
- ***IDC report says that , revenues for big data & business analytics would be more than \$ 203 bn in 2020.***
- ***Coca Cola save \$ 2mn in capital cost,10% improvement in workers productivity & Inbound- out bound order accuracy by 99.8%.***

**Overview of Indian SCM & Logistics Sector:**

**Infra investment & GST implementation helps SCM & Logistic industry to grow by 11.5% CAGR, accounting INR 14,19,000 Cr.**

**\*The impact of this positively reflects on each sub -sector like, Road Freight, Rail Freight, Warehousing, Waterways, Air Freight ,Packaging ,Courier Services, is likely to result in 3 million jobs up to 2019-2020.**

**\*Public investment of INR 6 Lac .Cr. Is the primary factor driving job growth.**

**\* 40K jobs every year in IT – SCM Coupled industry.**

**\*India’s ranking on the World Logistic Performance Index (WLPI), has risen to 35 from 54 in 2017.**

**Conclusion:**

*Customization is the order of the day and to sustain in today's logistic and supply chain management. Now collaboration and coordination will be the need of an hour to achieving the benefits of SCM. Customer centricity across the globe make International logistics and SCM more critical along with the need of maintaining or optimum increase in profit margins ,require corporates to rapidly adopt the emerging technologies to stay ahead in competition by integrating new technologies with strategic business plan, can greatly enhance the supply chain through cutting costs and improving customer satisfaction as well as market share.*

*International logistics and supply chain management is no longer a cost doing business ,now it has become a platform for growth enabling corporates to open new markets and channels to reach new customers globally.Simple mantra in international logistics and SCM is simple and straight constant innovation to provide value to end user.*

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