

LOGISTICS INDUSTRY GROWTH USING EMERGING DIGITAL TECHNOLOGIES

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ABSTRACT

Technological trends behind logistics operations have progressed substantially in the past few years, from traditional logistics to mass use of e-logistics. This transformation is essential to the competitiveness of the logistics business. Internet of Things (IoT) and the Internet of Everything has a powerful impact on the logistics itself, although it may not be entirely noticeable for the end-user. Supply chain management moves and grows just as 3rd-party logistics and 4th-party logistics extend to 5th-party logistics. E-Logistics develops different disciplines where cloud-based processes, m-logistics, mobile supply chain management, and augmented reality are significant areas in the future of logistics. The objective of this study is to identify the usage of digital technologies in logistics industry growth.

Keywords: E-Logistics, Industry 4.0, Internet of Things, IoT, Business, Supply Chain Management

Introduction

Information and Communication technologies (ICT) are playing a significant role in the growing competition of logistics enterprises. Old methods of businesses are not flourished well by ICT, so it becomes a tough task to face the needs of the digital market. Thus e-commerce is gaining significance due to its velocity, affordability, transparency, green orientation, and in the way of processing information. Similarly, both logistics and e-logistics are processing uniquely. Though numerous explanations are there available for e-logistics, its exact definition is the conversion of classic techniques involved in logistics processes in an upgraded method with the backup of network-related techniques. Even though we use network in logistics, it will not conclude it as e-logistics, yet it is a collaborative thing including manufacturers (distributors), logistics centers, resellers, carriers, consumers all over these things the process of exchanging data through electronic media or other ways of networks include cellular and wireless things for reducing crisis and to make perfect decision-making system.

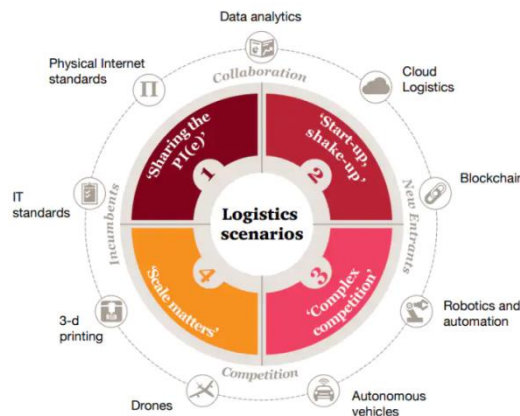


Fig.1 Logistics Scenario

We can witness four sketches of logistics development along with the power for improvement. And the things involved in this are cloud computing, robotics, automation and implementation and compliance with current ICT standards, which are reputed elements in logistics. The concept of “sharing” is presently evolving in logistics –

applying Uber-style approach as well as last-mile delivery for several joint ventures and deals in the level of corporate, and the entire thing is redefining collaboration. Most items are delayed by inconsistencies, e.g., shipment assures perfect stuff for a segment with a high standard in the operation of logistics.

E-logistics in use

Here tools and description of e-logistics with its example is described in an elaborated way as follows:

A. Cloud in logistics

Cloud computing is presented there for using the network in the process of accessing data like information and things related to it. These kinds of things are happening to avoid depending on computer systems for users yet; they can access data from their place at the time of being away from their gadgets. So these things are possible as the users are accessed with networks by any more devices.

B. Mobile Logistics

This form of mobile logistics is encouraged by the users as it is an easy thing to take with them anywhere for their easy work done. With mobile, we can shop items through a variety of products by browsing. Industrial customers are treated equal to an individual customer, and their shopping has done in a fair way similar to the later one at a low cost.

This kind of online purchasing makes the customer access the information of goods from placing an order until the happening of delivering the purchased. And this kind of availability of information regards to buying things is considered as a regular happening. This form of shipping has needed for B2B (Business to Business) and B2C (Business to Client) levels.

Cellular remedies regarding logistics provide these features:

- Solutions for managing mobile warehouse: knowing every aspect of the warehouse.
- Remedies regard door delivery: increase the time of the door deliver system.
- Remedy for finding mobile asset: it has rectified with the knowledge of exact LA ale of shipment.
- Remedy for the mobile fleet: collect the vast from fleets.
- Customer services: remedy the requirements of the modernized customer.

The things as mentioned above are there in the features of the various world' s reputed logistics firms, and they are also providing the facility of having an android application for the customer services for the IOS operating system on play store, under apple inc. Figure 2 depicts the transportation app, and figure 3 describes the app regard shipment.

 CMA CGM	 17 TRACK ALL IN ONE	 TNT TRACKING
 MCC TRANSPORT	 SAFEMARINE	 DELIVERIES PACKAGE
 UPS MOBILE	 PARCEL TRACK	 ESEAGO

Fig. 2 Transportation Applications Available on Google Play

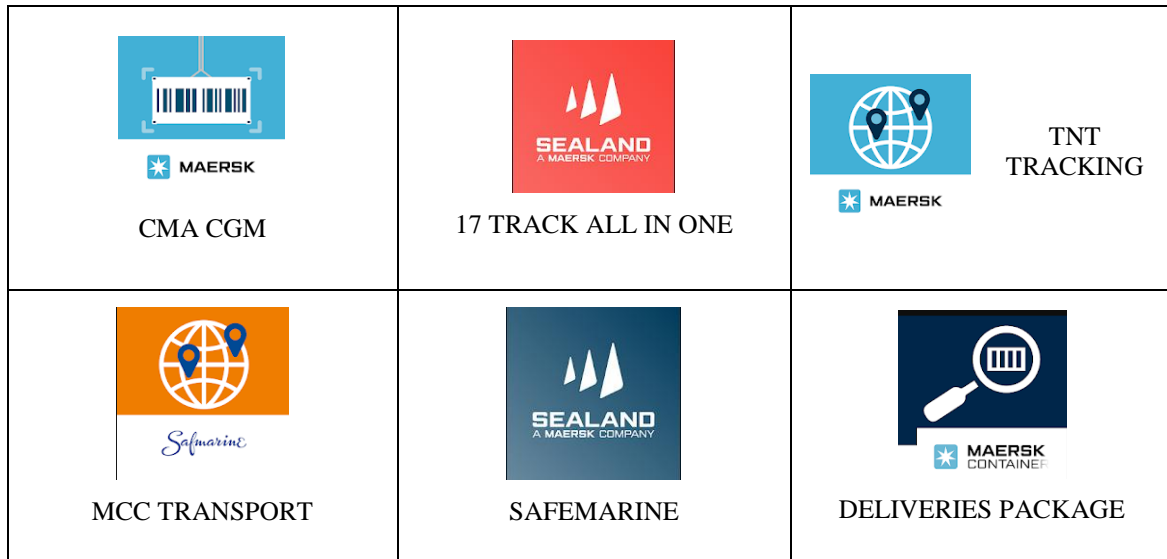


Fig. 3 Shippers Applications Available on Google Play

C. Mobile Supply Chain Management

Mobile gadgets and internet services have used in this supply management for fast and fair business, e.g., in this oracle application guide the user to access several warehouses and shop floor transactions with mobile gadgets by providing real-time transactions with exactness in data along comforters.

D. Digital Twins

These are just a reflection of virtual software regards the goods and things preferred for sales. It was predicted by Gartner around 2021, and almost all reputed firms used this, and they achieved 10% of improvement in their work. In case change in atmosphere or conditions regarding the shipment, this process of e-logistic gets delayed, due to traffic, etc.,































These digital twins have used in e-logistics under situations like, in the process of making a decision with profit along with minimal risk factor; these are the things done in the digital twinning of e-logistics and supply chain which was there in the business process. Computerization is the pioneer of this process, and it is contradictory to the traditional method, and the things are carried very carefully without any drawbacks. As mentioned earlier, this process encourages a healthier competition among companies, so the customer can pick up they are upcoming on digital twin presented.

The components of the digital twin are there with all kind of supply chain operators in place-MES (Manufacturing execution system), SCM (supply chain management), ERP (enterprise resource planning) and CRM (customer relationship management) software. These are made possible to look upon happenings like logistics, procurement: and customer's need.

With the usage of Geographic Information System (GIS) we can track the locale of goods and shipment. Few are making use of this system, and fulfill the needs of a digital twin with the supply chain.

E. Industry 4.0

Just as industry 4.0 is holistic, with a partial transfer of autonomy, intelligence and autonomous decisions to machines, supply chain and logistics in industry 4.0 is very similar, albeit with, on top of the overlaps, different applications, technologies, human and business aspects and elements.

Industry 4.0					
Logistics					
Supply Chain Logistics	 Local Operating Structure	 Global Operations Structure	 Partial Global Resource Planning / Controlling	 Complete Global Resource Planning / Controlling	 Open and Flexible Operations Footprint
Inbound Logistics	 Push Delivery Process	 Pull Delivery Process / JIS	 Vendor Managed Inventory	 Autonomous Inventory Management	 Predictive Inbound Logistics Management (Big Data)
Warehouse Management	 No Automation	 Automatic Warehouse System	 Automatic Warehouse Network	 Supply Chain Warehouse Network	 No Warehouse in Supply Chain
Intralogistics / Line Feeding	 Manually steered rack, trolley	 Manually steered train	 Autonomous FTS on fixed routes	 Autonomous FTS on open area	 Autonomous FTS on open area steered by production machine
Outbound Logistics	 Push Delivery Process	 Order-Based Delivery Management	 Active Delivery Management	 Automatic Delivery Management	 Predictive Delivery Management
Logistics Routing	 Decentralized Vehicle / Equipment Fleet	 Centralized Vehicle / Equipment Fleet	 Pre-planned and Centralized Fleet	 Real-Time Routing and Connected Navigation	 Autonomous Transportation Vehicle / Equipment

Source: Smart logistics and supply chain – the road ahead according to UNITY Consulting and Innovation

Fig. 4 Evolution of Industry 4.0 in Logistics

Industrial evolution is pictured there in fig 4, explains the progress of the warehouse and how it exists without even there is no warehouse. SCM is a local operating system to perform any kind of work with flexibility. Logistics routing is an example; in this autonomic vehicle are considered for no longer life.

F. Autonomous Vehicles

Autonomous elements are the general features of the warehouse; through conveyor belt with its flexibility, they transport the goods in the space of the warehouse. Advanced sensor and global guidance techniques has needed for this. Besides this, warehouses this kind of vehicles is utilized in airports, harbors, and yards. Here the role of the trucker is highlighted, and that will not be in trouble, and it is given a primary place in working.

In amazon, Kiva robots are autonomous vehicle operation. And it works as a car in a toll booth, at the of customer placing an order to it.

Innovation in logistics

Innovation, these includes the development of new products to rectify the preference of market. It is a developing technique with the possibility for development. And its features and techniques ate described as follows

A. Internet of things and internet of everything

The industrial internet of things (IOT) is predicted that it will gain \$123.89 billion around 2021 (18). Internet of things works on the basis of computing products in internet. IOT, a component of internet of everything (IOE). So it get in hand with every M2M (machine-to-machine) communications in IOT, besides the interaction of machine-to-people (M2P) and technology-assisted people-to-people (P2P).

B. Start –ups

These kind of introductory entrants creates the great effect. in the form of start-ups make a bigger impact. It is too challenging and creates a kind of fusion like crowd-sharing solutions by exploiting new technology. It joins with incumbents then gain applause for its service. For around a week, new digitalized logistics is invented. The important start up clusters over rule the landscape are online platforms, asset

management solutions, robotics/autonomous vehicles, shipping executing & tracking, and data and analytics solutions. Shipping carriers include transportation of goods and delivery of it in a clear way without involving in any issues. For example, clearmetal is beginning process to help industries to overcome hurdles like placing ocean containers and planning. It saves millions for reputed logistic providers.

Darkstore, a demanding delivery 3PL, it provide e-commerce shipment in a day with minimum cost. Apart from having space for them, they have things as malls, and bodegas. It avoids charging for e-commerce except 3% of its value while discarding the place.

Opensea, a primary place for marketing by finding an exact vehicle and goods for their business transportation. It flourishes in shipping, it is obvious to see betterment in future for higher needs.

C. 5th-party Logistics

5th-party logistics (5PL), it promotes logistic to e-business.(23). Its provider increases the needs of 3PL and others to neglect the transportation mode of shipping firms and its work is endless in every domain.

Its main ethic is to be committed with others and to obtain their target in an absolute economic way without facing downfall.

D. 3D Printing in Logistics

This aspect is in usage in every sort of business from small to peak of logistics. Mattel corporation has started a project with this, in that their users can design the toys of their wish in their wireless gadgets and get print in a 3D modules.

It has its effect on the work of SCM. Through these things it has great influence in manufacturing process, and ends with the expectation of role of supply chain in it. DHL and DB schenker were working in the same aspect, with the consideration of print-on demand mode in business. Spare parts, will increase firm's values and rectifies crisis as well as interfaces.

It replaces the spare parts in warehouse and promote their business at the time of demanding and cope with the need of users at times. To obtain the goal of company in a assigned time its preferred to use 3D, and it make the process easy and enable delivery in perfect timing.

E. Drones

It is being used by logistics providers to reduce the amount as well as overcome the I competitors as they are fixed with this delivery as old logistics firms. And this type of delivering process is common and even traditional and there are even problems to clarify in it. And antonymous things as well as customers approval is concerned.

F. Virtual Reality and Augmented Reality

Virtual reality (VR), means as reality in virtual space with the aid of computerization its is guided by other technologies like VR headset, to feel the VR through providing the sense of hearing and visualizing. AR (augmented reality), it will not provide reality yet it provide everything in an experience. Game pokémon GO, is the fine example for this; here user's gadgets (mobiles) are the VR element; here reality is fused with the game; this is also applied in logistic works like transport and warehouse process.

In the final stage, in case numerous customers expecting valued shipment ; so the dealers prioritize these things. DHL trend report says, the truck driver takes 40-60% of timing for placing a delivery, and drivers ought to be aware of the loading. This timing will be managed through AR application and deliver freight within the economic time period.

G. Blockchain technology

Blockchain and Artificial Intelligence (AI) has its impact on logistics. It provides privacy to store data at the time of checking authentication. It is just a digitalized process of proofing the customer at the time of delivery with block chain form. So, this block chain and AI will simplify the transactional process through digitalizing the data of customer and it will obtain one fourth of its requirement around 2021.

Growth of technology is leaping over hacking economy of an individual. And this technique will be applicable for every asset of exchanges, bonding; it is simple yet extended to automated cold chain management.

Conclusion

Manual works are aimed to has replaced in a concise span, and AI and technologies will do it. It creates the need for a robust workforce, which should be developed to maintain both hardware and software and it is needed to motivate the experts to cross their limits in this work; that will lead to perfect inventions.

By crossing and expanding the limits e-logistics will grow as 3D printing VR logistics, things have done through software including minimal transportation, and this concept of 3D printing will change the shipment process. It also promotes Business to Business trading by clarifying the needs through 3D templates which have designed previously. From manufacturing to logistics Industry 4.0 will utilize VR and AR, yet it costs high. So it will take time to launch in a wide business process, but not AI vehicles like robots are there in use. Amazon is using its kiva robots even for the outdoor process, and it becomes easy to handle their work and maintain the standards. There will be a domination of start-ups in the process of discovery in every field. AR, AI, the blockchain, and automated vehicles have invented, and still, it undergoes several tests to find its various features, yet it needs time to standardize its exact impact in logistics. Till that 4PL, m-logistics, MSCM, digital twins, and cloud computing get improved faster in every aspect of logistics with high standard.

References

- Deryn Graham (University of Greenwich, UK) Introduction to E-Logistics and E-Supply Chain Management,
DOI: 10.4018/978-1-4666-3914-0.ch001
<https://www.i-scoop.eu/industry-4-0/supply-chain-management-scm-logistics/>
<https://www2.deloitte.com/us/en/insights/focus/industry-4-0/automation-logistics-and-distribution-talent.html>
https://en.wikipedia.org/wiki/Industry_4.0
<http://logisticsandfintech.com/what-is-e-logistics/>
<https://www.igi-global.com/dictionary/logistics-slowly-evolving-platform-undrepinning/35801>
<http://www.reliantlogisticsinstitute.com/2018/12/14/what-is-the-process-involved-in-e-logistics/>
https://www.researchgate.net/publication/301560016_E-logistics_an_introduction
<https://www.quora.com/What-is-e-logistics-How-it-is-different-from-logistics>
<https://www.mbacrystalball.com/blog/operations-management/logistics-scm/>
<https://www.supplychainopz.com/2012/04/what-is-logistics-and-supply-chain-management.html>