

Service Logistics –

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**Critically evaluate the effect of technological
application into global logistics as an innovation for
achieving competitive advantage**

Service Logistics (M6X01294)

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Introduction

The evolution of technology is pushing the boundaries and changing how the world does business (Shapiro). Since the beginning of the 20th century, logistics has experienced many changes and improvements thanks to technological innovation and technical progress. This technological progress opened a lot of doors for the logistics sector and allowed progress in these areas in a very short time.

Logistics has always been there, since the construction of the pyramids in ancient Egypt (DHL), but this sector has been most specifically develop at the beginning of the 20th and principally through the World War II , where logistics have been develop for the needs of the army, and thanks to the road development which have been accelerated during this war too.

Today, logistics is everywhere as technology, and they are both essential for practically every type of business, combined they can be a source of advantage for organizations. Nowadays, logistics has nothing to do with 1940 logistics, transport have been develop and today intermodal transport allow more solution to move a product from point A to a point B. In the coming years technology and logistics will be brought to evaluate together, but with sustainable stakes due to the environmental issues and the preservation of ours planet.

In our society, organizations must have to be always attractive and competitive to survive, a lot of them find solutions thanks to logistics and technology by reducing their cost through offshoring or by substitute unskilled labour by machine. That is why, this report will be focused on the technological application in logistics areas to achieve a competitive advantage for organizations and what can be this advantage.

To achieve this aim, it is essential to define in a first time what is global logistics, its history and the development of this sector, to see what it is today. Then I will present what is technological progress, before studying its evolution and his impact on the business industry and the planet. Finally, I will make the link between the technological application and competitive advantage in the global logistics sector.

1. Global Logistics

1.1. Définition

According to Lukashevich V. “Global logistics as a modern stage in the periodization of this type of activity is realized on the basis of a certain concept, including economic, organizational, spatial geographical, technical, technological, personnel, financial, political, moral and ethical aspects and characteristics, as well as factors and driving forces of development. “ (Vitaliy Lukashevich). So, global logistics include many different factors which have to be managed thanks to technical tools and human management in order to obtain a competitive advantage for organization and transforming logistics operations in a source of profit.

Most globally global logistics include flow of resources and information between a supplier and a customer. The person who is in charge of logistics operations has to manage how the resources are acquired, stored and transported, to be efficient this process requires a precise analysis of a company’s entire supply chain. To simplify, “global logistics refers to the management of the flow of goods or services between the point of creation and the point of consumption” (Staff Writer, 2020).

1.2. History and development

Beginning of logistics as we know it, can be situated in the 1910s with the foundation of industrial engineering by Henry Ford. But this sector has been developed more than ever during the II World Wars because of the army needs in terms of war materials which have to be transported from the production location to the battlefield as rapidly as possible, and also thanks to the road development which have allowed to transport the materials in this zone.

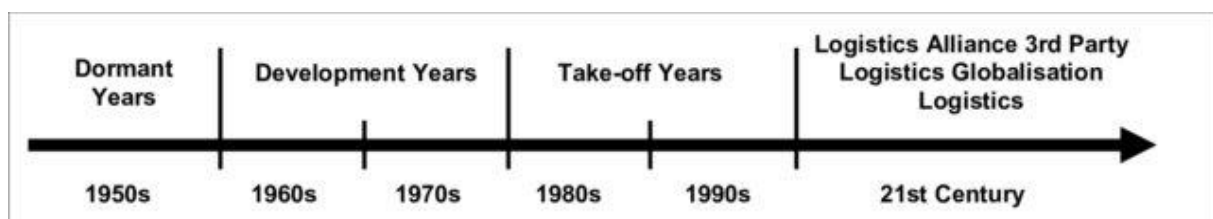


Figure 1 ; Logistics Historical development (Tseng et al, 2005)

Years after years and thanks to the technical innovation, logistics has become an integral part of the modern production process and is now established in every type of organization (Tseng et al, 2005). Nowadays the concept of Third Party Logistics (3PL) became usual in organizations which are not specialized in logistics to achieve a competitive advantage thanks to the outsourced logistics operation.

In the future logistics will continue to grow with the discovery of new technical innovation and most generally thanks to the technical progress.

1.3. Mains Objectives

Logistics objectives are clearly defined in its definition, managing the resources from the point of consumption to the final delivery by the most efficient way as possible. But today, logistics has taken another dimension with the concept of 3PL, organizations have realized the stakes of an effective logistics chain for the competitiveness of their business and started to develop this sector with the aim of developing a competitive advantage compared to their rival.

Global logistics is now a key factor of success for companies and requires the use of high technology to be effective, technology are also developed in the aim of improving the logistics performance, which allow a continual progress of this sector.

2. Technical progress

2.1. Definition

Technical progress can be divide in 3 phase :

- The invention: Is the act of creating a new technology or a new tool which will have a utility for organization or people, thanks to a scientific research or a new technical progress, the invention must be patentable and novel (CFI).
- The innovation: This term refers to the discovering of a new way to use or apply a technology which is already existing. The innovation is the fact to use a technology to develop a new use for its potential adopter (CFI). Innovation aims are often used to develop a competitive advantage for company.

- The diffusion: Diffusion is the last part of technical progress or innovation. The technology is diffuse and available for society or industry, the new idea, product is accepted by the market and started to be commercialized. According to Everett Rogers, the diffusion is accepted by people in order to best suit their own needs or desires (CFI).

2.2. History and development

According to Robert Angus Buchanan the terms technology appeared in England in the 17th to talk about applied arts, and gradually these “arts” themselves came to be the object of the designation. Around the 20th, the word technology has been developed as we know it nowadays, it means, processes, ideas, tools or machines. By the mid-century, technology was defined as “the means or activity by which man seeks to change or manipulate his environment” (R.A Buchanan).

Technology history is difficult to define because technology has always existed, it just developed around the years with technological progress. Technology will continue to evaluate in the coming years with the development of new tools, machines or simply with innovation.

2.3. Impact

Technological progress has allowed a lot of things of positive but also negative. Today sustainability stakes are more present than ever and organizations have to deal with, but the most productive and efficient models for companies aren't often the most sustainable. Technology application or production can use non-renewable resources or even chemical products, that is why this part will be especially focused on the positive and negative impact of the technical progress in our society.

2.3.1. On organization

The first positive impact of technical progress on organization is to reduce cost. For a few years, we have seen companies substitute unskilled manpower by machine to save money. Most generally thanks to the technical progress and innovation organizations have developed the possibility to achieve competitive advantage. Technological applications have also changed the way to manage organization, by increasing the importance of decision making, control, coordination and planning (James P. Golson, 1997).

Another effect of the technical progress has been to increase the knowledge and capability of employees, low-skilled post being eliminated to use machines, people started doing longer study to be more qualified and to meet the organization demands.

2.3.2. On earth

The negative impacts of technology development are mainly felt on the earth and the environment. Technology development has increased the utilization of non-renewable resources as fossil fuel consumption, which are very polluting and difficult to recycle (Sergio Lopes, 2018).

The possibility to buy something anywhere in the world from a computer has also an ecological impact, the development of logistics has also increased the number of transports to deliver goods that come from all over the world. This increase of transport is polluting our oceans and forests, which is not sustainable, while e-commerce continues to increase and be developed, the question of a sustainable model is becoming more and more serious.

3. Technical progress into logistics

3.1. Application

Technology has played a key role in logistics history, both have been developed across years and logistics has always used technology to become more efficient. Consumer demand has also changed and consumers are becoming increasingly demanding due to the development of e-commerce.

The application of technologies within the logistics have enabled the removal of unnecessary or repetitive stains in order to focus on more specific and organizational aspects.

Technology is ubiquitous in logistics, like in warehousing, transportation or order information management, different techniques are used and companies have the choice to best adapt their operation to their needs.

Today many companies are bringing their manufacturing plants closer to their customers in order to reduce transport costs and get closer to their consumers. This model is possible thanks to the implementation of machines to reduce labour costs. The main objective of

technical application into global logistics is to develop an advantage for companies rather than their competitors by reducing cost, errors or waste of time, the RFID is one of this technology, which has an objective to improve the logistics operation of an organization.

3.2.Third party Logistics

The Third Party Logistics (3PL) have revolutionized logistics by offering a quality service to the non-specialized company in order to subcontract their logistics operations so that it can remain focused and efficient on their main objective. 3PL has digitized warehouses and implemented systems to better manage resource flows within an enterprise (Francois Duchesne, 2020).

The appearance of 4thParty Logistics Provider goes even further than the 3PL by managing information flows. They offer software or computer applications adapted to the activities of a distribution chain, their purpose is to help the three usual types of actors: the loader (1PL), the end customer (2PL) and the logistics provider (3PL) planning and coordinating information flows between them (Francois Duchesne, 2020).

So 3PL and 4PL objectives are to help companies to focus on their core business while offering them a service that allows them to achieve a competitive advantage in terms of logistics management compared to their direct competitor.

3.3.RFID system

3.3.1. Definition

The Radio Frequency Identification (RFID) consists of a tiny silicon computer chip and an antenna, this small electronic tag transmits data via a radio signal to RFID reader and related software and hardware. These tags, which can be pasted or incorporated into products, react to radio waves and transmit information remotely, tags can be mounted to a wide variety of surfaces including polyester, nylon, rope, wire and steel.

3.3.2. Principle and systems

Each chip can give a unique serial number to every product and its antenna helps remote scanners read the RFID tags, scanners read the information through materials like fabrics, wallets. The RFID can tell, what the product is, where it has been, when and where the product is manufactured, picked, packed, and shipped, the expiration dates, it also can be read automatically by electronic readers.

The RFID system also serves as proof of delivery for the supplier through tracking and tracing of the merchandise, it also stores the information of what is delivered and where it is stored. This system allows error-free traceability throughout the entire supply chain, which is very important, in the process of reducing waste of time and errors for companies, which allow to save time for other tasks.

The RFID provides visibility thanks to data video image which allow an higher visibility of the supply chain and facilitates the claims for transport damages or losses because RFID give the location of the product and current condition at the moment of the delivery and every product is tracking, so companies can find the product's path with these labels and determine where the product has been damaged.

RFID is also a solution for inventory and inspection thanks to the information stored on the tag, which eliminates the physical paperwork and human error associated with human and manual processes. Furthermore these tags are designed to resist harsh as a high-volume of physical abuse, shock, UV radiation, temperature variability and moisture, they are therefore suitable for almost any type of product in any type of industry.

3.3.3. Limits

Like most technologies, RFID has limits for example the item must be within range of the sensor and with no interference (metal, liquid, walkie-talkies or nylon conveyors), it only communicates data programmed in the chip and only those items that have passed through a location. As every product, RFID tag present defect, estimated that 20% of tags don't function properly.

Conclusion

Technology and global logistics are two sectors which have been developed a lot during the 20th century and continue to be developed. This technical progress has helped many companies to find solutions in order to remain competitive and productive, RFID and the 3PL have both for objective to help organization for logistics operation and limited the waste of time and the errors in this area.

Technical progress brings many positive things but also negative, especially on the environment, the needs of technology have used a lot of non-renewable and bring pollution, in an areas where sustainability stakes are more important than ever, the question of the future is omnipresent. Another limit of the technology is the reliability, as we have seen for the RFID, technology is not perfect and without error.

To conclude, global logistics will continue to evolve with the technology, new tools and systems will be found and organizations will have to get the best way to use technology to meet their need to be as competitive as possible. The sustainable stakes will also play an important role in the coming years with the importance of environmental conservation.

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