

Service logistics

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

Service Logistics (M6X01294)

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Abstract

This report will discuss about the competitive advantages provide by technology innovations in logistics field. In the fist part it will describe the benefit of the big data for companies. After, for the second part it will show the advantages of the usage of drones. Then, in third part it will take one example of automation in logistics with the storage and retrieval machine. It will finish, with the description of the benefits for firms of RFID system.

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Introduction

Logistics is defined by Mangan as “the process of planning, implementing, and controlling procedures for the efficient and effective transportation and storage of goods including services, and related information from the point of origin to the point of consumption for the purpose of conforming to customer requirements. This definition includes inbound, outbound, internal, and external movements.” (Mangan, 2012).

An efficient logistics results to obtain the right product, in the right quantity and quality, in the right place at the right time with the right cost.

The logistics is not a process which gives more added value to the product therefore his optimisation is needed to reduce the waste of money for companies and create an added value on the service gives to customers. Also, these last centuries companies understand the importance to get logistics which is more efficient at the lowest cost possible because it allows having a competitive advantage over the competition (Vijayan, 2020).

Porter had defined a competitive advantage “in terms of lower cost and differentiation, and stated that strategic management should be linked with building and sustaining competitive advantage of a firm.” (Porter, 2004).

Companies could obtain a competitive advantage when they increase their productivity, with the new process, implementation of new technologies for a task which allows outperforming compared to their competitors so the economies of scale will be enhanced and create advantage (Vijayan, 2020).

Technologies are increasingly present in human life and industries. Companies use them to improve the quality of product or service, the productivity could be enhanced in factory or warehouse and technologies allows making faster deliveries. Also, technologies should be implemented for the creation of new products which meet the needs of customers (Beheregarai Finger, 2014).

The technologies were view as the major lever to improve the logistics activities efficiency by 34% of logistics executives (Patterson, 2003).

Therefore, the first part of this report will show how the usage of big data in the logistics field gives concurrent advantages. After, the second part will describe the advantages of drones usage. The third part will describe the advantages of automated storage. The last part shows the benefits of RFID tags in logistics.

1. Big data

Big data “is high-volume, high-velocity and/or high-variety information assets that demand cost-effective, innovative forms of information processing that enable enhanced insight, decision making, and process automation.” (Gartner, n.d).

These data could be GPS data, meteorological information, the transaction between seller and customers, environmental condition of products, driving patterns, advertising response data, vehicle diagnostics... (Bremme, n.d). This information evolves, change, are store in server and stream data in real-time at the human who can analyze them or at software which can make suggestions for the worker (Lebied, 2017).

The use of data has improved the efficiency of the operations, the satisfaction of customers expectations and the benefits for companies.

1.1.Examples of application

Nowadays, big data are used for last miles delivery by huge companies like Amazon, UPS, FedEx, DHL or others... They use the tracking system with a GPS sensor on the truck and with the mobile phone of the delivery man’s stream data to a centre which store information (Lebied, 2017).

These data enable to set achievable objectives of delivery ; also, know where the worker loss time and to find solutions which allow being faster. In huge cities like London, New York or Paris, the creation of smaller distribution centres in neighbourhoods where there is a lot of demand. It enables to reduce the time of delivery because of the use of smaller trucks which can access easier at certain areas therefore decrease the wasting time for delivery man’s (Lebied, 2017).

The GPS data and information collected about the traffic and tailback enable to avoid tailback or road temporarily shut down therefore deliveries time is enhanced. In 2016, through the analyze and well use of these data UPS had reduce his use of fuel by “10 million of gallons of fuel” and reduce the numbers of delivery trucks by 1 110 and the delivery route by 28,5 million miles (Lebied, 2017)

Also, customers can follow the position of their parcels during all trip if the bar code is a scan at each stage of storage, handling positions and share on the delivery account website. In addition, customers applications allow tracking the parcels through the GPS sensor on the truck (Lebied, 2017).

1.2.Data from sensors

During the transportation step, the usage of sensors could be essential for the safety of food and avoid spoilage. The temperature, humidity and pressure could be monitor with sensors which that send data to the control centre. During transport, if one indicator is not in a good range it is possible to recover it with the repairs of a motor for example or redefine a closer destination than before. It might avoid spoilage of food on a long trip which causes loss of money for the company. Moreover, sensors give information in real-time to the customers which can control the quality of products during transportation. These sensors enable to reduce return due to spoilage of food and reduce wastes treatment for the seller (Cloud Hawk, n.d.).

2. Drones

A drone or Unmanned Aerial Vehicle (UAV) is a passenger- and pilot-free aircraft that can fly autonomously or be remotely controlled from the ground (Futura Science, n.d.).

The drone is one of the most interesting new technologies in the logistics and transport world due to its quickness and its capacity to fly. Leaders of the logistics field are investing and trying to develop even more the drone for tasks like inventory or delivery (Sunol, 2020).

Moreover, a project of drone that can study the soil composition with a specific camera for better usage of fertilizer on accurate location and with good quantity is under consideration (Shacklett, 2018).

2.1.Inventory

The drone is very useful in logistics, particularly for the inventory in the warehouse. It enables us to gain a lot of time because it can work autonomously and scan bar code on pallet or parcel

box. It is faster than human for the collection of information and his capacity of flying enable to reduce time by five of this collection because it is not necessary to move on the mobile elevating work platform (Hardis Group, n.d.).

Furthermore, it decreases costs because it is not necessary to have many workers for this task of count up the products which is troublesome for them. The drone can transfer data in real-time at the WMS or ERP of the company to adjust the level of stock. In addition, it improves the quality of inventory due to the reduction of human errors and the inventories could be made more than one time in the year, easier than with workers (Flytware, 2020).

2.2.Delivery

Amazon is the most closer company which will introduce delivery drone at large consumption due to the size of parcels that it transports for last customers (Cooper, 2015).

One advantage for the company is to reduce costs due to the usage of fuel because the drones use an electric motor which is fewer expensive. In addition, fewer vehicles are needed and delivery man's at the same time therefore deliveries will be less costly because of the reduction of wages and reduction of purchases for trucks delivery. These advantages allow decreasing the cost of delivery for the company consequently for the consumers (Sunol, 2020).

Today, the operation cost delivery for a product which made 4,4 pounds will run over 10 kilometres by road is approximately evaluated between 2\$ and 8\$. The same product and the same run with a drone will cost 10 cents (Cooper, 2015).

Another advantage is to be able to access more areas for deliveries because it is easier and faster by air. Also, the reverse logistics could be optimized when the drone had delivered a parcel it could bring at the same time a product that is in return procedure (Sunol, 2020).

Amazon is a closer logistics company to be able to really introduce drone for customer delivery through its research and development service. If they are able to ship the parcel by drone, "their shipping costs by approximately 83%" and the delivery service could be estimated at only 1\$ which gives them a huge advantage over competitors. Nowadays, all other delivery companies like Google Express, FedEx, UPS and USPS offer service between 4,99\$ and 12,92\$ for delivery on the same day from the order for 5lb package delivered within 10 miles (Sunol, 2020).

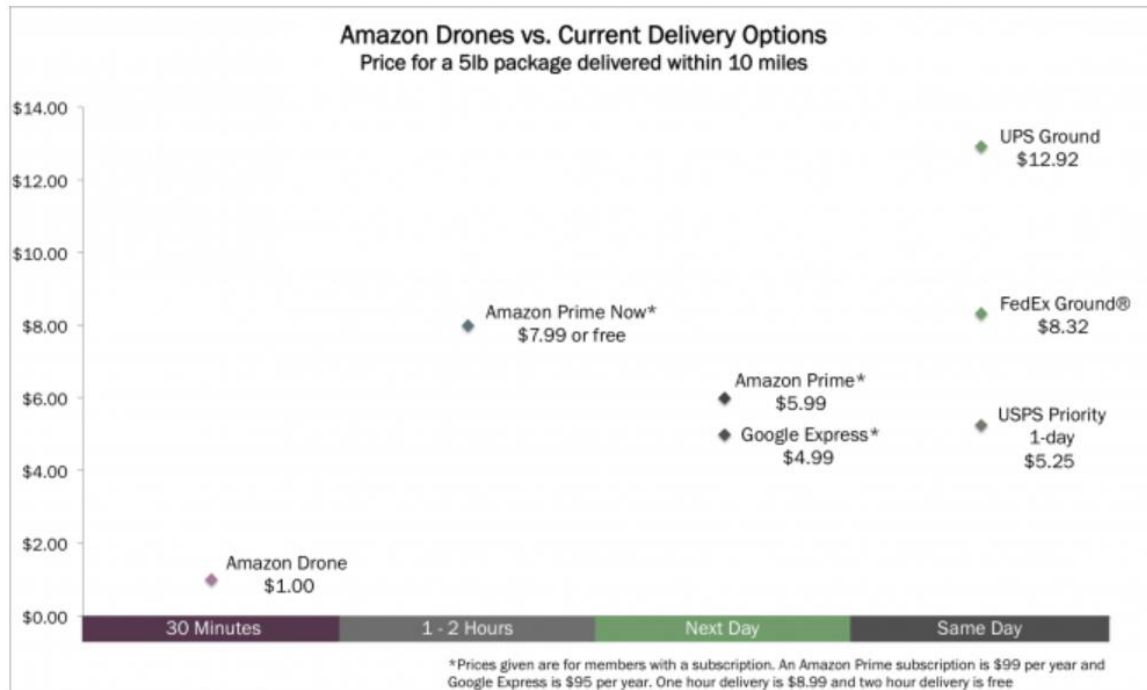


Figure 1 - Graph of delivery option according to each companies

3. Robotic in Logistics

3.1. Automated storage

The storage and retrieval machines (SRM) is an automatic system of storage in warehouse. Usually, this type of automation with pallet but it could transport cartons and small containers too. This technology enables to optimize at maximum the capacity of storage because it reduces wasting spaces between shelves for the human pathway and keep just place for the passage of one pallet. In addition, the StoreWare allows to achieving efficiency for the storage space because it knows exactly the location of each pallet and where are the free space (Gebhardt, n.d.).

3.2. Benefits of Storage and Retrieval Machines

The automation of the operations of handling enables to gain a lot of time and precision because storage and retrieval machines are faster and accurate than the human, therefore, decrease wastes due to damage of products. The level of inventory is updated in real-time

with pallets input and output so it reduces the time of inventory and costs due to the wages of worker for this task. The customer's satisfaction is better than with classic storage with forklift trucks because it is faster to deliver products with the SRM and in emergency case the request of a client, machines could prepare the order almost entirely alone if it receives references of pallets (SSI Schafer, n.d.).

Also, the SRM reduces the difficulty of working when it is implemented for frozen products because workers have not to work with many items of clothes on them which make harder the task of handling products and pallets. Thus, companies reduce the wages pay for the arduousness bonus of the work. Also, materials like shelves will be use longer than with human work because there is no damages with the accurency of the robots. (Trans Info, n.d.).



Figure 2 - Storage and Reteival Machines

4. RFID (Radio Frequency IDentification)

The RFID is a tiny silicon computer chip and antenna. It is easy to implement on tag product or on the packaging of merchandise therefore it is possible to mount it on polyester, rope, wire... When a scanner will be in a closer range of the tag it transmits data via a radio signal to an RFID reader and related software and hardware.

4.1.Inventory

The RFID tags enable to be aware of the accurate level of stock in the warehouse because every input and output could be monitor with an electronic reader. Place of products could

be controlled and correct easier if one has been misplaced. That allows to reduce time and cost and inventory of classic inventory made by the employer and gives accurate stock of storage. The need for manual interventions to scan bar code is not necessary with these tags thus it reduces damage on items because there are less manual operations (Core RFID, n.d.).

4.2.Traceability

The RFID transfers data to the company software when it is scan. This enables to know where and when products moved from the facilities and when they are transported. Customers can follow more precisely the place and know the time of delivery for their parcels on their computers. The tags give proof of delivery on each step of the merchandise trip and they could transfer information on the product (Core RFID, n.d.).

These advantages enable to increase benefits because they reduce the time off work on certain tasks. The level stock is known and avoid over storage or lack of items. Moreover, the spoilage date is follow on software with information transfer by the RFID and avoid wastes. Furthermore, there are fewer damages on merchandises because tags reduce handling for employees.

Conclusion

This report describes the many benefits of technological innovations implemented in logistics which could give competitive advantages for companies. The usage of these technologies enables to monitor of the environment of a product during transportation, follow the place of merchandises in real-time and forecast an accurate delivery time, after it is possible to collect information about items at the delivery with RFID tags.

Furthermore, the implementation of technologies reduces the loss of money due to wastes and damages caused by handling operations because machines are more accurate than human. Also, companies make the economy of scale because robots and technologies improve efficiency throughout the supply chain.

If all these technologies are combined they can give huge competitive advantages.

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