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## Research Article

# AUGMENTED REALITY IN SUPPLY CHAIN MANAGEMENT AND LOGISTICS

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### ABSTRACT

Today, the cost of doing business has increased by a large margin. This situation has resulted from the rise in energy costs and continued use of the old systems in running businesses. Companies are always on the lookout for ways through which they can save money and at the same time improve the quality of services (Cirulis, & Ginters, 2013). Emerging technologies such as Augmented Reality (AR) have provided innovative low-cost solutions to this problem. Since the kick-off of the digital transformation era several years back (Koul, S 2018), supply chain innovations are raging forward to provide cost-effective solutions to the community, and now the AR (augmented reality) is seen as a new biggest chapter in SCM world that helps to overlay information into the real world. Different players in the supply chain and logistics network including truck drivers, warehouse attendants, and different managers use this information to track goods from the moment they leave one point until they are delivered to the next one (Arnold, 2018). AR is progressively transforming logistics and supply chain from a traditional slow, paper-based sector to a high technology-driven industry. This paper discusses the fundamentals of AR technology in supply chain management and logistics, different areas of application and the challenges facing its application.

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## INTRODUCTION

Today, the cost of doing business has increased by a large margin. This situation has resulted from the rise in energy costs and continued use of the old systems in running businesses. Companies are always on the lookout for ways through which they can save money and at the same time improve the quality of services (Cirulis, & Ginters, 2013). Emerging technologies such as Augmented Reality (AR) have provided innovative low-cost solutions to this problem. Since the kick-off of the digital transformation era several years back (Koul, S 2018), supply chain innovations are raging forward to provide cost-effective solutions to the community, and now the AR (augmented reality) is seen as a new biggest chapter in SCM world that helps to overlay information into the real world. Different players in the supply chain and logistics network including truck drivers, warehouse attendants, and different managers use this information to track goods from the moment they leave one point until they are delivered to the next one (Arnold, 2018). AR is progressively transforming logistics and supply chain from a traditional slow, paper-based sector to a high technology-driven industry. This paper discusses the fundamentals of AR technology in supply chain management and logistics, different areas of application and the challenges facing its application.

### *The Fundamentals of AR Technology*

Through the use of sensors fitted on packaging materials, companies can carry out advanced analysis on their performance of their products in the market. In fact, a factory can be able to increase or decrease the production of various goods in real time based on the information relayed to them via the sensors in the packaging materials of their products. Data scientists and logistics experts working in the supply chain network are also able to generate new insights from the products regardless of their location (Chang, 2018). For instance, if the sales volume is as robust as forecast, manufacturers can use this information to decide on whether to cut losses by producing fewer products and distributing them in areas where the demand is higher.

Research shows that there are over one billion AR-enabled smartphones and tablets in use in today. Supply and logistics companies, therefore, do not have to wait for the development of low-cost AR glasses to be able to reap the benefits offered by this technology in their operations (Arnold, 2018). There are different types of AR technologies used in logistics and supply chain management operations today. These include marker-based AR, markerless AR, a projection based AR, and superimposed AR.

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Marker-based AR uses cameras and other visual markers such as QR codes to generate results once a given reader has sensed a marker. Distinct markers are put on packaging materials and can be scanned at different locations for the recognition of the particular details of the product (Merlino, & Sproge, 2017). Markerless AR has additional features such as location-based devices that are embedded on the devices to ensure that the position of the products is recorded. The most common applications of mapping directions are the use of smartphones to determine the nearest routes to a particular business. Both projection-based AR and superimposed AR are consumer-oriented (Merlino, & Sproge, 2017). They can both be used to improve business operations to fit the needs of the consumers.

### **Applications**

There are many areas in which AR technology has found a wide range of applications. These include pick and pack services, the collaborative logistics, maintenance services, procurement, and last mile delivery. Each one of these applications is explained in detail in the sections that follow.

#### **Pick and Pack Services**

AR is used in warehouses to locate products more efficiently and pack them in delivery packages. Research shows that one of the most expensive ways of running a packages delivery business is the training of new employees on how to navigate through the warehouse (DHL, 2014). AR technology through the AR glasses can be used to paint imaginary lines on the warehouses' floor to simplify the process of searching for packages. The holiday season is one of the busiest periods in the pick and pack services businesses. AR can be used to shorten the learning curve during this period. Employees can receive real-time feedback on their performance and hence make improvements where required. Studies have shown that the use of AR technology in picks and pack services has reduced the magnitude of errors by almost 40%. (DHL, 2014) Some advanced AR glasses can even be used to provide graphic overlays on various packages on the shelves thus reducing the amount of time required to identify the items that should be picked. Once the items have been picked, AR can be used to provide instructions on the delivery of these products.

#### **Collaborative Robotics**

Robotics is viewed as the future of AR. Workers supervising operations from their offices can use AR glasses to see what robots see while in operation. Robots, therefore, use AR glasses to chart their paths through the warehouse, move and lift heavy cargo. Some of the most strenuous tasks such as repetitive lifting and loading of trucks can be delegated to robots in order to attain optimum results. Robots used in logistics also use AR glasses to scan through the products for damage, weight assessment, and correctness of the shipping instructions (Chang, 2018). Through the connection of the robots with the managers, customers can, therefore, be alerted if any of the products ordered are missing before the delivery trucks can leave the warehouse.

#### **Maintenance Operations**

Prior fixing of problems before they could happen is considered one of the most cost-effective forms of maintenance. Cargo aircraft and delivery trucks are now

transmitting data using Wi-Fi. While on the ground AR is being used to assist the maintenance crew in reducing downtimes through the comparison of performance data from the past. Logistics companies such as DHL are using this technology to track the performance of their delivery fleet and hence make improvements where necessary (DHL, 2014).

#### **Last Mile Delivery**

The last mile delivery is considered the most expensive part of logistics. However, AR can help to save money by reducing the amount of time spent in the last mile delivery by almost half. According to DHL (2014), the company's delivery drivers spend at least 40% of their time searching for the correct boxes to deliver. Instead of having drivers memorize this information, AR can be used to identify, tag, and sequence this information, thus aiding the delivery process. AR can also be combined with Artificial Intelligence (AI) to help drivers navigate to the correct destinations. AR systems will record past experiences and drivers will, therefore, benefit from this information during delivery.

#### **Procurement**

The ledger capabilities of blockchain technology have been integrated with AR to bring about transparency and traceability in procurement. In the absence of an official procurement process, the entire logistics and supply chain network would end falling apart. One of the main problems experienced in the procurement industry is the distribution of counterfeit products. Through the use of AR, each shipment can be tracked from its origin (the manufacturer) to the intended destination. The availability of this information will help to ensure that the suppliers of various products take responsibility for their roles in the supply chain system.

#### **Challenges**

Despite the benefits realized by individuals and companies from the use of AR in logistics and supply chain management, there are also many challenges affecting its implementation. Lack of technology awareness among the employees and the customers is currently the main obstacle. The cost of training employees on the use of AR technology has also proved to be quite high thus making it quite difficult for smaller companies to adopt the technology (Merlino, & Sproge, 2017). Another obstacle is the high cost of the AR infrastructure. Because the technology is still in its early stages of growth and development, there are very few manufacturers of AR-enabled devices and hence the high production of the required equipment. Thirdly, companies are also dealing with the high cost of maintenance of the AR infrastructure (Merlino, & Sproge, 2017). Small sized logistics firms with smaller market scopes have therefore been very skeptical about adopting the technology.

### **CONCLUSION**

AR technology is progressively transforming the logistics and supply chain management sector. In the near future, it is expected that there will be applications that enable customers to scan, measure and estimate the weight and costs of various packages before they can be shipped. This will not only improve the quality of service but also reduce the costs incurred by logistics companies. As new developments

continue emerging each new day, AR will indeed transform the industry into a high-level technology-driven sector.

## References

- Andrew Arnold (2018). How AR And VR Are Revolutionizing The Supply Chain. *Forbes*. Retrieved from:  
<https://www.forbes.com/sites/andrewarnold/2018/01/29/how-ar-and-vr-are-revolutionizing-the-supply-chain/>
- Cirulis, A., &Ginters, E. (2013). Augmented reality in logistics. *Procedia Computer Science*, 26, 14-20.
- DHL. (2014). AUGMENTED REALITY IN LOGISTICS. Retrieved from:  
[http://www.dhl.com/content/dam/downloads/g0/about\\_us/logistics\\_insights/csi\\_augmented\\_reality\\_report\\_290414.pdf](http://www.dhl.com/content/dam/downloads/g0/about_us/logistics_insights/csi_augmented_reality_report_290414.pdf)
- Merlino, M., &Sproge, I. (2017). The Augmented Supply Chain. *Procedia Engineering*, 178, 308-318.
- Patricia Chang (2018). AR in Logistics and Supply Chain Management. Retrieved from:  
<https://arpost.co/2018/09/03/ar-in-logistics-and-supply-chain-management/>
- Koul S (2018) How to Achieve Six-Figure Benefits from Digitizing Paper-Based Supply Chain Operations. *J Inform Tech SoftwEng* 8: 244. DOI: 10.4172/2165-7866.1000244
- Sunil K (2018) Value Creation through Blockchain Technology in Supply Chain Management. *J Inform Tech SoftwEng* 8: 248. DOI: 10.4172/2165-7866.1000248

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