

UDC 658.78.011.1

**ENGAGEMENT OF AUTOMATION SYSTEMS AND ADVANCED ROBOTICS IN
WAREHOUSE LOGISTICS**

Sophia Zhigula

National Aviation University, Kyiv

Key words: automation, robotics, warehouse, supply chain management, logistics.

The history of logistics is also a history of automation, from the steam engine to the forklift to today's robotic pickers and packers. So today's fevered interest in new machinery, after a lull of several years, has plenty of precedent. Recent years have seen emerging trends in supply chain management that have determined a change in the role of warehouse and its related activities across the supply chain. Growing attention is placed on automation and advanced robotics. Although automation in material handling systems began in the early '60s and '70, nowadays it is no more a matter of fashion or innovation: deciding whether to automate or not usually requires a deep investigation both on the factors to be considered before automating and on the activities to automate among storage, retrieval, order picking or sorting [1].

Modern technologies let us understand that warehouses of the future will come in a variety of forms, but with a few common ingredients. Firstly, human operational handling of items in warehouses is increasingly being replaced by automated item handling. Extended warehouse automation counteracts the scarcity of human operators and supports the quality of picking processes. Secondly, the development of models to simulate and analyze warehouse designs and their components facilitates the challenging task of developing warehouses that take into account each customer's individual requirements and logistic processes [2].

Use of advanced robotics and automation systems can help enterprises to gain a competitive advantage through its competitors. By virtue of technologies response strategic decisions may satisfy the customers' needs in advance. Engagement of robotics in logistics processes leads to increase in delivery speed and decrease in human errors that in its turn will also increase customer satisfaction. Customer service is critical for maintaining and growing any business. The faster the company can execute operations perfectly, there will be more customers who will come back. Thus the company can turn its warehouse services into a competitive edge. Example of this kind of business planning can be UPS, as they use advanced robotics which make the process of customers' satisfaction more quickly[3]. Nearly 50% of almost 35 million sorted packages per day are processed using new more-automated facilities.

Fully automatic warehousing system is one of the basic trend of future intelligent logistics development. Intelligent warehousing robot is an important carrier connecting data, information and

warehouse. By machine vision, machine learning and related photoelectric technology intelligent warehousing robot complete cargo handling, sorting, distribution, storage, inventory, and improve the efficiency of goods out of warehouse. Relying on the big data of logistics industry, integrating the advance technology of artificial intelligence, so as to improve the efficiency of end-to-end supply chain and achieve intelligent logistics.

What is more, robotics also improve safety for workers. They take over the dangerous jobs that put your workers at risk. Now that robots can work side-by-side with humans, the robots can take the dangerous parts of the job and workers take over the rest, such as getting inventory from heights or carrying heavy loads[4]. In addition to warehouse safety, workers (and companies) benefit from an increase in morale as the mundane and dangerous jobs are taken off their plate. Many workers have a reduction in anxiety and stress when robots take over the routine and risky parts of their job. Instead, they concentrate on the more creative and collaborative portions.

The another example of usage the robotics technology is 2XL, a logistics company in Belgium, used automated guided vehicles to significantly improve their warehouse efficiency. Their large warehouses meant that workers were spending most of their time just moving from one area to the next. They decided to transfer that work to robotic technology. In addition to saving valuable time that people could use elsewhere, 2XL found that the technology meant they were able to work around the clock. AGVs work nights and weekends at the same cost it takes to operate during the day, which both improved warehouse efficiency and cut costs. The AGVs also only requires 8 minutes to recharge, which means they spend very little time out of commission[5].

Among the significant advantages of innovation, the main thing is that modern technological decisions facilitate human labor, free up time and energy that can be used for other, more creative purposes. But, humanity should always remember that technologies are created to serve people, not to replace them.

List of references:

1. Hamberg, R. (2012). Automation in warehouse development (Vol. 1). J. Verriet (Ed.). London: Springer.
2. Dallari, F., Marchet, G., Melacini, M., & Perotti, S. (2006). Automation in warehousing: when is it worth it?. *Logistics solutions*, 9(3), 23-27.
3. UPS targets low-cost, e-commerce shippers with deferred delivery [Internet resource]. – Access mode: <http://surl.li/ftxrk>
4. Azadeh, K., De Koster, R., & Roy, D. (2019). Robotized and automated warehouse systems: Review and recent developments. *Transportation Science*, 53(4), 917-945.
5. Warehouse robotics[Internet resource]. – Access mode: <https://www.logiwa.com/blog/warehouse-robotics>