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INNOVATIONS IN WAREHOUSE LOGISTICS ON THE EXAMPLE OF AMAZON

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This article is devoted to innovations as a way to increase the competitiveness of the enterprise, as well as to increase the level of logistics service and reduce costs. The article is also devoted to the innovative activities of Amazon in the field of warehouse logistics.

At present, in the era of rapid development of technology, companies need to constantly improve, because even the leader in the market of trade, or the provision of services, risks being left behind. Innovation plays a special role in the development of enterprises. The most active innovations are implemented in the company "Amazon".

Currently, "Amazon" is the world's largest e-commerce company, as well as the world's largest online marketplace. This e-commerce platform places offers from 3 million sellers, whose sales account for 60% of the total number of sales, 40% of sales are accounted for by the products of "Amazon" itself. About 350 million products belonging to 34 categories are presented on the company's site [1].

Currently, there are more than 185 Amazon distribution centers in such countries as: the USA, Canada, England, Germany, Spain, France, Italy, Poland, the Czech Republic, China, Japan, India, Australia, Brazil [2].

These distribution centers are called executive centers in "Amazon" itself. These executive centers are warehouses with an area of about 50-60 thousand square meters, where the goods received from sellers are stored, sorted, processed and collected in accordance with the needs of the consumer.

The innovative activity of the company "Amazon" is known for the introduction of innovations in the field of warehouse logistics.

One of these innovations is the use of a storage system, in which the goods are located randomly throughout the warehouse. The main rule while using this storage system is that two identical products can not be placed in adjacent cells. At first glance, this approach may seem strange, but it has a number of advantages:

– flexibility. There is no need to plan separate locations for new products when expanding the range;
– efficient use of storage space. The goods are placed where they are placed. There is no need to leave empty spaces to place the goods waiting for receipt there;
– high speed when assembling the order. Information about the required product is transmitted to the employee closest to the location of the product;
– minimization of errors when assembling an order by employees, since similar products are not located next to each other.

The successful operation of this storage system is achieved through the use of barcoding. Upon arrival at the warehouse, the goods receive their code and are sent along the conveyor to the nearest free cell, which also has a barcode. Upon arrival of the product to the storage location, the employee, using the scanner available to them, scans the product itself and assigns it a cell. Information about the product and its location is sent to the database.

After receiving an order from the consumer, the system searches for a suitable employee and transmits information about the required product and the cell in which it is located to his scanner. After that, the employee needs to scan the barcode, pick up the product, and then place it on the conveyor and get information about the next order. Each employee selects about 1000 products per day.

The scanners used by the warehouse employees also have a timer function. The countdown starts immediately after the information about the required product is received. This makes the employee work as productively as possible, since if the time expires, the information will be sent to the database and the worker may subsequently be penalized. It is worth noting that despite the high efficiency, this system forces the employee to work at the peak of their capabilities, which subsequently leads to high staff turnover due to lack of motivation, since there is no incentive for completing the task on time [3].

"Amazon" is also actively implementing innovative technical products that allow you to automate the procedure of processing orders in the warehouse. In 2012, Amazon Corporation bought out "Kiva Systems", a company engaged in the development and production of robots that allow you to move cargo in real time in accordance with incoming orders. In 2015, the company changed its name to "Amazon Robotics".

It is worth noting that Amazon warehouses equipped with robots "Amazon Robotics" use a fundamentally new approach to the process of moving goods in warehouses. In contrast to the traditional approach, where inventory items are moved around the warehouse using conveyors or loaders, the goods are located on special modules equipped with storage cells and moved by robots.

The company "Amazon Robotics" produces 2 models of robots: with a load capacity of 500 and more than 1500 kg. The speed of the robots is 1.3 m/s. The battery lasts for an hour, and it takes 5 minutes to charge it.

In 2015, the number of robots of the company "Amazon Robotics" in the warehouses of "Amazon" was 30 thousand units. Amazon Robotics products are not sold to third-party companies in order to limit the spread of the technology among competitors.

When an order is received from a customer, information about the necessary goods is entered into the database of the warehouse management system, after which the program finds and directs the robot closest to the location of the required product.

Using the barcodes printed on the floor, the robot finds the appropriate storage module and lifts the module to the transport position with the help of grabs. Next, the robot moves the module to the order assembly area. An employee of the company is responsible for assembling the order. In the latest Amazon fulfillment centers, it is planned to introduce automated crane systems that will allow you to distribute goods faster and save about 10 seconds for processing a single order.

The use of these robots makes it possible to increase the speed and accuracy of warehouse processes when assembling customer orders [4].

"Amazon" is also known for its ambitious projects and patents. On April 5, 2016, a patent was registered for a system of storage and delivery of goods, which uses airships and uncrewed aerial vehicles [1].

Of course, at the moment, "Amazon" is a company that is ahead of its time due to its innovative activities. First of all, the implementation of such innovative solutions requires careful planning, a large amount of financial investments and, importantly, the confidence of management in the decisions made. It is the combination of these factors that has allowed "Amazon" to become a leader in the field of e-commerce. The Amazon innovation policy discussed in this article has its advantages and disadvantages. The advantages include high efficiency and accuracy of warehouse processes, efficient use of warehouse space. Together, this leads to an improvement in the quality of the service provided to consumers and a reduction in the cost of products. However, the disadvantages include high requirements for the company's employees, insufficient motivation of the staff, and as a result staff turnover. It is also worth noting that widespread automation can lead to a significant reduction in the number of jobs provided.

Thus, the company needs to organize business processes using the joint work of people and robots, as well as increase the efficiency of personnel through motivation, rather than a system of penalties.

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