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### **Innovations in warehousing as a branch of logistics**

Logistics is a process which organizes a transfer of deliveries to the ultimate consumer. Like some business structure it has its pain points. The vast majority faced with such problems as fuel expenses, long time of delivery and low-quality service. In the following article possible ways of solving these problems will be described.

The alternative for increasing the accuracy and speed of "manual" operations is the use of data collection terminals. By scanning barcodes, a terminal sends the information about shipment to the operator's soft. In Sweden and Norway some logistics companies use a pick-up-by-voice system. This approach allows to achieve an increase in productivity and sampling accuracy, which is substantially improving the quality of the service.

For the last five years the situation in logistics had improved. Due to technical innovations, which help to speed up and streamline warehousing, automatic sort lines had appeared. Their main point is to replace human labor to improve effectiveness and satisfy consumers' needs. In comparison a human sorter is able to make 70 000 departures per day while robots do up to 200 000. According to Forbes, the new forklifts, called "vision-guided fully autonomous mobile robots," have the ability to process orders (pick and on-board for delivery) four times faster than a human. Prognosing the development in sphere of logistics, there is a real possibility of fleets and truck platooning become totally autonomous by 2030. While replacing or aiding man was a criterion for technology in material handling, for fleets, the value of autonomy centers around fuel economy. Truck platooning, for example, could save as much as 20 percent on fuel costs.

One more idea to reduce fuel expenses is to replace them with data. With big data we can notice the conversation shift from estimating the volume to the variety and value of data. This is a good way which helps to recognize a spam in the large amount of information. For example, Amazon is trying to avoid that and create predictive analytics around making orders. It has a strategy to ship products even before a potential buyer knows he wants it.

Not so far along, a mobile app, called Uber, had appeared on soft market. It also can be used in logistics purposes. It was manufactured to match truck drivers to shipper needs on rates, routes, and schedules. This is expected to automate a number of processes which refers to delivery status, dispatch, load-finding and driver payment, apart from providing critical real-time information about shipment. The result of using this app will minimize operating costs by improving asset utilization and fuel efficiency.

The blockchain technology could emerge as the new operating system for supply chain networks that combines B2B connectivity with software apps. For

instance, if you are the warehouse head responsible for flow of goods, there could be occasions where suppliers fail to deliver goods intact or on time, leading to potential time-consuming disputes and punitive legal recourse measures. Blockchain technology will avoid such situations as it would allow you to negotiate smart contracts with suppliers that clearly define terms, conditions and the mode of functioning between the two parties, while further monitoring of all goods generates critical information on the state of goods and the time of delivery.

For cutting delivery time and getting orders as soon as consumer wants it, deliveries by drones and robots had been developed. But the problem is that drones can only make deliveries of small packages and for a certain distance without charge. Despite that, there is a possibility to send out orders partially: to street addresses or zip codes in order to get the shipment as close as possible to the consumer and then in-transit complete the address and route it to someone who has placed the order.

Summing up the information above, logistics should be a complex and dynamic process. On the one hand, human labor is going to be replaced by the newest generations of robots which are easier to program, more flexible and affordable but on the other hand the quality of service will be improved, the revenue will be grown and, perhaps, more powerful inventions are going to be created.

### **References:**

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