ZOHO Creator

# Technological Innovations and The Future of Logistics

From horse-drawn carts to cargo aircraft, logistics has come a long way over the years.

With change being the only constant, the logistics industry can no longer afford to prolong the status quo. New technological advancements are poised to transform logistics, disrupting it like never before.

Here's a look at some crucial technologies that will impact the industry—an industry which has the potential to contribute **$4 trillion to the global economy.**[1]

---

1   https://innovator.news/a-4-trillion-opportunity-5e824608bb7c
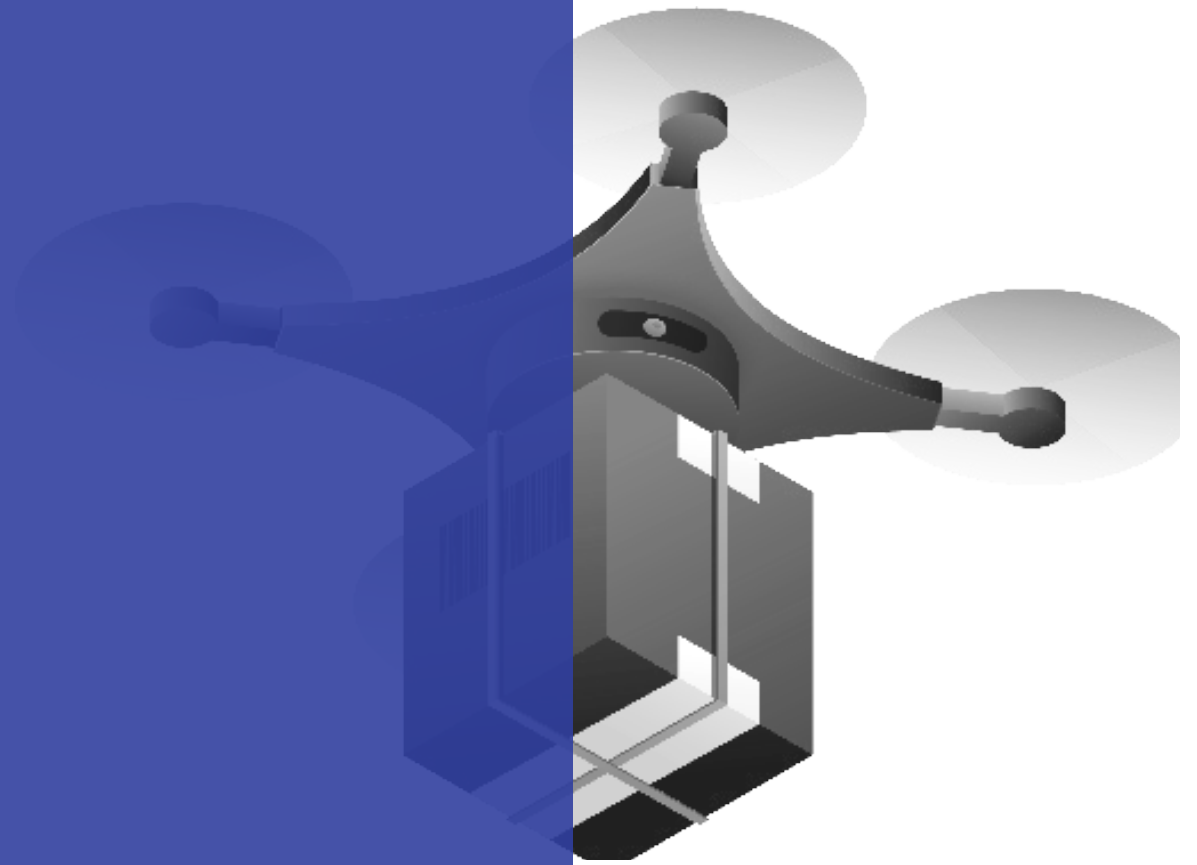
Drones

Drones, or unmanned aerial vehicles (UAVs), are flying robots that can be remotely controlled by a person or a computer.

Drones demonstrate a high potential for use in the logistics industry. The drone-based logistics market is expected to grow by an annual rate of 20%, with a valuation of **$29 billion by 2027.**[2]

Amazon is currently attempting to provide **under-30-minute deliveries using drones.**[3] It's called Prime Air and is the first major example of how drones can drastically improve customer satisfaction from a logistics perspective. Drones can allow customers to receive their orders without the need for human intervention.

In Ghana, the **largest drone delivery network on the planet**[4] has been launched, delivering critical life-saving medical supplies and serving 12 million people.

---

2   https://www.prnewswire.com/news-releases/29-06-billion-drone-logistics-and-transportation-market---global-forecast-to-2027--300667775.html

3   https://www.amazon.com/Amazon-Prime-Air/b?ie=UTF8&node=8037720011

4   https://techcrunch.com/2019/04/24/drone-delivery-startup-zipline-launches-uav-medical-program-in-ghana/

Drones can not only assist in deliveries, but they will also be used to:

- Move items in the warehouse and assist in palletization

- Keep track of item quantities using optical scanners and deep learning technologies

- Supervise the warehouse and its workers

- Prevent inventory mismatches
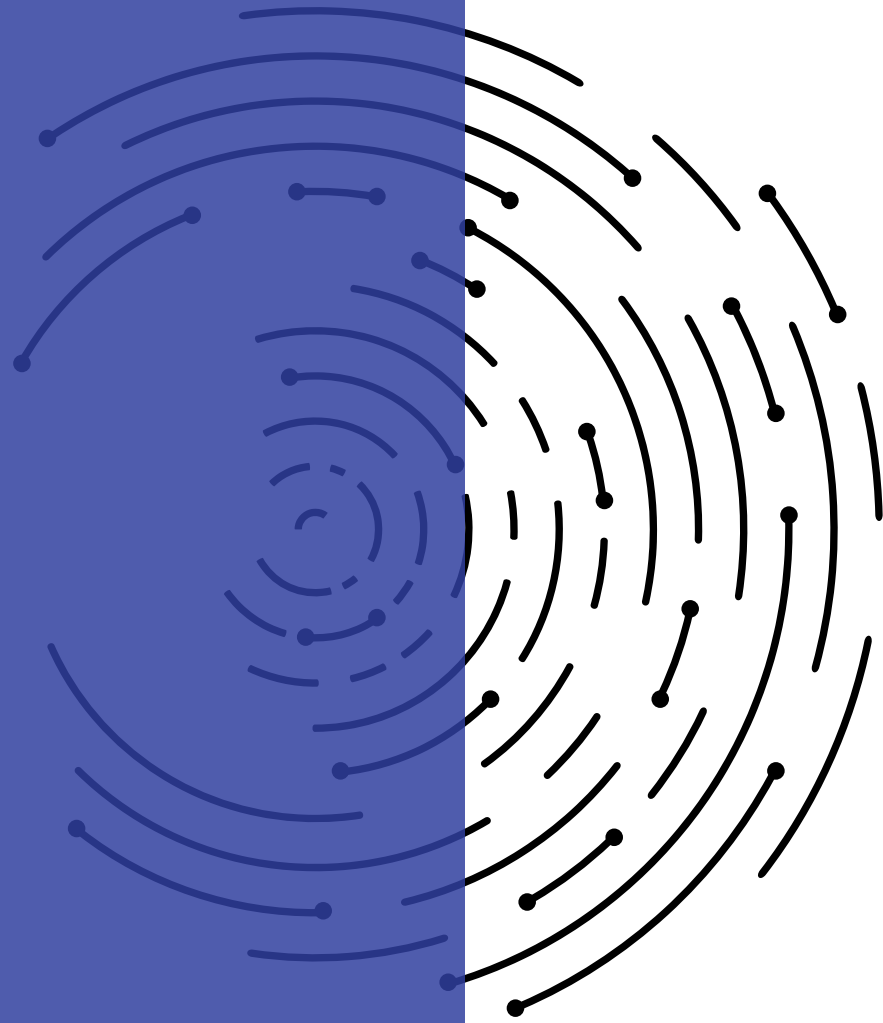
The Internet of Things

The Internet of Things (IoT) is a network of physical objects—vehicles, machines, home appliances, and more—that use sensors and APIs to connect and exchange data over the internet.

IoT heralds the next generation of the internet

Gartner predicts[5] that 5.8 billion automotive and IoT endpoints will be in use in 2020, and 20.4 billion smart devices will be connected that same year.

And because the possibilities of IoT are many, it opens up myriad opportunities for logistics:

Logistics routing

According to Forbes,[6] Union Pacific, the largest railroad in the United States, uses IoT in its operations. This IoT system uses a network of acoustic and visual sensors on railroad tracks. Data generated by this matrix of sensors is then used to predict equipment failures, and preemptively avoid derailments.

---

5   https://www.gartner.com/en/newsroom/press-releases/2019-08-29-gartner-says-5-8-billion-enterprise-and-automotive-io

6   https://www.forbes.com/sites/insights-inteliot/2018/06/14/logistics-4-0-how-iot-is-transforming-the-supply-chain/#638801b2880f

In logistics routing, IoT provide:

- Real-time tracking of the fleet by integration with telematics devices
- Enhanced safety
- Live traffic projection

Improved inventory management

Inventory management is a crucial factor in logistics, and a herculean task to manage optimally. IoT, however, will make **it a walk in the park.**[7] RFID tags can be attached to items, ensuring a constant feedback loop on the vital statistics of each one. Managers will be able to access data about stock status, expiration dates, item location, demand forecasts, and more.

Streamlined warehouse operations

IoT sensors can provide data about the ambient conditions of warehouses, which will be of great use in the storage of perishable stock. The temperature can be set up to dynamically adjust itself, to extend the shelf life of these types of commodities.

And IoT sensors can also be used to monitor energy consumption, leading to more economical power usage.

---

7   https://clearspider.net/blog/internet-of-things-inventory-management/

Enhanced productivity and efficiency

IoT provides logistics organizations with enhanced productivity and efficiency, made possible by its ability to facilitate seamless multiplatform collaboration. IoT-enabled software provides real-time access to the fleet and its workforce. This enables leaders to make quick decisions and reduce operational overhead.

Artificial Intelligence

Artificial intelligence (AI) is the simulation of human intelligence processes, such as visual perception, speech recognition, and decision-making by machines, especially computer systems.

Recent **research**[8] predicts that the implementation of artificial intelligence in the supply chain will allow companies to save between $1.3 trillion and $2 trillion per year worldwide.

Let's take a look at how AI can impact logistics:

Autonomous vehicles

Forklifts were the first vehicles to manage this feat. Powered by AI, they become machine-vision guided, completely autonomous mobile robots, gaining the ability to process orders four times faster than humans. Warehouses especially benefit from autonomous forklifts, as human movement is among the most unproductive and time-consuming tasks in these situations.

Trucks, vans, and buses can also be fully autonomous, or have partial autonomy with a human driver present. Driverless vehicles will reduce accidents caused by human error and lower the burden of physical labor, and in turn reduce expenses for logistics organizations.

---

8 https://www.economist.com/special-report/2018/03/28/how-ai-is-spreading-throughout-the-supply-chain?FEATURE_ARTICLES_V1=0

Waymo, a pioneer in the autonomous vehicle domain, is trying to build driverless trucks. It also seeks to make trucking safer, and **their revenue is predicted to hit \$114 billion by 2030.**[9]

Warehouse automation

AI-powered robots can assist in warehouse automation tasks such as:

- Automatically sorting items - Items can be automatically sorted using parameters such as weight and dimensions.

- Assessing the condition of items - Using optical image recognition algorithms, the condition of items like groceries can be assessed.

Ocado is an **automated warehouse pioneer.**[10] Ocado's robots can process 3.5 million items—lifting, moving, and sorting them for approximately 65,000 orders every week. This AI-powered automation greatly reduces the human effort involved in managing the warehouse's inventory.

---

9   https://www.cnbc.com/2018/12/06/ubs-analyst-estimate-on-alphabet-self-driving-car-waymo-revenue.html

10   https://www.theverge.com/2018/5/8/17331250/automated-warehouses-jobs-ocado-andover-amazon

Streamlined operations

Logistics office operations are repetitive, so AI really comes to the rescue here by offering several optimizations:

- Chatbots are AI-powered software solutions that can automatically respond to customer queries. They eliminate the need to hire expensive customer support associates.

- Business process automation software automates repetitive tasks and workflows, which allows stakeholders to devote attention to what's important. Also, this automation provides a higher return on investment and cost savings.

Improved customer experience

Amazon's AI-powered assistant is tied up with **DHL's parcel service.**[11] Using voice commands, users can track the status of their packages by asking simple questions like, "Hey Alexa, where's my package?" In response, Alexa will provide the shipment's details. At its core, artificial intelligence-powered technologies like this will enhance the customer experience.

---

11   https://postandparcel.info/79952/news/parcel/dhl-parcel-offers-alexa-interaction/
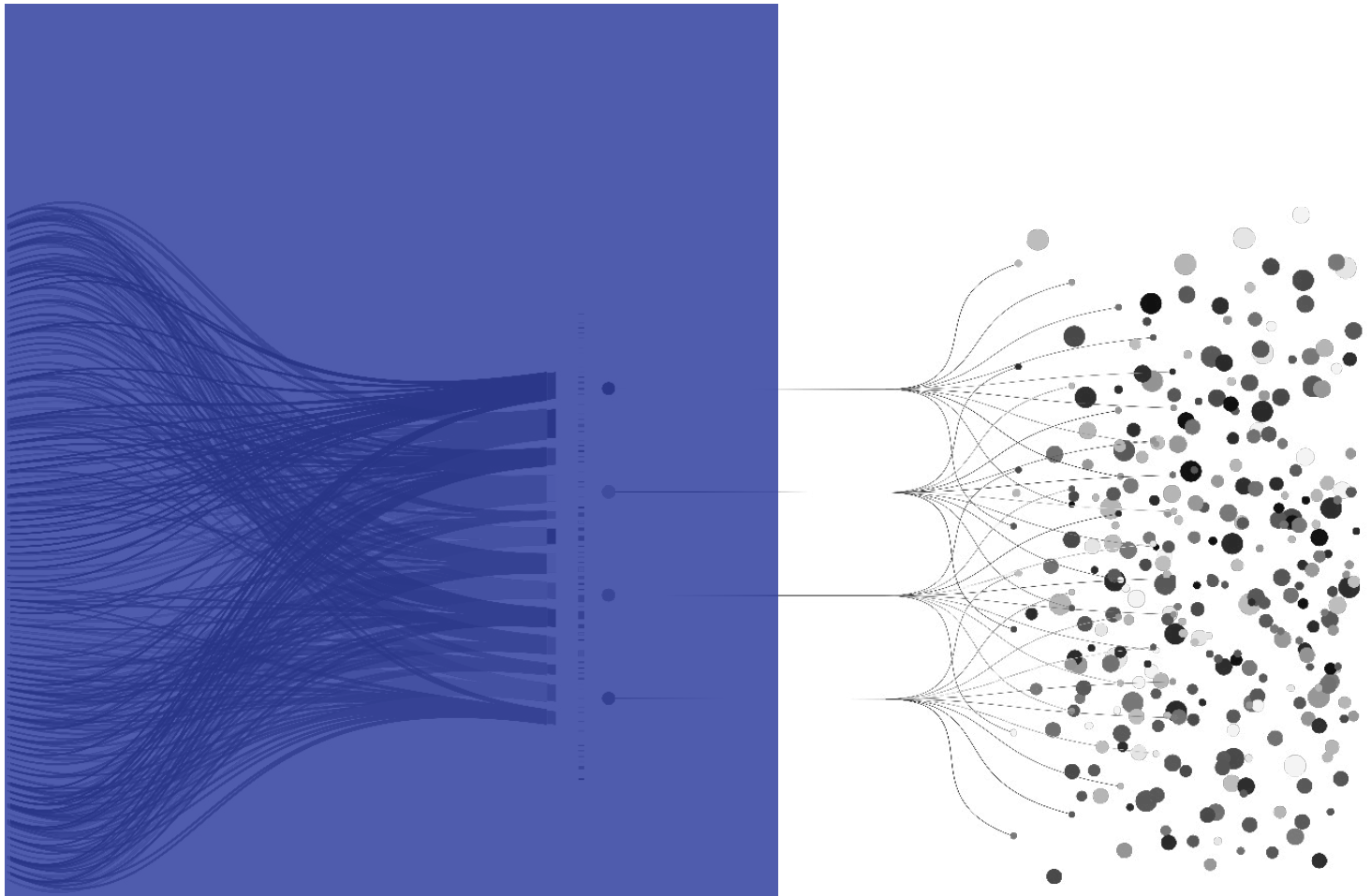
Big Data Analytics

Big data[12] refers to huge data sets that can be computationally analyzed to unearth patterns and trends. The use of software in the logistics industry generates lots of data, which can be analyzed by data scientists to gain insight into improving efficiency.

In this **3PL study,**[13] 98% of 3PL providers said that data-driven decision-making is "essential to the future success of supply chain activities and processes."

Data can be gathered for analysis from these sources, among many others:

- Data from telematics devices which provide details on vehicles, routes, and location

- Financial data from audits and forecasts

- Traffic and weather data from sensors and satellites

Some of the advantages reaped from big data for logistics are:

---

12   https://www.oracle.com/big-data/guide/what-is-big-data.html

13   http://www.3plstudy.com/

Optimized routing

In logistics, optimal routing is of the utmost importance. With ever-changing factors, such as the weather and traffic, a delayed fleet equals reduced profits. Data gathered from weather sensors, GPS, mobile devices, and telematics devices can be analyzed using predictive modeling to figure out the optimal route for delivery, all in real time. This will reduce delays in shipments and increase fleet efficiency.

Crowdsourced last-mile delivery

Last-mile delivery can incur substantial overhead if not executed properly. Using data gathered from applications running on commuters' mobile devices, deliveries that are heading in the same direction can be identified. At that point, commuters can be paid to make these deliveries. This eliminates the need for logistics players to take care of the last-mile delivery in-house, reducing costs, and simultaneously helping to reduce traffic.

Market intelligence for businesses

Data scientists can analyze swathes of legacy shipment data, use regression analysis, and generate insightful reports which can assist them in improving the precision of demand and supply forecasts. This intelligence is of great use to small and medium-sized businesses seeking to maximize their operational revenues.
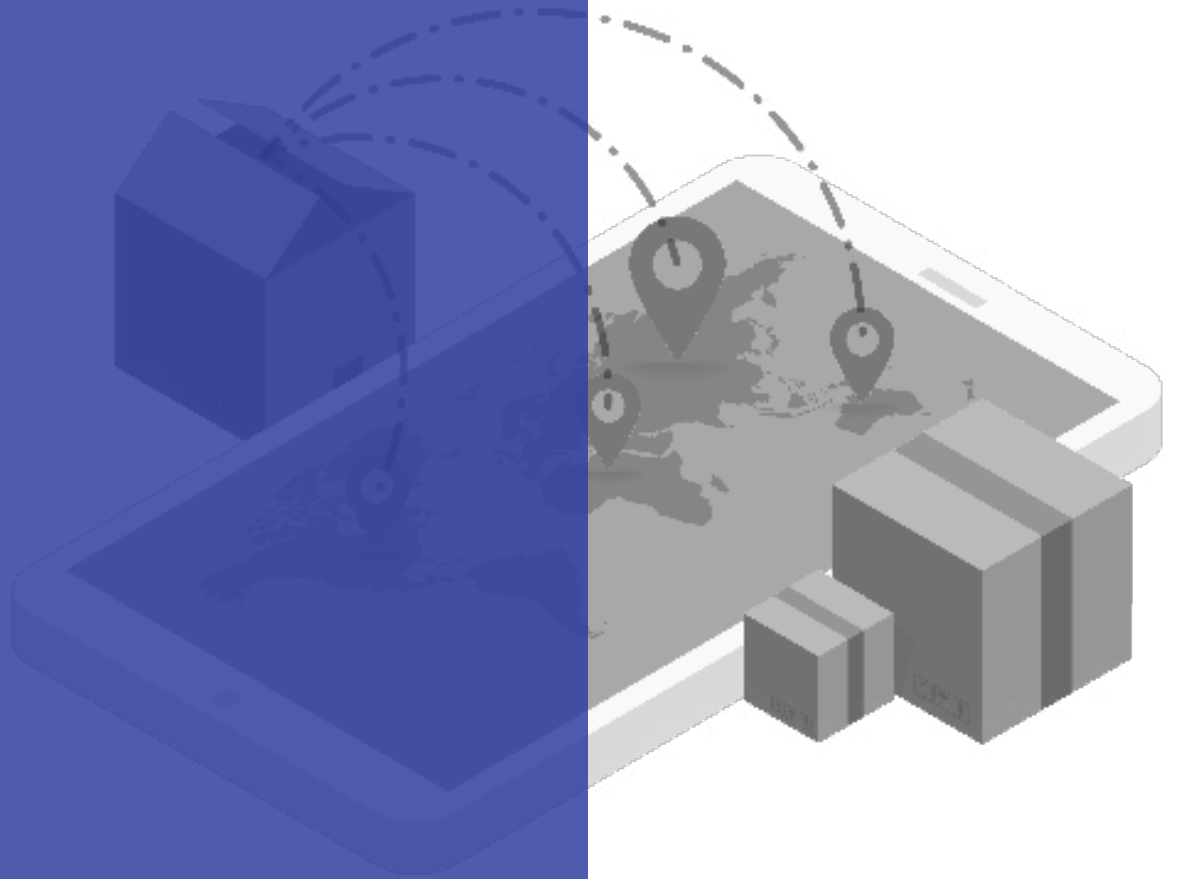
Logistics Applications of the Future

Considering the impending upheaval in the logistics industry, organizations should adopt a digital transformation strategy in order to stay ahead of the pack. This strategy should also determine the most suitable software on which the business runs.

When it comes to logistics software, ERPs are expensive and clunky, and generic logistics software won't address all of your needs. **What you need is custom software to run your logistics business.**[14] Custom software development platforms like **Zoho Creator**[15] enable you to develop software all by yourself, with no prior computer programming knowledge required. The logistics applications of the future are custom applications.

Zoho Creator is future-ready and can be used to harness any technological advancement the logistics industry may see.

14   https://www.zoho.com/creator/help/ebooks/custom-software-for-logistics-industry.html

15   https://www.zoho.com/creator/

Looking Ahead

What we've seen is just a glimpse of what the future has in store for logistics.

These technological innovations mean:

- Efficient operations
- Increased profits
- Radical growth
- Improved customer satisfaction

Technological advancements will take center stage in this new era of logistics, shaping its future. Embracing these advancements will provide tremendous benefits—it's the solution to satisfying today's ever-increasing customer expectations.

ZOHO Creator

www.zoho.com/creator

We'd love to talk! Reach out to us:

sales@zohocreator.com