Qulix
SYSTEMS

LOGISTICS 4.0:
THE MOST IMPORTANT TECHNOLOGICAL TRENDS

Introduction

Logistics is undergoing an important transformation. The industry faces serious challenges: growing complexity of operational processes as well as a need for greater variety, shorter product life cycles, etc.

In 2016 DHL identified technological trends that are going to influence the logistics industry within the next five years. Each of the trends is considered by experts as highly, medium or less important.

According to the DHL experts, the most important trends that will be responsible for revolutionary changes in logistics are 3D Printing, Big Data, Cloud Computing, IoT, Robotics & Automation as well as Self-Driving Vehicles.

3D Printing

3D printing technology is expected to have a great impact on logistics. The experts predict, that the physical connection between manufacturer and customer might be resolved by a digital sending of manufacturing data via the Internet.

Logistics services will become more personalized. The blurring of digital and physical goods will lead to a partial replacement of distributors by internet-based smart services.

> *"3D printing (or additive manufacturing) will disrupt logistics by adding new diversity to manufacturing strategies. Some companies may stop traditional fabrication, but most will combine 3D printing with mass production techniques. Leveraging this shift, innovative logistics providers can orchestrate complex hybrid manufacturing networks, as well as utilize networks of 3D printers to offer new logistics services."*

Predictions and expectations:

- Growing complexity of regional logistics networks due to a combination of traditional and 3D printing manufacturing strategies.
- New B2B 3D-printing services will replace big warehouses by organizing 3D infrastructure.
- Hyper-personalization due to the on-demand production of individualized goods in local distribution centers equipped with 3D printers.

Big Data

Big Data offers a solid potential for the logistics area.

The analytical data evaluation will provide logistics companies with the possibility to visualize particular logistic processes within the supply chain in order to significantly speed up the decision making.

> " [...] logistics providers will need to master the integration of structured and unstructured data (social, images, video, etc.) from multiple data streams to harness the full potential of big data. This coupled with the advancement of analytics technologies will further unlock exciting new ways to monetize data-driven operating and business models."

Predictions and expectations:

▌ Better operational efficiency through optimization of resources usage, quality, performance and transparency of decision making.

▌ Improved customer experience due to customer segmentation and targeted services.

▌ End-to-end supply chain risk management using predictive analytics to detect risks.

▌ New business models due to data-based intelligence services.

Cloud logistics

In recent years, companies have already started to use cloud computing for their complex environment as it provides an easier and efficient access to IT services. In fact, cloud computing doesn't require a cost-expensive traditional IT infrastructure.

> " In future, the key focus will be on 'cloud readiness', especially in terms of security as well as the technological performance of cloud in real-time, large-scale operations."

Predictions and expectations:

▌ Modular cloud logistics platforms will provide open web-based access to relevant IT services that can be flexibly configured and integrated into supply chain system.

▌ Cloud-powered global supply chains will unify all data and information in a single system enabling easy management and real-time access.

Internet of things

IoT offers a wide range of advantages for logistics providers as well as their business and end customers throughout the value chain.

Real-time vehicle tracking, business processes automation, data analysis etc. are just a few examples of IoT features.

> *"IoT promises far-reaching payoffs for logistics providers that can use the data from the connected objects to generate actionable insights that drive change and new solutions."*

Predictions and expectations:

▌ Connected warehouses: tagging of items and warehouse equipment for automated real-time inventory management.

▌ Intelligent transportation solutions in form of innovative smart truck concepts (in-vehicle telematics).

▌ The connected consumer: the further spreading of smart home devices will enable new IoT-based delivery services, e.g. automatic food order by smart fridges.

Robotics & automation

Robots are expected to revolutionize the logistics industry. Industrial robots have already undertaken some tasks in manufacturing. However, they are not intelligent enough to help humans in distribution centers and warehouses. Current technological advances in robotics and automation will change this.

> *"Robots in particular will adopt collaborative roles in the supply chain, assisting workers with warehouse, transportation, and even last-mile delivery activities."*

Predictions and expectations:

▌ Flexible automation in warehousing and fulfillment by usage of robots for picking, packing and sorting of goods.

▌ Trailer and container unloading robots to reduce employees' physical workload.

▌ Assistance robots for local delivery to help personnel to carry heavy items or deliver letters to a relevant collection point.

Self-driving vehicles

Autonomous vehicles are already well-known in logistics but only working under strict human control in warehouses.

However, the new generation of autonomous vehicles will enable their deployment in public spaces.

According to DHL, self-driving vehicles can offer great advantages, e.g. increased safety on roads, reduced fuel consumption and minimized CO2 emissions.

> *"From autonomous forklifts in warehouses to driverless trucks in line-haul transportation, self-driving vehicles will transform logistics by unlocking new levels of safety, efficiency, and quality."*

Predictions and expectations:

▌ Warehouses of the future will be equipped with autonomous forklifts,

pallet movers, etc. for a new level of machine-human cooperation.

▌ Outdoor logistics operations: automated container handling and loading.

▌ Line-haul transportation using driverless vehicles to increase safety and avoid human mistakes in case of long driving routes overnight and under bad weather conditions.

▌ Autonomous last-mile solutions in form of parcel vehicles to deliver individual orders.

Conclusion

New technological trends and technologies are very promising for logistics providers: productivity increase, service improvement, costs reduction and better work conditions for employees.

The DHL researchers believe that very soon Big Data applications will make significant changes in global and local transport chain management and organization.

Cloud Logistics, IoT and Robots are also expected to become a big trend in the coming five years.

3D printing and predictive analytics will enable accurate forecasts, e.g. shipping of goods to a nearby distribution center after analyzing customer behavior to reduce delivery time.

Augmented Reality, Bionic Enhancement, Low-cost Sensor Technology, Self-learning Systems, Unmanned Aerial Vehicles will also become a trend in logistics, but currently they are rated by experts as medium important.

About Qulix

Qulix Systems is a global provider of software design and development, quality assurance and IT consulting services. Since the year of 2000, we aim at delivering high-quality software solutions meeting our clients' needs across multiple business domains.

Internet of Things, Telematics and Artificial Intelligence belong to our core software development competencies.

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