

Digital Transformation of Supply Chains

Industries across sectors and across borders are undergoing a new wave of digital transformation. This transformation is high on the political agenda in the European Union¹, with some member states such as Germany², Spain³ and the Netherlands⁴ leading Industry 4.0 and similar initiatives. Industry 4.0 is considered the next step in manufacturing, the fourth industrial revolution connecting interoperable devices to create supply chains that operate independently.⁵

The logistics sector is part of the on-going digital transformation where **new and disruptive business models** will change the way in which the sector operates. As such, **big data**⁶ and **Internet of Things (IoT)** are two concrete examples that will vastly improve supply chain efficiency. The total value of IoT is estimated at \$ 8.0 T and the supply chain/logistics will contribute 1.9 T to it⁷.

Big data can enhance operational efficiency, for instance through internal and Business to Business (B2B) social networks that link colleagues and business units, Business Analytics Platforms as a service, Network Redesign Software and improved product lifecycle management. Business networks bring together different elements of the supply chain and improve purchasing processes. Through cloud connections, these networks connect different partners, enabling cost savings for companies big and small. They allow for logistics providers to be connected with their customers, and some networks can even support with procedures required by the different customs authorities globally.

The **Internet of Things** has the potential to transform the traditional value chain from manufacturing to delivery. It begins from digitalised manufacturing process, integrated warehousing operations, real time and improved traffic and fleet management to



consumer connections through smart phones, and improved last mile delivery options. Moreover, more effective inventory management through connected items and pallets will become widespread, while maintenance checks on transport fleets can be scheduled automatically, and failures can be predicted.

Source: DHL Trend Report – Internet of Things

¹ https://ec.europa.eu/commission/2014-2019/bienkowska/announcements/reindustrialisation-europe-industry-40-innovation-growth-and-jobs-forum-europe-conference_en

² <http://www.bmwi.de/DE/Themen/Industrie/industrie-4-0.html>

³ <http://www.industriaconectada40.gob.es/Paginas/Index.aspx>

⁴ <http://www.smartindustry.nl/eng/>

⁵ <http://scn.sap.com/community/manufacturing/blog/2015/06/30/industry-40--fourth-industrial-revolution>

⁶ http://www.dhl.com/content/dam/downloads/g0/about_us/innovation/CSI_Study_BIG_DATA.pdf

⁷ http://www.dhl.com/content/dam/Local/Images/g0/New_aboutus/innovation/DHLTrendReport_Internet_of_things.pdf

In addition to these developments, **collaborative robots** and improvements in **robotics** will drive innovation in the sector. Self-driving trucks and drones may soon be available to deliver packages and goods. In manufacturing, 3D printing has the potential to encourage decentralised manufacturing and regionalise distribution. The global market for 3D printers and services is predicted to grow exponentially in the coming years from \$2.5 billion in 2013 to \$16.2 billion in 2018⁸.

In order to allow for the digital transformation of supply chains to happen, industry and policy makers should cooperate to address the following points:

- **Use of data:** several data related issues need to be addressed to complete the digital transformation. Firstly, there needs to be transparency of data. Secondly, data privacy has to be ensured. Thirdly, data literacy and skills need to be improved in order to ensure that the necessary human resources are available.
- **Interoperability:** the interoperability concept needs to extend to environments that are dissimilar, and to devices vastly different in size, purpose and capabilities. All stakeholders must therefore work together to ensure that different devices can operate together.
- **Unique identifiers:** a clear and standardised approach to unique identifiers across industries and borders is necessary.
- **IoT reference architecture:** there should be a clear focus on the reference architecture for the Internet of Things in order to achieve the above.
- **Increased B2B networks focus:** there is currently not enough focus on B2B networks, and how business models have changed through social, mobile and big data. While certain aspects of B2B and Business to Consumer (B2C) networks may be converging, therefore, consumer and B2B aspects need to be equally addressed in the debate.
- **Regulatory adaptation to new business trends:** The logistics industry is adapting to multi-channel shopping and crowd-sourced/on demand logistics, so should the regulatory frameworks in which they operate.
- **Independent cloud services as a utility:** In order to ensure that no single business or user can take ownership of data networked in the cloud sphere, providing for an independent cloud operator would be essential.
- **Human resources:** The digital transformation does not only require tools and technology, it also requires t people with the right skill sets to navigate through the digital transformation.

⁸ <http://www.pwc.com/us/en/technology-forecast/2014/3d-printing/features/future-3d-printing.html>