Replacing Human Intelligence with Artificial Intelligence:

Is this a Viable Solution to Overcome the Logistics Skill Shortage?

– Julia May & Jonathan Dörr 25.10.2020

While some people seem to see a shortage of skilled workers, others anxiously ask when and to what extent robots, autonomous driving, and artificial intelligence will replace humans in logistics, thus eliminating millions of jobs. Too much remains unknown about the supply and demand of human labour in the age of digitalization and data economy. Accordingly, much uncertainty arises with the replacement of human intelligence with artificial intelligence such as machines or autonomous driving and resorting to cheaper and more effective algorithms.[1]

Considering the facts, skill shortage plays an increasing role in logistics companies. According to the UK Logistics Monitor and a World Bank study (2017) the logistics skill shortage is getting worse: 54 Percent of logistics companies in the UK expect that the skill shortage will increase in the next 5 years[2] and Europe and North America also expect the driver shortage to escalate over the next 5 to 10 years.[3]

While there is a high demand for low-skilled workers like office staff, warehouse workers and vehicle drivers, the STEM fields (higher skilled jobs) such as software engineers, project managers, and executives are the hardest roles to fill.[4]

Especially the shortage of skilled truck drivers is a problem in the more developed regions. With an estimated shortage of 150.000 truck drivers in Germany and about 45.000 truck drivers in the United Kingdom, these two countries have the most serious skill shortage problems among the European Union States. But the skill shortage is not only a problem of the more developed countries; in emerging markets like India, Brazil, or South Africa lack of skilled labour is common as-well.[5]

The shortage of skilled workers has a lot to do with the demand for labour - the behaviour of companies - and comparatively little with the supply of labour - people who want to work.[6] With a high physical workload and at the same time a low wage compared to other branches, the logistics industry is not as attractive for young applicants as other sectors.[7]

From a company perspective, the most common challenges facing successful recruitment pertain to the following: a lack of job specific skills, a lack of work experience, and the low wages in the logistics branch.[8]

Evidently, skill shortage is an important issue and hence, we need to understand how automation would impact the current skill shortage.

The following figure gives an overview of the degrees of automation in the different parts of a logistics supply chain. The different hues of blue in the value chain represent the possibility to replace human labour by robot, where a darker shade reflects a high likelihood of substitution.

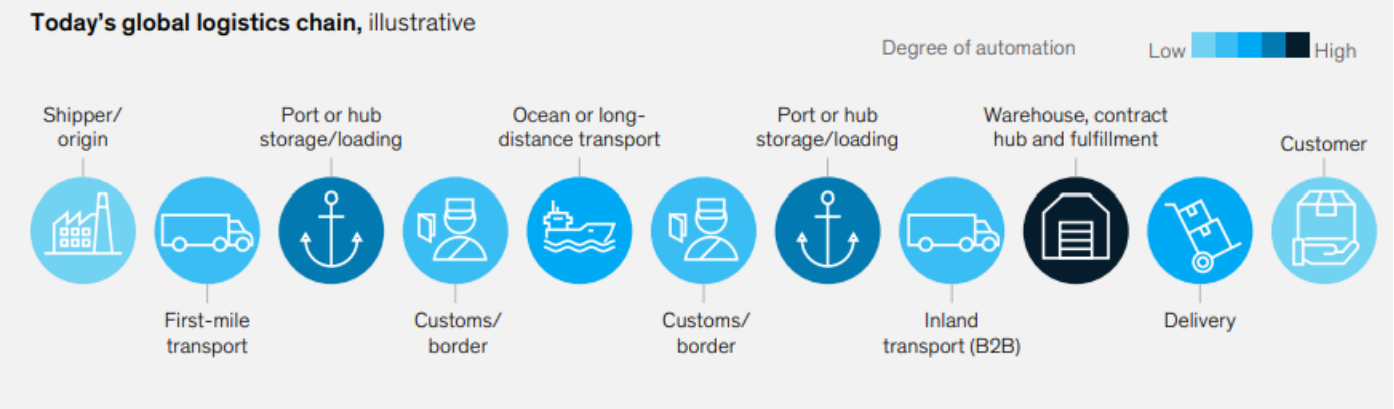

Figure 1: Automation in logistics

Based on the figure one can conclude that the processes in the warehouse have the greatest potential to be automated. The number of human workplaces in these areas can be easily replaced with artificial intelligence. With these advancements in mind, low-skilled workers are no longer in high demand and can be reduced.

In road freight transport, autonomous driving would allow the amount of needed truck drivers to decrease dramatically as technology would take over the functioning of the vehicle. However, for legal and technical reasons, artificial intelligence has not advanced to that degree of reliability; the driving of vehicles without human control is not yet possible.[9]

It is important to note that automated processes cannot be carried out without a human assistance. This human assistance is required for development and maintenance of the automated processes.

Ultimately, shifting human to artificial intelligence could drastically impact the job market. Companies will seek employment of high skilled labour rather than low skill; this could lead to a change in the logistics skill shortage.

There must be a supply of qualified workers in the STEM fields to fill the skilled labour positions needed for the implementation of artificial intelligence.

So, the question remains, can artificial intelligence cope with the shortage of skilled workers or not?

To sum up, we think replacing human intelligence with artificial intelligence can help to reduce the logistics skill shortage, especially for lower skilled workers. Due to autonomous driving trucks, this would have a positive impact on the shortage of truck drivers in more developed countries like North America and Europe. As a result of automation, the demand for higher skilled workers, who can manage and monitor automated processes, will increase. Nowadays these high-skilled roles are difficult to find. With advanced automation, these roles will even be harder to find in the future. Given the skilled labour shortage, the success of artificial intelligence is not guaranteed, therefore other solutions must be found.

In our opinion the logistics companies have to take actions to make the workplaces more attractive. For example: better working conditions and flexible working time models also for parents and single mothers, duty free employee discounts, promoting and training

for employees and creating career opportunities.

In the end it only remains to say that there needs to be more solutions than just artificial intelligence to prevent future logistics companies from an ongoing skill shortage.

Sources:

1 Prof. T. Straubhaar (2019): Fachkräftemangel in der Logistik – tatsächlich?, DVZ, URL: https://www.dvz.de/rubriken/meinung/detail/news/fachkraeftemangel-in-der-logistik-tatsaechlich.html, Date accessed: 16.10.2020

2 The Chartered Institute of Logistics and Transport (2019): Logistics sector facing severe skills shortage in next five years, URL: https://ciltuk.org.uk/News/Latest-News/ArtMID/6887/ArticleID/22813/Logistics-sector-facing-severe-skills-shortage-in-next-five-years-CILT-finds, Date accessed: 16.10.2020

3 Alan McKinnon, Christoph Flöthmann, Kai Hoberg, and Christina Busch (2017): Logistics Competencies, Skills, and Training a Global Overview, World Bank Study, P.26

4 The Chartered Institute of Logistics and Transport (2019): Logistics sector facing severe skills shortage in next five years, URL: https://ciltuk.org.uk/News/Latest-News/ArtMID/6887/ArticleID/22813/Logistics-sector-facing-severe-skills-shortage-in-next-five-years-CILT-finds, Date accessed: 16.10.2020

5 Alan McKinnon, Christoph Flöthmann, Kai Hoberg, and Christina Busch (2017): Logistics Competencies, Skills, and Training a Global Overview, World Bank Study, P.25/26

6 Prof. T. Straubhaar (2019): Fachkräftemangel in der Logistik – tatsächlich?, DVZ, URL: https://www.dvz.de/rubriken/meinung/detail/news/fachkraeftemangel-in-der-logistik-tatsaechlich.html, Date accessed: 16.10.2020

7 R. Liebig (2020): Fachkräftemangel in der Logistikbranche 2020, Logistic News 24, URL: https://www.logistik-news24.de/fachkraeftemangel-logistikbranche/, Date accessed: 16.10.2020

8 The Chartered Institute of Logistics and Transport (2019): Logistics sector facing severe skills shortage in next five years, URL: https://ciltuk.org.uk/News/Latest-News/ArtMID/6887/ArticleID/22813/Logistics-sector-facing-severe-skills-shortage-in-next-five-years-CILT-finds, Date accessed: 16.10.2020

9 S. Grundhoff (2020): Autonomes Fahren kommt 2020 nicht voran: Zähes Geschäft, Automobil Produktion, URL: https://www.automobil-produktion.de/technik-produktion/forschung-entwicklung/autonomes-fahren-kommt-2020-nicht-voran-zaehes-geschaeft-370.html, Date accessed: 20.10.2020

Figures:

Figure 1: Ashutosh Dekhne, Greg Hastings, John Murnane, and Florian Neuhaus (2019): Automation in logistics: Big opportunity, bigger uncertainty, MC Kinsey, P.3

“We hereby allow Carola Schulz to publish this article on her HHN webpage”