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## The impact of digital technology on skills in logistics warehouses



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Driven by both technological developments and the boom in e-commerce, the logistics sector is currently undergoing far-reaching changes in its production processes. These dynamics could well lead to radical changes in working and employment conditions in a sector in which the demand for manual labour is very high. This edition of Training & Employment addresses the various challenges – including digitalisation, the sector's attractiveness to workers and skill and career management – that French warehouses and logistics platforms are currently having to face.



E-COMMERCE

FORWARD-LOOKING  
OF JOB MANAGEMENT

MANPOWER  
MANAGEMENT

MANPOWER NEED

LOGISTICS

TREND IN  
QUALIFICATIONS

TECHNOLOGICAL  
CHANGE

At the interface between manufacturing industry and services, the transport and logistics sector is often cited by government bodies as one of the drivers of change in industrial policy and energy transition. Logistics in particular relies on a largely manual workforce, and now has to deal with the development of *ad hoc* digital tools in warehouses: bionic exoskeletons, pallet stacker cranes, voice commands, inventory drones, inventory management software, "smart" shelving that can send articles to handlers, etc. More generally, the sector is having to contend with the development of e-commerce, which is being driven by new international actors and presages the reorganisation of its value chains. Although these reconfigurations of production processes can lead to profound changes in work, employment and training in the medium term, as is already being seen in transport, the current problems in workforce management in warehouses and logistics platforms (WLPs\*) currently have little to do with this radical transformation of the sector.

### Automation still far from commonplace and a digital transformation driven by e-commerce

Logistics is characterised by low profit margins and competition on costs, resulting in a cautious attitude towards the adoption of technologies. Logistics companies are reliant on their customers' and suppliers' needs and face fierce competition. They also have to deal with serious constraints in terms of deadlines, flexibility, diversity of merchandise

and the frequently cyclical nature of business. The capitalist structure of warehouses and logistics platforms in France highlights the significant influence of ten big groups that specialise not only in retail but in also transport and storage, two areas in which more than 50% of WLPs are to be found. With more than 30 WLPs each and accounting for 12% of all facilities, these large groups are one of the main drivers of technological change in the sector. In contrast, the vast majority of WLPs - almost nine in ten - belong to small groups that operate one or two of them [5].

Although the digitisation of logistics activities tends to be associated with the automation of operations, this remains the exception. In 2016, only 5% of Warehouses and Logistics Platforms carried out at least one logistics operation using a fully automated system. In contrast, in more than a third (37%) of WLPs, logistics operations are mechanised but remain under the control of an operator. The most common scenario, however, remains warehouses that still rely exclusively on manual labour assisted by simple logistics tools (61%) [5].

So what are the major motives for and obstacles to introducing new technologies in warehouses? If we look further than the very real problem of the cost of the equipment for SMEs, it is likely that technological changes will bring about a reduction in labour costs through the automation of production processes. Although this aspect is by no means insignificant, there are also other factors that can influence companies' decisions on whether or not

## 1 From logistics to e-logistics in the United States

The numerous prospective studies and discussions on the opening of ever-bigger, vertical, and sometimes completely automated warehouses raises the question of the future of unskilled or low-skilled employment in a sector that still employs many manual workers. However, this analytical framework tends to mask a very nuanced reality when it comes the forms taken by the transformations brought about by this recent digital shift. Widely impacted since the 1970s by the rise of large-scale retailing, logistics is now being disrupted by the big domestic and global e-commerce players. With the arrival of these players, logistics has gone from large-scale retailing in superstores, where people go to do their shopping by car, to online orders placed through a computer, tablet or smartphone and then delivered to the home or a nearby shop, in most cases free of charge and on the next day. The principles behind the success of e-commerce have both widened the scope of logistics (last mile logistics and delivery, returns logistics), and, at the same time, reorganised its working patterns (faster pace and greater uncertainties) and methods (smaller quantities of goods), resulting in the reorganisation of supply chains, from its working patterns to the actors involved via the employment and working conditions of the sector's workforce. In fact, like immediate delivery platforms, companies are competing with one another to reduce delivery times and costs. This approach involves seeking to reduce costs right across the supply chain, between the optimisation and outsourcing of production, transit and delivery costs. So, although it is unlikely that the sector will see a dramatic fall in the number of jobs in warehouses over the next decade, various studies conducted in the United States on the hegemonic development of Amazon [1; 3] indicate that large numbers of workers will see a change in their work content and job quality. As in France, e-commerce represented around 9% of retail sales in 2019, having seen a similar increase (a doubling of its market share in 7 years). The implications of the development of e-commerce for day-to-day work include the potential emergence of new forms of work intensification and the deskilling of many jobs, in turn encouraging the increased use of temporary staff. Furthermore, the reconfiguration of the production system as a result of the ongoing e-logistics revolution is likely to bring with it more extensive changes in the industrial fabric and in industrial relations (growth of subcontracting and self-employment, fewer unionised workplaces, racialisation of the workforce) right across the transport and logistics sector.

to apply new technologies in warehouses. A tight labour market, rising land prices or increases in merchandise turnover are among the main factors that encourage logistics companies to explore new technologies. Conversely, the unpredictable nature of the business, the dynamics of delocalisation or even inertia and the degree of advancement of the technological innovations themselves are all factors that deter companies from investing in such equipment [3]. E-commerce - which accounted for 9.1% of retail sales in 2018, up from 5% in 2011 - and retail sales more generally (accounting for 48% of the total surface area of WLPs [6], were the main areas in which new technologies were trialled. These areas are characterised by the existence of several large WLPs, where storage time is shorter and workforces are larger. Small packages (individual orders) combined with more frequent orders are motivating factors and are better suited to process automation, which is being driven by the rapid growth and establishment of new global e-commerce businesses such as the American Amazon group and the Chinese group Alibaba.

So, rather than digitisation *per se*, the logistics sector appears to be experiencing a technological surge driven by the development of digital distribution channels [9]. In this context, and

faced with a sectoral landscape dominated by the big distributors and big transport and storage companies, the recent arrival of new global and domestic e-commerce businesses is playing a key role in the reconfiguration of value chains in the sector: processes, equipment, boom in last mile/urban logistics and returns logistics (see Box 1).

### A manual labour industry now short of job applicants

Having been a job creator for the last five years, the Transport and Logistics sector now faces a shortage of trained applicants in some areas. Logistics, in particular, which employs more than 800,000 people, 700,000 of whom are manual workers (that is 13% of all French manual workers) [2], is not immune to these problems. The recruitment problems in WLPs, that both employers and temp agencies have complained about, are due primarily to the lack of attractiveness of jobs when warehouses are located in dynamic employment zones and the issue of career stability in a sector where employment insecurity is high. The employers questioned mentioned the difficulty they had in recruiting and retaining their workforce in "unskilled and less attractive jobs" due to the sector's poor image, the significant entry cost for manual workers, and the difficult work and employment conditions: the need to hold licences for different types of vehicles, workplaces located away from residential areas and with poor or non-existent public transport, low wage levels and an above-average frequency and severity of accidents.

Logistics is characterised by high labour needs, mainly for unskilled or low-skilled manual jobs. 80% of warehouse employees are men, working mostly in manual jobs, and with a relatively low level of education: three quarters of manual workers have a CAP qualification. The age distribution also indicates that employees in transport and logistics are getting older: although half of them were under the age of 40 in 2006, this had fallen to 44% ten years later (18% under the age of 30) [7]. The Association pour le développement de la formation professionnelle transport et logistique (Association for the development of vocational training in transport and logistics - AFT) puts this ageing down to a "loss of job applicants" and to the existence of retraining jobs such as driving heavy goods vehicles. Finally, logistics is a manual labour industry where workers face significant job insecurity. Workforce management is as lean as possible, with extensive but uneven recourse to temporary staff: 14% on average, with marked differences between directly operated warehouses and those which are operated on behalf of others, large domestic and international groups, and independent businesses. In 2018, a quarter of people working in a WLP were on a fixed-term or temporary contract, with temporary workers

making up 26% of the workforce in logistics companies, as opposed to 15% in directly operated warehouses [7].

Furthermore, it is important to look at the territorial distribution of logistics activities and the workforce. A little over half of those in warehousing and handling occupations now work in towns with "concentrated" logistics zones, where there are at least three warehouses and logistics platforms (WLPs) of over 5,000m<sup>2</sup> within 2 kilometres of one another. However, these occupations represent on average only 3% of jobs there. In contrast, in certain "specialised" towns in or close to important logistics hubs on the outskirts of major cities (motorways, airports, river and seaports, railways), these occupations account for more than 20% of jobs. Against this background, the overhaul of the logistics landscape, amid the development of e-commerce and the reappraisal of large-scale distribution, presages sectoral spillovers, movements of labour and a major reconfiguration of logistics zones.

### Employment and skills management amid longstanding problems and an uncertain future.

It is against this background that public authorities, labour market intermediaries and employers are now trying to anticipate changes in the sector while at the same time seeking to address the jobs and skills management problems that employers in the sector have been talking about for several years. Measures have been implemented at various levels, including regional workshops bringing together local public stakeholders and employers, the introduction of strategic jobs and skills management in the sector at regional level or the increasingly common presence of a human resources manager in warehouses. The majority of these initiatives are designed to attract, train and retain the workforce, an ambitious objective in a highly competitive sector. Most of these experiments are taking place in local authorities with a high concentration of WLPs.

With respect to strategic jobs and skills management, the digital changes in logistics identified through regional strategic jobs and skills management initiatives lie at the intersection between the changeover to paperless systems, the networking of operations in the warehouse and, beyond these, an increase in output as a result of mechanisation, robotisation and improvements in its quality and fluidity (see Box 2). Given the uncertainties surrounding the current process of technology-driven change, the identification of common activities undertaken by handlers, order pickers, warehouse drivers, stock controllers and inventory managers opens up the prospect of more flexible working in warehouses as a means of safeguarding careers. This has resulted in the introduction of a modular common skills certification course that prepares students for the occupation of "polyvalent logistics agent" and leads to the award of a CCP (certificate of competence) or CQP (sectoral qualification). Similarly, occupational mobility platforms have been set up to safeguard and facilitate mobility and career changes.

*\* Warehouses and logistics platforms (WLPs) of over 5,000 m<sup>2</sup> incorporate all storage facilities and logistics operations such as order preparation, packaging and the acceptance and dispatch of merchandise. A logistics platform is an area where the merchandise is to be forwarded the same day, whereas a warehouse is a place where merchandise is stored for longer than a day.*

However, although the main skill expected of logistics workers is the ability to adapt to a digital and virtual environment, discussion with stakeholders in the sector tends to revolve around the notion of soft skills ("savoir-être"). Logistics needs to act quickly to attract young people who have few qualifications but are very adaptable, in a context in which local authorities are injecting resources to support initiatives in the sector. Despite a diversification of recruitment methods, many employers speak of gaps in soft skills, referring to a lack of punctuality, delays in completing work, unjustified absences, failure to comply with safety instructions and also problems in French and mathematics, particularly in urban logistics zones. The polysemous use of the concept of soft skills partially conceals the practical difficulties of getting to the workplace; WLPs are often located on the outskirts of cities and are badly served by public transport at the times when people are arriving at or leaving work, meaning that workers

## 2 New digital skills identified through territorial strategic jobs and skills management

Coordinating one's actions with automated handling, storage and palletisation systems



Controlling autonomous trucks (working in an automated environment)

Carrying out first-level maintenance on the connected objects usually found in warehouses

Interacting with robots



Integrating the "green" dimension into one's work and behaviour

Using new handling tools

Using the digital information management tools required to carry out the task

Managing and optimising flows using digital interfaces

Communicating and positioning oneself in digital and virtual environments



Source : Céreq, example of territorial strategic jobs and skills management in logistics at Saint-Martin-de-Crau, Bouches-du-Rhône.

### 3 Survey methodology and description

This issue is the result of a study conducted in three dynamic logistics zones in the Ile-de-France, Rhône-Alpes and Provence-Alpes-Côte d'Azur regions. The study focuses on how the anticipated revolution is being diffused and appropriated and on the tangible effects these changes are having on systems, work and employment in warehouses. Looking at digitisation plans and business strategies in the sector, the study seeks to ascertain the different types of changes that are taking place, over three timeframes: in the short term, the effects of digital technology on the work people do; in the medium term, changes in the production system and in worker profiles; and finally, in the long term, occupational boundaries and their reconfiguration. It draws on 12 interviews conducted with managers of warehouses and logistics zones, human resources officers, quality managers, logistics project managers (in the Regional Employment and Training Observatories or the Regions). Furthermore, this study is based on an analysis of experiments and projects in territorial strategic jobs and skills management conducted in Saint-Quentin-Fallavier and Saint-Martin-de-Crau, two towns that have high concentrations of logistics operations. Finally, the scoping exercise was based on visits to around 10 warehouses in Essonne, the northern Isère and Bouches-du-Rhône; an international literature review including prospective studies on the subject; visits to national logistics innovation exhibitions; and professional and academic symposiums, conferences and seminars on the topics of digital technology and logistics.

often have to be able to drive and have a car. So one of the first measures that needs to be put in place is a scheme to help young people to learn to drive, so they can enter the workforce more quickly. Other measures suggested include a campaign to promote careers in the sector and, more broadly, a "positive communications" campaign to counteract the sector's negative image, showing how new technologies can lead to improvements in working

conditions and portraying logistics as a provider of stable local employment.

Thus between an uncertain future and longstanding labour and employment problems, logistics appears to be a sector in which changes in production processes depend to a large extent on changes in retail distribution, a very similar manual labour industry that faces similar problems with regard to the development of e-commerce logistics. Currently, WLPs in France still seem relatively unaffected by large-scale technological developments, but the digital surge driven by the large groups is triggering an inexorable process of change in a highly competitive sector. This context raises particular questions about the dynamics of employment and working conditions, while a series of studies conducted in the United States has highlighted a potential deterioration in the years to come (see Box 1). As we are now talking about industry 5.0, emphasising the aspiration of putting human beings at the centre of an increasingly automated production process, there is still work to be done with regard to training in the logistics sector. This will involve helping the workforce to improve their skills rather than to adapt in a more restricted way to production processes. This can only be achieved if measures are put in place to safeguard careers. But this requirement is not nearly enough, particularly in a sector that is greatly influenced by large companies whose strategies are based on low prices and faster delivery times and whose business involves value chains that span international boundaries.

#### → Further reading

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- [3] *The Future of Warehouse Work: Technological Change in the U.S. Logistics Industry*, B. Gutelius, N. Theodore, Berkeley, CA: University of California, Berkeley Labor Center and Working Partnerships USA, 2019.
- [4] *Transport et Logistique - Rencontre interministérielle sur l'offre de certification et les métiers*, Kogut-Kubiak F. (coord.), Céreq Echanges n° 13, 2019.
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