Automation and the Importance of Reskilling Workers: A Case Study in the Automotive Industry

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Abstract: Rapid technological developments, especially the spread of automation and artificial intelligence (AI), have been transforming the world of work, raising some concerns about the future of employment. Automation presents both opportunities and challenges for the labor market. While we can expect productivity to grow with automation, and with-it economic growth, the fear of job loss linked to automation is also present. This paper aims to study the impact of automation on employment, with a special focus on the automotive industry, which stands out as one of the sectors most affected by automation. A second objective is to examine the reskilling procedures implemented by companies in this context, with a view to identifying effective strategies that bring benefits to both the employer and the workforce. To analyze the implications of automation in the automotive industry and the strategies adopted by companies to face these implications, we carried out an exploratory case study, using interviews, with the participation of four companies located in the districts of Minho, in the North of Portugal. The results show that, considering the impact of automation on employment, there is no negative impact since the destruction of some jobs was compensated by the creation of new ones. As for the reskilling procedures implemented by companies, results indicate that reskilling and upskilling are important strategies to prepare workers to transition to new jobs and tasks. Automation has been present in the automotive sector for many years and it has been gaining greater relevance over time. Businesses gain from several benefits provided by automation, including improved value for money, increased productivity, and increased worker safety. At the same time, they also face some challenges, such as high investment costs and workers' apprehension about transforming workplaces. Nonetheless, the investment pays off since companies invest heavily in reskilling their employees, and thus have a more qualified workforce that is prepared for any change that may arise. This paper contributes to a deeper understanding of the implications of automation in the labour market in the automotive sector and highlights the importance of workforce reskilling for the sustainability of companies. These findings are relevant for both employers and employees.

Keywords: Automation, Artificial Intelligence, Automotive Industry, Reskilling

1. Introduction

Recent years have witnessed rapid technological evolution, highlighting advances in automation and AI, which have the potential to significantly transform the workplace landscape. It is estimated that, by 2030, Europe could automate up to 22% of work activities (Smit *et al*., 2020). Automation presents both opportunities and challenges for the labor market. On the one hand, it can increase productivity and boost economic growth; on the other hand, it can reduce the demand for human labor in highly mechanized activities, raising concerns about unemployment, however, upskilling and reskilling the workforce can mitigate these impacts, enabling the transition to roles that require specific human skills (Manyika et al., 2017).

The aim of the paper is twofold: (i) to study the impact of automation on employment, with special focus on the automotive industry in Portugal, which stands out as one of the sectors most affected by automation and (ii) to examine the reskilling procedures implemented by the companies, to identify effective strategies that bring benefits to both the employer and the workforce.

This paper contributes to a deeper understanding of the implications of automation in the labour market in the automotive sector, and to highlight the importance of workforce reskilling for the sustainability of companies. For this purpose, an exploratory case study was carried out, using interviews, with the participation of four companies in the automotive sector located in the districts of Minho.

The paper is divided in three sections. First, a literature review is carried out on automation and its relationship with the level of employment, as well as on the requalification of workers. The following section presents the methodology used in the empirical work, the case study, with a qualitative approach carried out through

interviews with companies in the automotive industry in the Minho region. Finally, results are analyzed and discussed.

2. Literature Review

According to Groover (2002), automation can be defined as technology that performs tasks and processes without human assistance, through the application of mechanical and electronic systems. Its purpose is to increase productivity, reduce costs and improve product quality.

The term AI was coined by John McCarthy in 1956 to describe the science of manufacturing intelligent machines. However, progress in this area has been slower and it was not until the 1990s that there was significant development (Jiang et al., 2022). AI seeks to create intelligent machines capable of learning, reasoning, and making decisions autonomously.

The process of robotization is the implementation of automated systems that involves the use of robots, and it can combine automation and AI to allow robots to perform tasks independently. Robotization makes it possible to speed up work processes, reducing the workforce and minimizing errors (Lakshmi and Bahli, 2020).

Automation is part of a new concept, Industry 4.0, and the next production revolution (Squicciarini and Staccioli, 2022). The concept of Industry 4.0 was first introduced in 2011 by the German government, initially as a technological development strategy, later it was used to define the fourth Industrial Revolution (IR). According to Smit et al. (2016, p. 20), "Industry 4.0 highlights the organization of production processes of the entire value chain, based on technology and autonomous communication mechanisms". Currently, with the positive impacts and limitations of Industry 4.0, there are already references to the fifth IR, or Industry 5.0. The concept is still evolving; however, the aim is to achieve sustainable development for production processes, creating a balance between machine and human (Leng et al., 2022).

In professional terms, automation implies the replacement of human labor with machines or another form of automation technology, which leads to the displacement of workers from easily automated tasks (Acemoglu and Restrepo, 2018).

According to the study carried out by Nova SBE and CIP in 2019, Portugal is positioned in second place as the country with the greatest automation potential in the world, which means that the impact of this process should happen soon, contrary to what Manyika et al. (2017) say, ensuring that the impact of automation is not immediate. This potential for automation that the country presents is due to the excess of repetitive work activities in the industrial sector, especially in the automotive sector and in the textile sector (Nova SBE and CIP, 2019). While all sectors feel the consequences of automation, not all feel them in the same proportions (Milosevic., Ilic and Popovic, 2022).

In view of the difference between countries and regions, there is still a large difference between the educational level of workers and their age group. Middle- and low-skilled workers or older workers are at greater risk of automation, as they tend to occupy jobs with simpler, more repetitive functions. On the other hand, highly skilled or younger workers will adapt more easily to the changes caused by automation (Groshen and Holzer, 2019).

Nova SBE and CIP (2019) also add that the evolution in the phenomenon of automation in symbiosis with the reskilling of the workforce is an added value for both workers and companies since the change from low to high value-added tasks increases the productivity of both.

According to the Eurofound (2021), the implementation of automation in the labour market has implications for working conditions as well as employment. It is generally associated with job losses, i.e. the replacement of workers by machinery and equipment. However, automation also promotes the creation of new jobs, particularly in the technological field.

Frey and Osborne (2017), in a study on the susceptibility of work to automation, concluded that about 47% of jobs in the U.S. are at high risk of being replaced by automation in the next 10 to 20 years, namely in the transportation, logistics and manufacturing sectors, along with the bulk of office work and administrative support. Nedelkoska and Quintini (2018) consider that significant risk comprises an automation risk value between 50% and 70% and high risk assumes a value greater than 70%. In practical terms, according to Frey and Osborne (2017), 47% of jobs in the U.S. face an automation risk of more than 70%.

At the same time, Arntz et al. (2016) considered the heterogeneity of the countries studied, which means that the percentage of jobs at risk of being automated varies by country. Germany and Austria have a higher figure of 12%, while South Korea and Estonia have a lower figure of 6%. However, they have a common feature, that low-skilled and low-wage workers are mostly those who face a high risk of automation (Arntz et al., 2016). For Arntz et al. (2016) it is unlikely that automation will modify occupations on a large scale, but rather tasks inherent to certain occupations.

Borjas and Freeman (2019), cited by Groshen and Holzer (2019), estimate that each robot displaces about four to five workers from their workstations. However, Acemoglu and Restrepo (2020) estimated a lower figure of 3.3 workers displaced by each additional robot per thousand workers. These estimates were based only on the analysis of the industrial and manufacturing sector, where practically all industrial robots are implemented so far, but will be disseminated in the other sectors over time. According to Acemoglu and Restrepo (2020), the automotive industry employs the highest percentage of robots, followed by the electronics industry, with 38% and 15%, respectively.

AI and robotics are driving the creation of new jobs. However, most of these new jobs are a result of the overall increase in productivity that these technologies bring, which generate additional demand for labor (Hawksworth, Berriman and Goel, 2018).

The reskilling of workers becomes important so that they can develop new skills and acquire new knowledge for the future of work and to prevent unemployment caused by the phenomenon of automation. The WEF and PricewaterhouseCoopers (2021) also add that the focus on reskilling and upskilling people allows them to be active in economic development, reducing inequalities and improving social stability.

The skill level of workers, according to Nedelkoska and Quintini (2018), shows a pattern regarding automation, indicating that a higher skill level means a lower risk of automation. This means that the commitment to the requalification of the workforce is an important factor in avoiding the extinction of jobs.

In Portugal, the percentage of the population with a low level of education is quite high and considering that only one third of the population has digital skills above the basic level, according to Eurostat data from 2019, a reform of the vocational education and training system is necessary (OECD, 2021).

Choosing to lay off and hire people instead of going down the path of reskilling is the easiest way to respond to the transformations that are happening in the labour market. This is because companies see reskilling as a cost rather than a long-term investment. Hiring also entails its costs, which can sometimes be as high as the training that could have been given to obsolete employees (Weber, 2019).

The challenges of reskilling, presented in the Nova SBE and CIP report (2019), are, specifically, on the part of the government, the lack of centralization and coordination of public policies, on the part of workers, low qualification, on the part of the employer, the lack of financial incentives and, on the part of the labor market, many consider the investment made by companies in requalification to be a challenge. Since it does not present a direct return for them, this is because workers may eventually migrate to competition, also the lack of knowledge of workers is a challenge as it can sometimes limit their options and opportunities, and finally, the investment in retraining is considered lower than expected, which leads to state intervention to correct this market failure.

Arntz et al. (2016) identify low-skilled workers as being the most disadvantaged, as they mostly perform potentially automatable tasks, and if complementary tasks with automation become more complex and demanding, workers do not have the skills, nor qualifications, to keep up with change. Even resorting to reskilling can be difficult since the speed of the current revolution is much higher than previous revolutions.

However, according to Beaudry et al. (2013), cited in Frey and Osborne (2017), there has been a decline in the demand for qualified personnel in the last decade, even as the supply of workers with higher education continues to grow. What has happened in the labor market is that high-skilled workers have taken over occupations traditionally performed by low-skilled workers, which has caused low-skilled workers to perform occupations even further down the occupational ladder and may even drop out of the labor force. This raises the question of whether it will be possible to win the race against technology through education.

Governments have a key role to play in ensuring the correct use of the benefits of automation and mitigating the harm caused by automation to displaced workers (Groshen and Holzer, 2019).

Legislative, business and educational actions are needed at all levels to address the challenges of the new labour market (Moraliyska, 2021). Namely, investing in education and training, implementing legislation to protect workers' rights, among others.

According to Groshen and Holzer (2019), the creation of public policies to encourage employers to provide on-the-job training is quite important, especially for workers at risk of being displaced by automation.

In 2020, Portugal presented an Action Plan for the Digital Transition (PATD) based on three fundamental pillars: the empowerment and digital inclusion of people, the digital transformation of the business fabric and the digitalisation of the State.

One of the measures presented to promote employment in the digital area was the creation of models for the retraining of employed or unemployed workers. The PATD highlights that digital skills are increasingly important for the exercise of functions in different sectors of activity. Therefore, it intends to ensure this component at the different levels of qualification, that is, from initial training to higher education, not leaving aside training aimed at the unemployed population, intending to facilitate their re-entry into the labour market.

For the population in the labour market, the plan provides for a training programme in digital technologies to meet the needs of companies in terms of digital ascension.

Digital transformation is also one of the main pillars of the Recovery and Resilience Plan (RRP), which provides for reforms and investments to ensure the digital transition in Portugal (Portugal Digital, 2022).

In the Portugal 2030 strategy, it is intended to continue the public policies developed within the scope of the digital transition in the PATD and in the components of the RRP.

3. Methodology

To analyze the impact of technological innovations and automation in the automotive sector in the districts of Minho in Portugal, as well as the human capital reskilling processes adopted by companies to deal with these changes, the methodology used is the case study, using a qualitative approach through interviews. This approach allows us to gain a direct understanding of the perspectives and experiences of the individuals most affected by automation. Interviews are conducted in a way that fosters genuine dialogue, allowing interviewees to express themselves authentically and in-depth while achieving the objectives of the study (Quivy and Campenhoudt, 1992). The interview script[1] is divided into the following topics: the characterization of the company, the situation of the automotive sector, the situation of the company, employability, the reskilling of workers and, finally, the future of the automotive sector and automation.

3.1 Characterization of the Automotive Industry in Portugal

The automotive sector in Portugal encompasses both the manufacture and trade of automobiles. According to data from Banco de Portugal (2023), in 2022, there were a total of 18,028 companies in the sector, with a turnover of €33,589 million and 130,388 people employed. Automotive manufacturing, the subject of this study, represents 2.68% of the number of enterprises, 34.95% of turnover and employs 35.79% of people (Banco de Portugal, 2023).

In chronological terms, the automotive industry has followed a linear progression, with the exception of 2020, marked by the pandemic, which resulted in a significant decrease in turnover and the number of employees. After a fall in 2020, there was a recovery in subsequent years, although the number of manufacturers decreased in 2022, possibly due to the post-pandemic consequences, with the closure of 17 companies (Banco de Portugal, 2023).

3.2 Characterization of the Interviewed Companies

Four companies in the automotive sector in the districts of Minho participated in the study, as shown in Table 1. The interviews were conducted between September 29, 2023 and October 18, 2023.

[1] The interview guide may be obtained from the authors upon request.

Table 1: Characterization of the interviewed companies

Company	Location	Year of start	Activity	Number of employees	Turnover (million euros)
A	Lanheses – Viana do Castelo	2011	Exhaust gas recirculation systems	1400	264 (2022)
B	Lanheses – Viana do Castelo	2020	Paintings of decorative parts in plastic, aluminium and steel	84	4,5 (2023)
C	Arcos de Valdevez	2015	Light metal die casting	120	No data available
D	Vila Nova de Famalicão	1990	Production of tyres for cars and specialist tyres	2600	> 1000 (2022)

4. Results

The analysis of the interviews was structured and divided into the topics present in the interview script, to facilitate the analysis of the content of the interviews.

The results obtained through the content analysis were as follows:

4.1 The Situation in the Automotive Sector

The automotive sector is considered by the 4 companies under study as one of the sectors that is at the forefront in terms of their exposure to automation. This perception is based on the constant technological evolution that characterizes the automotive industry, as well as the increasing integration of automated systems in its production process (Anzolin, 2021). The interviewee from company D says: "I recognise that it has always been, from a historical point of view, perhaps the automotive industry has been at the forefront of development for a long time". The interviewee believes that the automotive sector is overtaken by other areas, however, he mentions that it is one of the main industries that takes advantage of these automation technologies for its development. The dynamics of the sector, according to the interviewees, is not restricted only to the automobile, but can extend to other industrial areas. In particular, sectors such as healthcare, where automation can improve clinical and diagnostic processes, the military industry, through the development of robotic systems and drones and autonomous vehicles, and the aeronautical industry, where automation contributes to operational efficiency and safety, stand out. Thus, the convergent view of the companies under study highlights that automation is a phenomenon capable of reshaping not only the automotive sector, but also other sectors. This highlights the need to look for strategies to deal with challenges and take advantage of opportunities that automation promotes.

4.2 The Company's Situation

Automation has brought significant benefits to businesses, including increased operational efficiency, better value for money, and increased worker safety.

Some companies, such as the case of Company B, are advanced in automating specific production processes, but are still far behind in terms of the potential of AI in production processes, "We don't have AI, it's a complicated area in the painting area. I know that there are experiences in this regard, there are factories in Germany trying to do a little application of these technologies, but it is still not very easy, especially for the detection of defects."

The Covid-19 pandemic has caused uncertainties and delays in the implementation of new automation processes, affecting companies' production and business.

Challenges include the substantial investment required, worker resilience and uncertainty regarding technological change, as well as unpredictable external factors that can impact the implementation of automation, such as political and public health crises.

4.3 Employability

In Company A, automation has been implemented gradually over time, which has not led to a reduction in the number of workers. New jobs have been created related not only to automation but also to business transition, and reskilling and upskilling strategies are adopted to train workers for new areas, "we cannot relate it to the

introduction of automation and new processes, it is related to this whole business transition, and it is through the business transition and new products with new ways of producing and skills that are needed".

In Company B, although automation did not lead to job losses, it also did not result in the creation of new ones. However, the factory director notes that if it weren't for automation, more workers would be needed in certain roles, "instead of a robot it would have to have two or three people 8 hours a day."

In Company C, where production is already highly automated, labor is reabsorbed into other areas or functions when new automation processes are implemented. Turnover strategies are used to ensure that workers acquire various skills, "people in logistics who are qualified to work with a melting furnace, we have people in machining qualified to work on an injection molding machine or to work on a CNC machine."

At Company D, despite the continuous growth in the number of employees over the years, automation has resulted in the disappearance of some jobs, but also in the creation of others, especially in the maintenance area, "because in some situations we will have to reinforce because we will start to have many more machines and equipment." Reskilling and upskilling strategies are also adopted to raise the skills of the workforce and minimize the impact of staff replacements.

None of the companies studied contributed to the increase in unemployment due to automation.

4.4 The Reskilling of Workers

Every company values reskilling as a key tool to keep its workforce prepared for the ever-changing challenges of the marketplace, regardless of the impact of automation.

Company A points out: "we don't just look at the current moment, but what is the next career step and how can we best qualify and prepare the person".

Company B highlights the need for training: "In the North it has not been very easy to find people with knowledge, some have knowledge of horizontal painting, more or less automated.

Company C highlights the importance of qualifying more people, proving that "we have absenteeism, although it is not very high, it exists, and therefore, we have to have the ability to move people from this to that position". This practice reflects the company's view that reskilling is a constant opportunity for improvement and development.

For company D, training "continues to be a significant slice of what is the budget that we have from the point of view of people management" every year.

4.5 The Future of Automotive and Automation

Company A believes that automation will replace repetitive tasks but is seen as an opportunity for workers to focus on more creative tasks. The company sees technological evolution as necessary for progress and highlights the importance of adaptation and learning. Regulation is considered crucial to ensure a controlled and safe environment in the world of work, "At work it will have to be regulated like anything else that is disruptive".

At Company B, although there have been advances in automation, challenges persist, especially in minute manual tasks such as checking for defects. The company sees automation as a way to improve the quality of life for workers.

In Company C, it is believed that some Human Resources functions will not be easily replaced by automation due to their emotional and human nature. The company anticipates a significant increase in the use of automation and AI across the board, with both challenges and opportunities for workers.

Company D sees automation as a necessary strategy to improve efficiency, especially in manual and repetitive tasks. The company emphasizes the importance of reskilling workers to stay relevant in the ever-evolving market.

Globally, the companies surveyed acknowledge that automation is inevitable for the future of the automotive industry but highlight the importance of regulation to protect workers' rights and ensure a safe and ethical work environment. In addition, the reskilling of workers is seen as key to meeting the challenges and seizing the opportunities brought about by technological evolution.

5. Conclusions

Automation is well established in the automotive industry, but it has evolved to encompass complex tasks beyond simple and repetitive ones. While businesses benefit from automation in terms of cost, productivity, and worker safety, there are challenges such as investment costs and worker adaptation to change.

The aim of this paper was (i) to analyze the impact of automation on employment, focusing on the automotive sector in the districts of Minho in Portugal, and (ii) to understand the importance of workforce reskilling for companies in the sector. The adoption of AI technologies is at an early stage in the automotive sector in the North of Portugal. Some companies have already taken their first steps by adopting small AI systems, while others have not yet made progress in this regard. The results indicate that (i) automation has no negative impact on employment, since the destruction of some jobs was compensated by the creation of new ones and (ii) reskilling and upskilling are important strategies implemented by firms to prepare workers for the transition to new jobs and tasks.

Companies have invested in in-house training to reskill their workforce and mitigate the potential impact of mass layoffs. Automation has shifted workers to control and supervisory tasks but has not shown significant implications for employment to date.

The study also highlights the lack of specific guidelines for automation and AI in Portugal, suggesting the need for regulation.

Although the findings are based on a limited sample, it represents a significant portion of the automotive turnover in Portugal. Thus, it is suggested, for future research, to expand the sample to other companies in the automotive sector and to apply the study in other sectors, such as health. In summary, the article offers a detailed overview of the interactions between automation, employment, and reskilling in the automotive sector in the Minho districts of Portugal.

References

Acemoglu, D. and Restrepo, P. (2018) "Artificial Intelligence, Automation and Work". In A. Agrawal, J. Gans and A. Goldfarb (Eds.), *The Economic of Artificial Intelligence: An agenda*, University of Chicago Press, Chicago, pp.197-236.

Acemoglu, D. and Restrepo, P. (2020) "Robots and Jobs: Evidence from US labor markets", *Journal of Political Economy*, Vol 128, No. 6, pp 2188 – 2244.

Arntz, M., Gregory, T. and Zierahn, U. (2016) *The risk of automation for jobs in OECD countries: A Comparative Analysis,* OECD Social, Employment and Migration Working Papers, No. 189, OECD Publishing, Paris.

Banco de Portugal (2023) *Analysis of the automotive sector*, Banco de Portugal, Lisbon.

Frey, C. B. and Osborne, M. A. (2017) "The Future of Employment: How susceptible are jobs to computerization?", *Technological forecasting and social change*, Vol 114, pp 254-280.

Groshen, E. L. and Holzer, H. J. (2019) "Improving Employment and Earnings in Twenty-First Century Labor Markets: An Introduction. RSF: The Russell Sage Foundation", *Journal of the Social Sciences*, Vol 5, No. 5, pp 1-19.

Groover, M. P. (2002) *Automation, Production Systems, and Computer-Integrated Manufacturing*, 4th Edition, Pearson Higher Education, London.

Hawksworth, J., Berriman, R. and Goel, S. (2018) *Will robots really steal our jobs? An international analysis of the potential long term impact of automation,* PricewaterhouseCoopers, London.

Jiang, Y. *et al.* (2022) "Quo vadis artificial intelligence?", *Discover Artificial Intelligence*, Vol 2, No. 4

Lakshmi, V. and Bahli, B. (2020) "Understanding the robotization landscape transformation: A certering resonance analysis", *Journal of Innovation and Knowledge*, Vol 5, No. 1, pp 59-67.

Leng, J. *et al.* (2022) "Industry 5.0: Prospect and retrospect", *Journal of Manufacturing Systems*, Vol 65, pp 279-295.

Eurofound (2021) *The digital age: Implications of automation, digitisation and platforms for work and employment*, Challenges and prospects in the EU series, Publications Office of the European Union, Luxembourg.

Manyika, J. *et al.* (2017) *Jobs Lost, Jobs Gained: Workforce Transitions in a time of Automation*, McKinsey Global Institute, New York.

Milosevic, D., Ilic, D. and Popovic, J. (2022) "Digital Transformation Impact on Jobs after COVID-19 Pandemic", *Ecoforum Journal*, Vol 11, No. 1, pp 1-8.

Moraliyska, M. (2021) "Factors for the Future of Work and their Impact on the European Economy and Labour Market". In M. Bilgin, H. Danis, E. Demir and S.Vale (Eds.), *Eurasian Economic Perspectives: Proceedings of the 29th Eurasia Business and Economics Society Conference*), Springer, New York, pp. 297-315.

Nedelkoska, L. and Quintini, G. (2018) *Automation, skills use and training*, OECD Social, Employment and Migration Working Papers, No.202, OECD Publishing, Paris.

Nova School of Business and Economics and Business Confederation of Portugal. (2019) *The future of work in Portugal: the imperative of reskilling: final report*, Nova School of Business and Economics and Business Confederation of Portugal, Lisbon.

Organisation for Economic Co-operation and Development (2021) *OECD Economic Studies – Portugal*, OECD Publishing, Paris.
Portugal Digital (2022) *Portugal, Digital Nation – 2 years of Digital Transition*, Portuguese Republic, Lisbon.
Quivy, R. and Campenhoudt, L. (1992) *Manual de Investigação em Ciências Sociais*, Gradiva, Lisboa.
Smit, J. *et al.* (2016) *Industry 4.0: Study for the ITRE Committee*, European Parliament, Brussels.
Smit, S. *et al.* (2020) *The future of work in Europe: Automation, workforce transitions, and the shifting geography of employment,* McKinsey Global Institute, New York.
Squicciarini, M. and Staccioli, J. (2022) *Labour-saving Technologies and employment levels: Are robots really making workers redundant?,* OECD Science, Technology and Industry Policy Papers, 124, OECD Publishing, Paris.
Weber, L. (2019) *Why Companies are Failing at Reskilling*. The Wall Street Journal. https://www.wsj.com/articles/the-answer-to-your-companys-hiring-problem-might-be-right-under-your-nose-11555689542
World Economic Forum and PricewaterhouseCoopers (2021) *Upskilling for Shared Prosperity: Insight Report,* World Economic Forum, Cologny.