



## Factsheet Robotics and the quality of work A knowledge synthesis

More and more robots are being used in the workplace, and that's affecting the quality of work: workers' income and job security, how much work pressure they feel, the meaning of work, and the opportunities for caring and learning alongside their work. Robotization is having an impact on people's wellbeing. One of the effects of robotization is that low-skilled jobs in industry in particular are disappearing. At the same time, robotization also offers social opportunities. That's why it's important to pay attention to the meaning of work and to involve employees in decisions that influence their work. This will affect both how organizations work and the quality of society. Employers, employees and the government should start with an agenda on robotization that addresses the opportunities it can offer, and the risks it can pose, on the labour market in the coming years. This point emerges from the study *Robotization and the Quality of work* that the Netherlands Institute for Social Research (SCP) has put out as part of the series *The Changing World of Work*.

### What is robotization?

- Robotization is the process whereby more and more work is being done by robots: industrial robots, such as robotic arms that are used in the production of cars and electronics, but also professional service robots such as inspection robots, robot-assisted surgery, milking robots, and automatically guided vehicle systems that are used in warehouses and distribution centers.
- In the years before the coronavirus crisis, anywhere from 1,000 to 1,500 new robots were put into service each year in the Netherlands, where a total of 1,444 new industrial robots were purchased in 2017, according to figures from the *International Federation of Robotics*. The number of robots in industry increased more than fivefold between 2008 and 2018. There are no exact figures available on the number of professional service robots that have been put into service in recent years.

### What is the state of robotization in the Netherlands?

- Although robots have been making their appearance in companies for some time now, robotization is still a relatively new phenomenon. Whereas in many of the countries bordering the Netherlands the use of robots in the business world has increased markedly since 2000, in the Netherlands itself this trend had a later start. While there were just 93 robots per 10,000 workers in the Netherlands in 2013, that figure had more than doubled in the space of six years, to 194 in 2019.
- Despite the growth in the number of robots, only a relatively small proportion of all workers actually works with robots in their workplace. This is partly because the manufacturing industry in the Netherlands is smaller than that in those countries where robotization is farther along. The larger service sector in the Netherlands means there is less of a call for robotization. In addition, the Netherlands has a relatively large SME sector and many self-employed people, while the

current generation of robots is primarily suited to large industrial companies. Figures put out by Statistics Netherlands in 2018 show that, of companies that had 10 or more employees in the Netherlands, about 7% use robots—primarily industrial robots (6%). Only 1% of these companies use a service robot.

### Will robotization continue?

- The general expectation is that the number of robots used both around the world and in the Netherlands will increase over the next ten years. This is because robots are being developed further and being more widely deployed. Market researchers estimate that sales of robots will have fallen by just under 4% in 2020 because of the corona crisis, but they expect growth to resume starting in 2021. The influence of previous crises on the introduction of technology in the business world has always been quite short-lived. This reinforces the expectation that the pace of robotization will pick up again in the next few years.
- In addition to economic developments, the pace at which companies embrace robotization will depend mainly on technological developments, on how much robotization costs, and on the extent to which increasing robotization meets with social acceptance. The coronavirus crisis may have slowed down the continued development of robots. On the other hand, there may now be a greater acceptance of the use of service robots in the distribution centers of e-commerce companies.
- It is expected that the greatest growth in the use of robots will be in the deployment of professional-service robots, which will be used primarily in healthcare and other sectors beyond industry where staff shortages will make the use of robots more appealing. In industry, the number of cobots—robots that collaborate with humans—is expected to grow. Although cobots are slower than traditional industrial robots, they can be used more flexibly in work processes.

### Robotization and the quality of work

- Empirical studies differ on the impact that robots will have on employment, but for several European countries it is estimated that the purchase of one industrial robot will result in the loss of between two and three jobs. This is a net effect. That is, the number of workers who will see their work taken over by a robot will be higher, since robotization will also create new jobs. If the number of robots continues to grow, the annual net loss of jobs will be between 1,600 and 4,200.
- The effect of job losses is likely to be cushioned by the fact that the Netherlands has a relatively strong service economy. A shift from traditional industrial robots, such as robotic arms, to cobots is also expected to result in fewer job losses.
- Those who are less well educated are most likely to see their jobs disappear as a result of robotization. Those with a higher

education or who are technically skilled, by contrast, are likely to see their job security increase. This also applies to employees' wages. The wages of those who are less well educated will be squeezed, while the incomes of those with a higher education are likely to increase.

- Studies on the effects of robotization on work pressure, and on the extent to which employees regard their work as meaningful, make it clear that these effects depend to a large extent on the way in which the work is organized at the workplace. If robots are introduced to support workers in their tasks, the work pressure is likely to go down. However, work pressure may also increase if all mundane or straightforward tasks are automated. That can make work more stressful and less varied. The lack of a healthy mix of challenging and routine work can produce work pressure and stress. Workers stand to lose out if they have to follow the robot and have little discretion in their work.
- The degree to which workers find their work meaningful also depends to a large extent on the choices that organizations make. When the interests of, and the consequences for, workers themselves are taken into account, robotization is more likely to enrich the quality of work.

### What can the government and the social partners do?

- The opportunities robotization can offer for, and the risks it can pose to, the quality of work will have to be closely monitored. It is also important that workers be involved in the introduction of robots to businesses. That will reduce the likelihood that robots will be perceived as a threat.
- The scp argues that work-to-work schemes and a continued commitment to training and developing workers can counter the adverse effects of more and more robotization. This can be done by training workers on how to support or check the work done by robots, or by giving them a say in how robots are used in the workplace. We need to look at how workers who are unable to upskill to other work for the longer term can get other suitable work, maintain a reasonable income, and lead meaningful lives. Employees and employers, along with the government, must take up their responsibilities here.
- So far, little research has been done on how robotization affects the amount of work pressure that employees feel, or on the extent to which they find their work meaningful. Building up knowledge in this area in the coming years will make it possible to make targeted adjustments. It will also do greater justice to how people experience their day-to-day work. The scp is calling for an agenda on robotization that is focused on the quality of work across the board. This way, the opportunities robotization offers can be exploited from a business but also from a social perspective. That will allow investments in the quality work to pay off for individuals, businesses, and society. Employees and employers, along with the government, must take up their responsibilities here.

### The Changing World of Work series

- This publication is part of an scp series entitled ‘*The Changing World of Work*’, which looks at the quality of work in the years ahead. Developments in the labour market need to be closely monitored, because they have an impact on the wellbeing of individuals, the functioning of organizations, and the quality of society as a whole. As well as providing an income, high-quality work can also give meaning to people’s lives and foster their personal development. It also means they can structure their lives in such a way as to combine working, caregiving, and learning in a sustainable way.
- By bringing together knowledge about the consequences of labour-market developments for workers, the scp is helping build a knowledge base for a future-proof labour-market policy that benefits both workers and society as a whole. Robotization is the second theme in this series. Based on an extensive study of the literature and on interviews with experts, the consequences of robotization for the quality of work have been set out. In this study, the scp focuses mainly on payment for work, job security, work pressure, the meaning people derive from their work, and the scope they have to combine work with both their personal lives and their own development. Earlier in this series, research was published on the effects of platformization on the quality of work. Later this year, the study on combining paid work with caregiving tasks and learning will follow.

For more information, see *De veranderende arbeidsmarkt* (in Dutch only) at [www.scp.nl](http://www.scp.nl).

### Colophon

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