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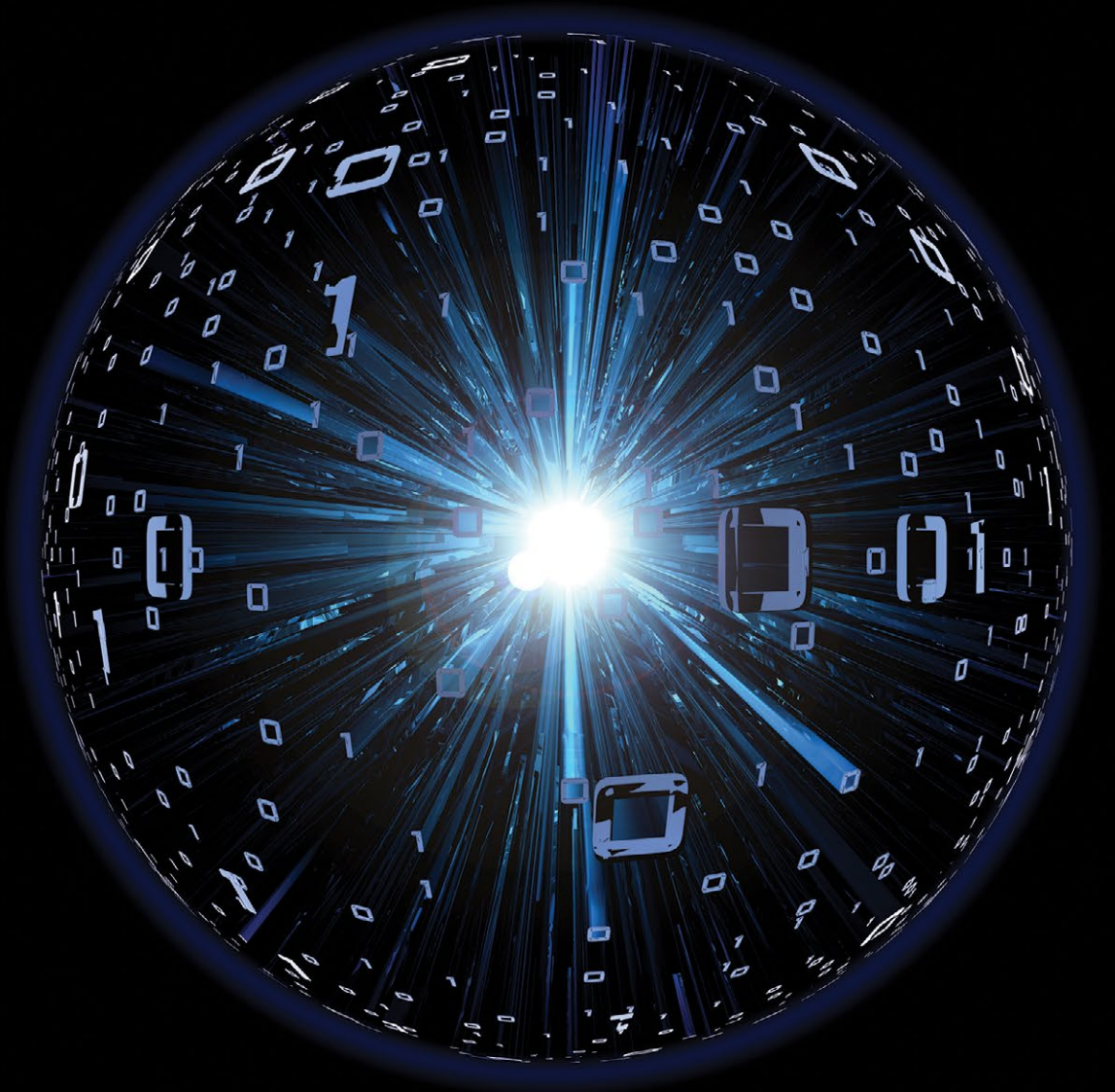
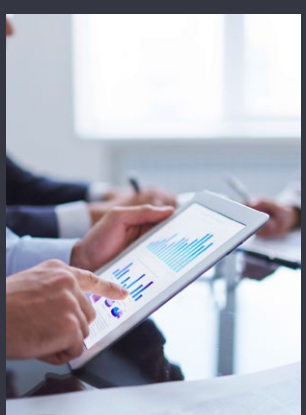


Transforming the Swiss economy

The impact of automation on employment and industries

Acknowledgement
Deloitte wishes to express its sincere thanks to all executives and experts interviewed for this study for interesting exchanges of view and valuable input.

Contents



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Key findings

Automation creates jobs

Automation has had a positive impact on the Swiss labour market. In the past 25 years, net job creation has topped 800,000, with automation accounting for many of these new jobs. Automation cuts the cost of many goods and drives up wages, increasing demand and creating employment. For this reason, it is unlikely that we will be running out of work over the next few years. On the contrary: forecasts indicate that roughly 270,000 new jobs will be created in Switzerland by 2025.

Impact varies between industries

Automation is having a differing impact on individual industries of the Swiss economy. Agriculture and forestry have the highest proportion of employees in jobs with a high likelihood of automation (76%), while the public administration, health and social services (17%), and information and communication sectors (19%) are the least likely to see jobs being automated. In absolute terms, the commerce, transport and logistics sector has the highest proportion of jobs likely to be automated.

Industries opting for a wide range of innovations

The Swiss economy is considering a wide range of innovations. In the manufacturing industry, industrial robots and 3D printers are becoming increasingly important, while many retail companies are moving to automated sales and checkout systems. Drones and driverless vehicles are likely to feature in the transport system in the near future, and digital asset management and robotics are major trends in the financial services industry. E-government, finally, is bringing automation to public administration.

Automation brings many advantages

Increasing automation brings considerable advantages for companies. It enables production processes to be optimised, costs to be cut, production quality to be increased, land use to be reduced, and interactions between customers and suppliers to be improved. Jobs become more interesting, increasing employee satisfaction and boosting companies' ability to attract a skilled workforce. In particular, cooperation between man and machine also enables companies to increase employee productivity and offers an alternative to outsourcing and offshoring.

How can companies benefit?

If these advantages are to be exploited, companies need a coherent strategy, they must assess available technologies, implement automation on a step-by-step basis, and anticipate and prepare adequately for all potential risks.

2

The impact of automation on the labour market

Since the beginning of the first industrial revolution, technological innovation – from steam engines and electricity through to assembly lines and computerisation – has brought about major change, not least in the world of work. At the beginning of the 19th century, almost 70 per cent of Swiss employees worked in agriculture and 8 per cent in the service sector.[1] Just over 200 years later, the situation has been reversed, with only 3 per cent of all employees working in agriculture and 75 per cent in the tertiary sector.

Technological advances and the global distribution of labour have given rise to far-reaching changes in employment and regularly trigger fears of mass unemployment. The most recent resurgence of these fears coincided with the publication in 2009 of Martin Ford's "The Lights in the Tunnel", in which the author warns of the risk of significant growth in unemployment as a result of automation.[2] This is hardly surprising, given the major technological advances made over recent years. Cars can now largely drive themselves, 3D printers are capable of producing a wide range of products and software outperforms doctors in diagnosing certain diseases. But is the workforce really on the way to becoming redundant on the labour market?

Automation and employment

The impact of automation on employment can be divided into two main types: substitution effects and complementary effects. Substitution occurs where a machine replaces human labour. On the basis of research by the University of Oxford[3] a Deloitte study[4] focuses on this substitution effect, showing that 48 per cent of all Swiss jobs could in principle be automated. It demonstrates the scale on which jobs could, in theory, be taken over by machines because of their profile. However, this study considers only the potential for actual job losses rather than the impact on total employment.

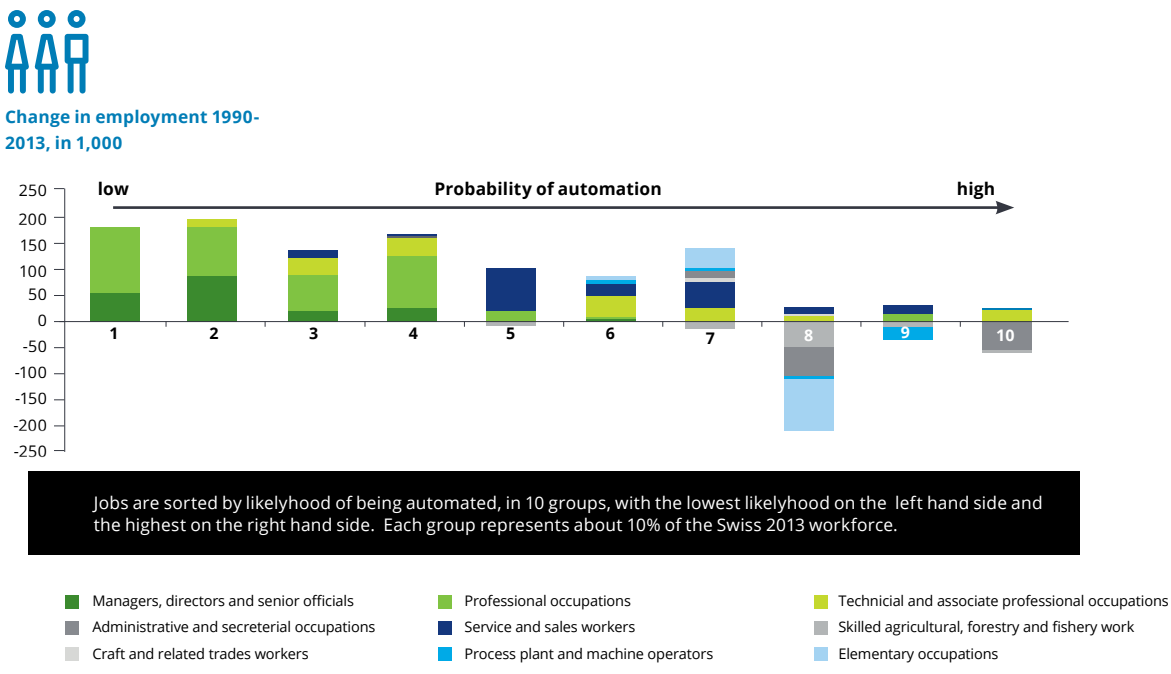
Automation may, in fact, also create jobs through complementary effects. These complementary effects must also be included in any assessment of the impact automation has on total employment. Where man and machine are deployed in a complementary way in the production process, productivity rises and so, too, does pay. Automation can also bring down the cost of the goods being produced. For example, the cost of footwear and clothing is now substantially lower as a result of mechanical production. Higher pay and lower prices boost workers' purchasing power, fuelling demand for goods and services and, ultimately, creating new jobs. Moreover, employees are also needed to produce the machinery and new technology needed to automate the economy.

The situation in Switzerland: A historical analysis

According to research by David Autor, an economist at Massachusetts Institute of Technology MIT and expert in the area of automation, observers frequently under-estimate how many new jobs technology will create (the complementary effects)and frequently over-estimate job losses (the substitution effects).[5] To date complementary effects have dominated. Since the earliest days of industrialisation and the first major wave of automation, employment in industrialised countries has risen substantially over the medium to long term. A recent study by the Centre for European Economic Research shows that automation has also had a positive impact on the demand for labour over the last ten years.[6]

A recent Deloitte study reaches a similar conclusion. It finds that, over the past 25 years, a net balance of 800,000 new jobs (including part-time posts) have been created in Switzerland.[7] There are, of course, a number of reasons for this, including demographic change and economic growth, but it is likely that automation has played a major part. The study breaks down Frey and Osborne's estimates of the likelihood of automation across differing occupations and compares these figures with actual employment growth (see Box), producing a negative correlation (see Figure 1). In other words, the lower the likelihood that jobs in a given sector will be automated, the higher the actual growth in employment in that sector.

Figure 1. Employment growth and automation 1990-2013



Sources: Frey and Osborne (2013); Deloitte analysis; ISCO-08 major occupational groups (International Standard Classification of Occupation)

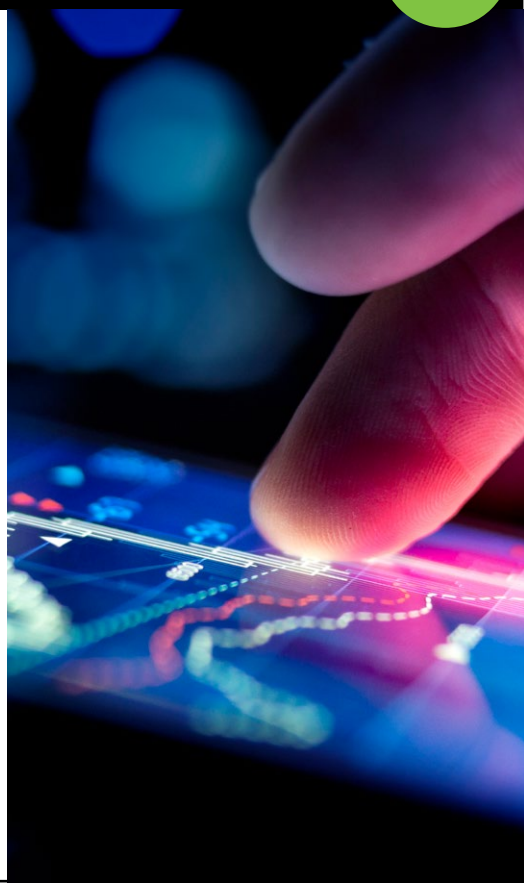
Employment in the occupations on the left-hand side of Figure 1 – which are the least likely to undergo automation – has risen markedly and include predominantly graduate professions and managerial occupations. Those on the right-hand side are mostly administrative and elementary occupations that require low and medium skill levels. The likelihood that any occupation will be automated decreases as the training needed for that occupation increases.

However, employment in some less skilled occupations is also growing despite automation. Overall, jobs are certainly being lost as a result of automation, but new jobs are also being created. And since job creation has significantly outstripped job losses, the complementary effect appears to have outweighed the substitution effect.

Box: Likelihood of automation

In a wide-ranging study, Frey and Osborne (see endnote 3) rated the likelihood of automation in 702 of the total 840 occupations listed in the US Standard Occupational Classification (SOC). This rating indicated how easy it would theoretically be to replace human labour with machines over the next 20 years or so. Three main factors were found to be particularly crucial to this rating: perception and manipulation, creative intelligence and social intelligence.

On the basis of an official conversion chart, Deloitte has allocated these automation likelihood ratings to Swiss occupations classified by the Swiss Federal Statistical Office using ISCO-08 classifications. Of a total of 528 Swiss occupational categories, 353 were allocated a likelihood rating, so the analysis covered around 90 per cent of the total workforce.



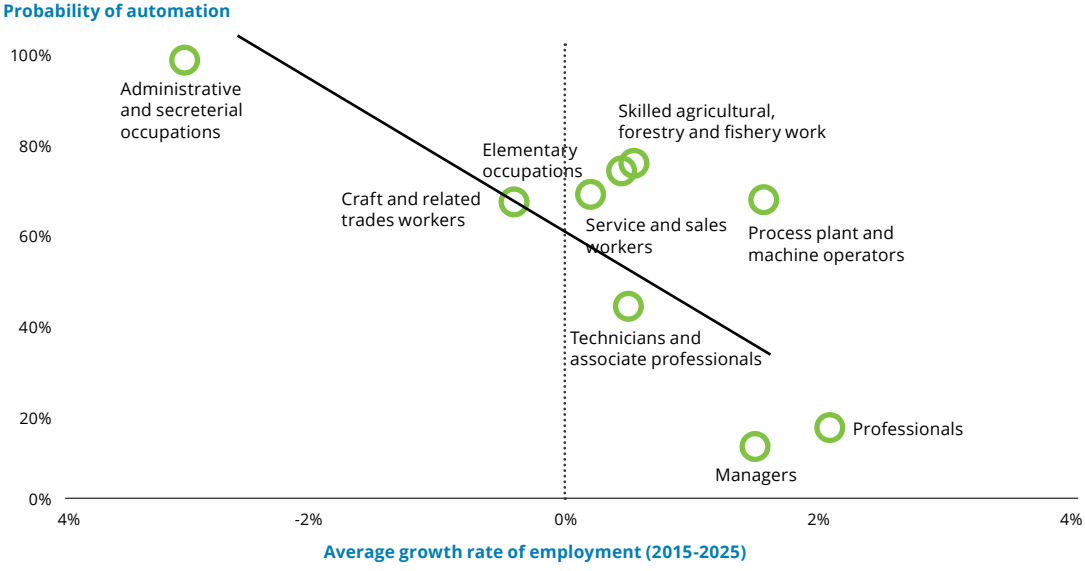
The situation in Switzerland: Looking to the future

As well as historical comparisons of the likelihood of automation with actual employment trends, more recent statistics also indicate that the complementary effects of automation are likely to continue to outweigh substitution effects. On the basis of employment forecasts by the European Centre for the Development of Vocational Training (Cedefop), Deloitte has compared the likelihood of automation with projected future employment growth in the nine major International Standard Classification of Occupation (ISCO) groups between 2015 and 2025. As Figure 2 shows, the negative correlation between the likelihood that a particular occupation will be automated and employment growth in that occupation remains marked over this period. Automation will continue to have a strong influence on the Swiss labour market and to drive structural change, but it is likely that job creation will continue to outstrip job losses. Employment forecasts indicate that a net total of around 270,000 new jobs will have been created by 2025.[8]

Computers are increasingly able to recognise language and generate simple texts, so clerical employees with lower skill levels are the occupational group most likely to come under pressure from automation. Forecasts indicate that the number of jobs in this group is likely to fall by three per cent a year between now and 2025.

Job creation, by contrast, is most probable in highly skilled and knowledge-intensive occupations that are very unlikely to be capable of complete automation, such as medicine, architecture and engineering. The complementary effect is particularly marked in these occupations: the use of new technology means that those employed in them are able to do their work more efficiently, which will create new jobs.

Figure 2. Employment growth and automation 2015-25



Sources: Frey and Osborne (2013), Cedefop, Deloitte analysis

Future opportunities on the labour market

As our historical analysis has shown, it is broadly the case that the likelihood of automation falls as skill level rises. This is likely to remain the case over the next ten years: forecasts show that by 2025, Switzerland will need twice as many employees with advanced training as it did in 2005.[8]

However, this correlation does not apply across the board. Although training is crucial, it is not the only factor involved in future-proofing areas of employment. In occupations in which social interaction is important, for example, human labour will have the edge over machines for a long time to come. Examples include hairdressing, childcare, and nursing and health care – occupations that otherwise require a low to intermediate skill level. There will also be a demand for new interface functions: although machines can often carry out discrete tasks more efficiently than humans, they are often unable to network these tasks with preceding or following stages in a process, for example with customers or suppliers. The complementary use of technology and artificial intelligence may also enable those with lower skill levels to do higher value-added jobs, particularly where service interfaces are being simplified and barriers to the use of technology are being dismantled. For example, touchscreens are increasingly replacing complex input forms. They are easy to master because they function like smartphones and tablets, and since many people already make substantial personal use of touchscreen technology, they already have the aptitude to use it professionally, although specific meta-skills are needed to use these applications productively. These meta-skills include, for example, language skills, data processing skills and reliability. Overall, however, it is clear that further automation will open up job opportunities across all skills levels.

"The dual vocational training system and close collaboration between universities and the private sector mean that Switzerland is well equipped to face the future."

Eugen Elmiger
CEO Maxon Motor

"Standard processes are being automated, with the result that non-standard processes are now the focus of our attention. We still need – and always will need – people to meet individual needs."

Achim Schneider
Head of Ground Services Development, Swiss International Air Lines

3

The impact of automation on selected industries

No other industry illustrates the impact of automation more clearly than manufacturing. Over recent years, factories and production plants have undergone a transformation, with entire production processes being automated in some cases. The World Robotics Survey claims that more robots are now in use than ever before: in 2015, a total of 260,000 industrial robots were sold, more than double the 2010 figure, and this number is likely to rise again to 400,000 by 2018.[9]

The use of robots is growing in other industries, too. Machines are currently being developed to support human activity across all areas of existence. Not only can these machines take over structured production processes, they can also learn, recognise and adapt. They include, for example, driverless cars, image recognition systems and smartphone assistants. All these applications are a form of artificial intelligence, and some are already in use across a range of industries, including transport, information and communications technology ICT and health.

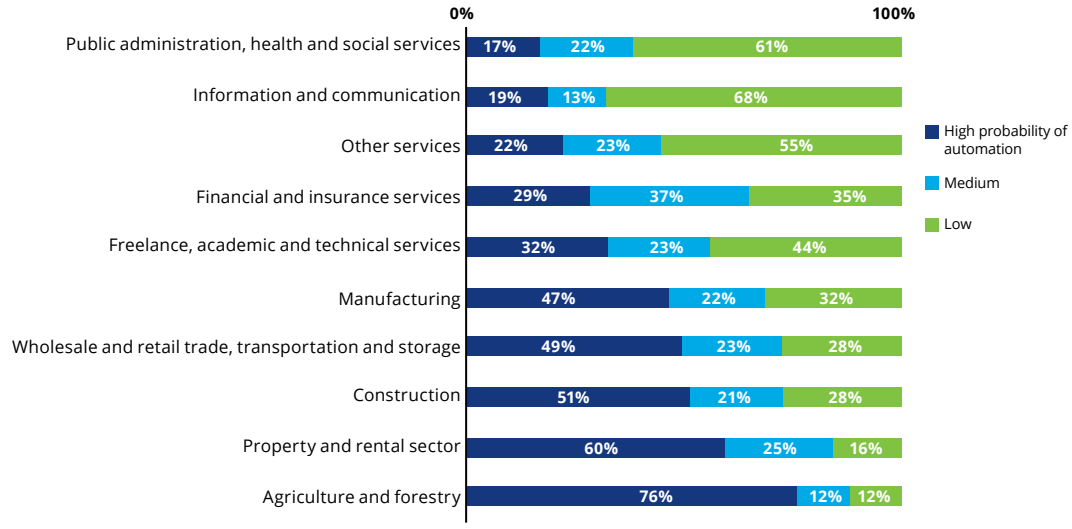
Automation and employment by industry

An analysis of the likelihood of automation by industry using the Swiss General Classification of Economic Activities (NOGA) classification illustrates how marked the impact on employment within individual industries is likely to be over the new few years. The allocation of occupations to high-likelihood (>66 per cent), medium-likelihood (>33 per cent to 66 per cent) and low-likelihood groups (0 per cent to 33 per cent) is based on Frey and Osborne (2013).[3]

These ratings illustrate how easy it would theoretically be to automate specific occupations. This analysis is, therefore, limited to the substitution effect and should not be seen as reflecting actual changes in employment.

As Figure 3 shows, agriculture and forestry have the highest proportion of jobs with a high likelihood of automation (76 per cent). At the other end of the spectrum are jobs in public administration and health and social services, of which only 17 per cent have a high likelihood of automation. 61 per cent of employees work in occupations with a low potential for automation.

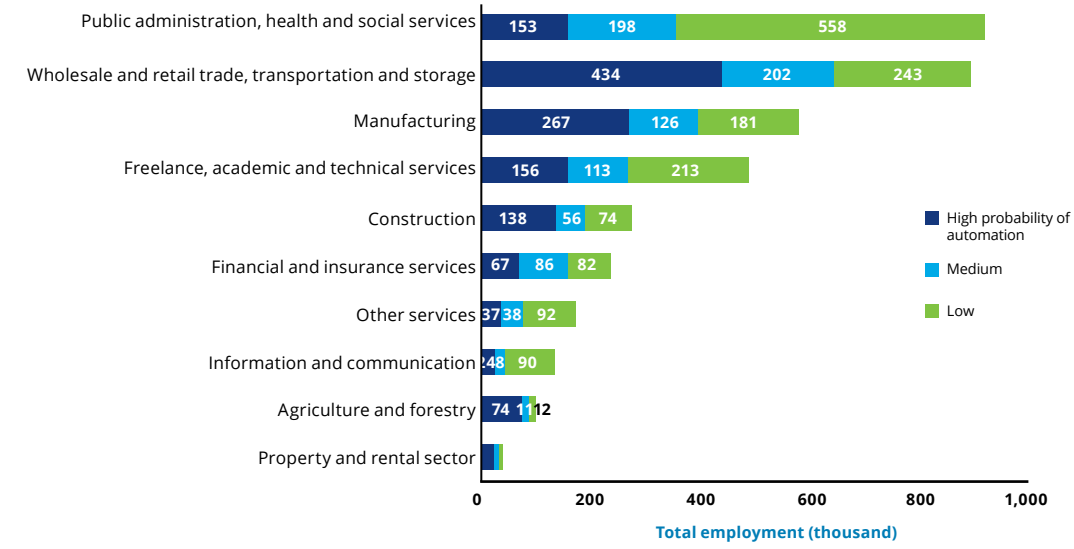
Figure 3. Probability of automation by industry (2013)



Sources: Swiss Federal Statistical Office, Frey and Osborne (2013), Deloitte analysis

As Figure 4 illustrates, public administration and health and social services also has the highest absolute employment levels within the Swiss economy, closely followed by wholesale and retail trade, transportation and storage. Although the agriculture and forestry industry has the highest percentage of employees whose jobs are likely to be automated, the figure is, therefore, relatively insignificant in terms of total employment. Wholesale and retail trade, transportation and storage not only has a relatively high proportion of jobs likely to be automated, but also a high absolute number of employees in such jobs.

Figure 4. Probability of automation and employment by industry (2013)



Sources: Swiss Federal Statistical Office, Frey and Osborne (2013), Deloitte analysis

Public administration, health and social services

The proportion of employees in occupations with a high likelihood of automation is smallest in public administration and health and social services (the largest industry in the Swiss economy). In other words, almost two-thirds of employees are in jobs with a low likelihood of being automated – just under 560,000 people in all.

There are two main reasons for this. First, the industry employs a high proportion of highly skilled individuals[10]; and second, interpersonal contacts are important. Robots do not perform well in this latter respect, particularly in health and social services, and this industry look set to see particularly strong employment growth over the next few years as the population continues to age, increasing the demand for labour. However, personal interaction is also important in many areas of public administration, including in the roles played by judges, police officers and teachers, and in areas such as authorisation of public works contracts. These interactions frequently involve much more than just an exchange of information: they require complex negotiation, decision-making in special cases and, particularly, the ability to process or even to recognise exceptions to standard procedures. The largest occupations with a low likelihood of automation include primary and secondary teachers (110,000 employees; ten per cent likelihood), medical care staff and healthcare assistants (105,000 employees; six per cent and thirteen per cent likelihood respectively), and doctors (35,000 employees; two per cent likelihood).

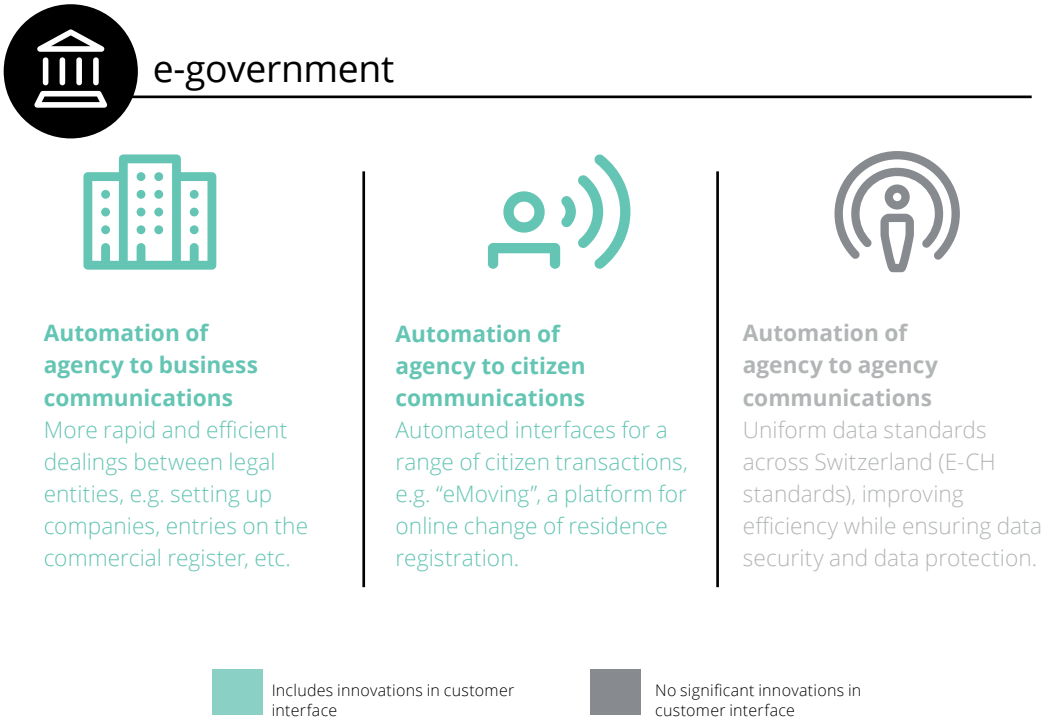
By contrast, general clerical staff, of whom 34,000 work in public administration and health and social services, have a 97 per cent likelihood of having their jobs automated. However, these figures differ across the federal structure: in some cases, administrative units are small-scale and localised, so automation brings less significant economies of scale. For standard processes in these areas, there is scope for creating shared service centres serving a number of administrative units.

The relatively low proportion of jobs with a high likelihood of automation should not, however, detract from the fact that many processes within public administration and health and social services have the potential for (further) automation. The use of new technology in these cases would mean that many employees would be able to do their jobs more efficiently, boosting productivity. This, then, would be a case of automation having the complementary effects described in Section 2.

Box: Public administration: e-government and digitalisation of processes and data flows

The trend towards automation has extended to the public sector over recent years. Greater automation is evident in communications both with individuals and with agencies. However, electronic communication between public sector agencies themselves is also now expanding markedly (see Figure 5) and brings a number of advantages (see Figure 6).

Figure 5. Elements of e-government/digitalisation



More and more e-government services are now available to individual citizens, and the range is likely to increase further as identification and authentication solutions become more widely available. Citizens will have less and less need to go in person to government offices. Processing of service data also offers potential: such data must be capable of being standardised and processed automatically without media discontinuity. This is essential to achieve the goal of efficient administration that brings down process costs and improves data quality.

Figure 6. Advantages of e-government/digitalisation

However, automation is also simplifying and speeding up communication with companies. From work permits and changes in commercial register entries to the processing of tax data, simplified processes and procedures are likely to bring process costs down substantially.

If official agencies are to be able to communicate with each other more efficiently both at the same level within Switzerland's federal system and between levels, it is also important that common standards are defined and applied. This process has been under way for some years, but there is still potential in this area.

Finally, politics also needs to play its part in driving forward automation. Legislation and regulations need to be adapted to allow businesses to seize the opportunities digitalisation offers and tackle the challenges it poses. To secure the necessary popular acceptance, data protection and data security must always be paramount, while services must also be straightforward and user-friendly.

Wholesale and retail trade, transportation and storage

In the wholesale and retail trade, transportation and storage industry, virtually half the workforce (around 430,000 people) is in a job with a high likelihood of automation. No other sector comes close to such a high absolute figure.

This high proportion of jobs that are likely to be automated may be attributed among other factors to the fact that the industry employs around 117,000 sales staff, jobs that have a 95 per cent likelihood of being automated. There are also 47,000 general clerical staff in the industry and 11,000 cashiers, whose jobs have a 97 per cent and 90 per cent likelihood respectively of being automated.

Machines are already able to take over virtually all the roles performed by sales staff and cashiers (see Box). Nevertheless, many commercial companies – particularly in retail – are opting for a mix of automated and human-operated sales and payment systems. This is likely to reflect customer preferences (certain customer groups are disinclined to use automated checkouts, for example), but also the social interaction factor, which can be important for sales staff.

Since the Swiss National Bank removed the exchange rate floor for the Swiss Franc against the euro in early 2015, 'shopping tourism' has placed substantial pressure on Swiss commerce. This has driven substantial automation. To remain competitive, increasing numbers of companies are opting for greater automation through digitalisation, and the sector association Handel Schweiz (Swiss Trade) expects investment in digitalisation over the next five years to total CHF 4 billion.[11]

"Self-scanning and self-checkouts are widely accepted by our customers: there are more checkouts available, and queuing times are shorter."

Martin Haas
CIO Migros

Box: Retail and transportation: self-scanning and self-checkout

Automation increasingly affects not just staff within businesses but also customers. Changes in IT applications mean that customers are now carrying out activities that were previously done by paid employees. A good example is the self-scanning and self-checkout systems in retail outlets. The supermarket chain Migros introduced such systems in 2011 and has been rolling them out across its network of branches since then. Although fewer checkout staff are required as a result, it is rare for jobs to be lost across the company: in fact, in some cases, employment has actually gone up because some of the employees concerned have taken on new roles, such as advising customers on using the self-scanning and self-checkout systems, while new jobs have been created in maintaining and assessing the data that support the automated systems.

The advantages of such automation for companies include greater efficiency and better use of space but also higher levels of customer satisfaction. When self-scanning and self-checkout systems are complementary, rather than substitutive, and when customers have a choice between conventional and automated checkouts, the staff are better able to satisfy individual customer preferences. Ultimately, this benefits all customers – those who prefer to use a staffed checkout but also those who like to scan and pay for their purchases themselves and retain control over the timing and pace of their shopping experience.

In future, not only checkout but also customer advice and shelf-stacking may be increasingly automated: major advances in artificial intelligence mean that machines can already answer customers' questions and recognise and restock empty shelves.

The transport sector also now operates similar systems. At Swiss airports, the check-in process is mostly completed online rather than at a service desk. For example, around 60 per cent of all passengers travelling with SWISS already use online systems to check in at Zurich airport.[12]

Automating the check-in process enables more passengers to be processed without making demands on tight available space. Waiting times have also come down, which ultimately benefits passengers. Passengers also benefit from greater transparency and supervision. There are plans to make the baggage drop process largely automated, too, with pilot schemes already running in Switzerland.

"Automation has enabled us to maintain and improve product quality. For example, we have been able to process higher volumes and cut check-in times Automation also adds value for customers, giving them greater control and transparency. Our customers appreciate automation and want more of it."

Achim Schneider
Head of Ground Services Development, Swiss International Air Lines

"New technologies such as artificial intelligence offer the retail sector huge potential in areas like customer advice or online shopping. Migros is following these trends with great interest."

Martin Haas
CIO Migros

Alongside sales, logistics also offers potential for automation. Software programs can already manage the storage and distribution of goods. For example, Amazon's distribution centres use algorithms to guide pickers to the right shelf via the shortest route, while packing and despatch are also completely automated. Amazon now plans to have robots actually picking goods from the shelves. In technical terms, however, this is a far from simple process: the robots have to be able to recognise and select goods of differing sizes and weights, requiring them to be capable of a range of movements and great flexibility.

Ultimately, distribution and transport of goods could be revolutionised by automation if drones and driverless vehicles were to become routine. This would mean considerably fewer jobs for drivers, but this kind of technology would create jobs for technicians to maintain and ensure the safety of the robots.

In contrast, there is less potential for automating the jobs of around 240,000 employees in the wholesale and retail trade, transportation and storage industry, including 32,000 managers and directors (14 per cent likelihood of automation) and 15,000 managers in sales and marketing (25 per cent likelihood). The increasing automation of roles in sales, warehousing and distribution may mean that the proportion of jobs with a medium to high likelihood of being automated falls, that those affected will move into new areas or that new jobs will be created to maintain and repair the new technology and to evaluate the data it collects.

"Over recent years, Clariant has introduced a uniform electronic solution for procurement of indirect goods. Linking this with rigorous project management means that we've been able to automate about 65% of all our transactions."

Oliver Ringenbach
Global Process and Automation Manager Clariant

Manufacturing

Manufacturing (including life sciences) currently faces a number of challenges. These include the strong Swiss Franc, economic volatility, intensifying global competition, new competition from emerging economies, geopolitical risks, and a skills shortage. Against this backdrop, the following six specific growth strategies are gaining in importance:

1. Driving customer involvement
2. Going global
3. Developing new services
4. Innovating beyond product level
5. Growing inorganically
6. Leveraging operational excellence

Automation can play a key role in supporting companies in exploiting these six growth strategies, for example through:

- introducing globally networked and cloud-based customer relationship management systems
- developing new geographical markets, using integrated planning systems to coordinate them efficiently
- developing new services based on automated evaluation of machine data
- developing automated marketing channels (app-based, for example) that can make it profitable to service small as well as larger markets
- using software robots to produce financial statements efficiently, requiring the compilation of data from differing ERP systems (for example, those within newly acquired companies)
- using industry 4.0 technologies to make production processes more flexible and to tailor them to customers' individual needs.

Individual occupations within manufacturing also demonstrate some of the highest potential for automation. Almost half of all employees in the industry are in occupations with a high likelihood of automation. These include goods production, such as metalworking and allied occupations (20,000 employees; 77 per cent likelihood of automation), elementary occupations (35,000; 80 per cent likelihood), and furniture makers (20,000 employees; 92 per cent likelihood), but also a range of service occupations, including general clerical occupations (31,000 employees; 97 per cent likelihood) and sales staff and sales assistants (13,000 employees; 95 per cent likelihood).

However, 32 per cent of all employees in manufacturing are at low risk of seeing their jobs automated. This group includes managers in a number of differing areas, such as sales and marketing (10,000 employees; 25 per cent likelihood of automation) and production managers in goods production (14,000 employees; 2 per cent likelihood).

Technological innovations over recent decades, such as industrial robots and 3D printers, have made manufacturing one of the most heavily automated sectors. This trend has been even more marked in Switzerland over the past few years as a result of the rise in value of the Swiss Franc. In a Deloitte survey of 400 companies in the Swiss MEM sector, 70 per cent of those surveyed said that they had increased automation and stepped up measures to boost efficiency as a response to the strong Swiss Franc.[13]

It is likely that increasing automation will produce higher skills levels among those working in the manufacturing industry over the coming years. The more new and complex machinery is used in the production process, the higher the demands on the employees who operate and maintain such machinery.

"Maxon Motor has had a very good experience of 3D printers. We no longer have to wait weeks for the first prototypes – we get them within hours, so we can immediately see whether the product actually works."

Eugen Elmiger
CEO Maxon Motor

Box: Automation across the manufacturing value chain

There is potential for automation right across the value chain in the manufacturing industry. This is most clearly illustrated by the Supply Chain Operations Reference (SCOR) model, which was developed by the APICS Supply Chain Council with the aim of boosting the efficiency of its members' value chains.[14] The model describes the process of creating value from supplier to customer and breaks it down into six stages.

At each of these stages, new technology offers scope for automating processes and thereby boosting productivity. The key factor in relation to improvements in productivity is that the differing automation solutions at each individual stage in the value chain can be linked to form an over-arching system.

Figure 7. Potential for automation across the value chain

	Description of SCOR stages	Examples of innovation across the value chain
Plan	Stage 1 involves balancing supply and capacity with aggregated demand to establish needs and develop activities.	**Integrated business planning** Automated sales and operation planning enables stock and capacity to be matched more efficiently to aggregated demand, enabling requirements and activities to be tailored.
Source	Stage 2 describes the procurement of the primary or intermediate products required to produce the company's goods or services.	**Digital procurement** Simplified electronic end-to-end solutions in procurement (e.g. paperless ordering and invoicing) bring down the cost of administration and optimise time management. Networking with suppliers and partners is crucial to improvements in productivity, so that all those involved have access to processes and the system.

	Description of SCOR stages	Examples of innovation across the value chain
 Make	Stage 3 involves producing finished products that can be sold to customers.	**3D printers** 3D printers are increasingly important in the production of goods. Although 3D printers are still used primarily to produce prototypes in many sectors, the technology is advancing rapidly and is likely to be rolled out for individualised mass production in the near future.
 Deliver	Stage 4 typically focuses on the distribution and transport management involved in delivering finished goods and services to customers.	**Drones and driverless vehicles** Drones and driverless vehicles are already automating large parts of distribution and transport management. However, regulation and unclear liabilty often hamper greater use of this technology.
 Return	Stage 5 deals with the return of defective goods following delivery; this may include returning goods to the supply chain.	**Cognitive technologies** Major advances in cognitive technologies mean that the return of goods is already largely automated. Software can recognise defective products at an early stage and automatically initiate replacement.
 Enable	Stage 6 involves processes that support other processes, such as business rules, compliance and performance management.	**Software robots** Support processes (e.g. finance and HR) are already increasingly handled by software robots. This process is currently focused on repetitive and easily structured processes, but the development of cognitive technologies (artificial intelligence) is already advanced, so these technologies are likely to be rolled out more widely in the near future.

Box: Automation in life sciences

Life sciences companies in Switzerland have been increasingly automating their manufacturing in the last ten years. The impact of automation on life sciences companies is deeply transformative and affects not only the way products are produced and delivered but the business models and customer value generation as a whole. Automation plays a central role in delivering the most impactful customer and industry trends such as the higher number of more differentiated, individualised products as well as packaging and artwork. To deliver this, the integration of equipment and systems as well as automation technology are of central importance. The long-term vision is automated continuous manufacturing from the raw input chemicals to the finalised drug in smaller batch sizes (goal 0 – total individualisation).

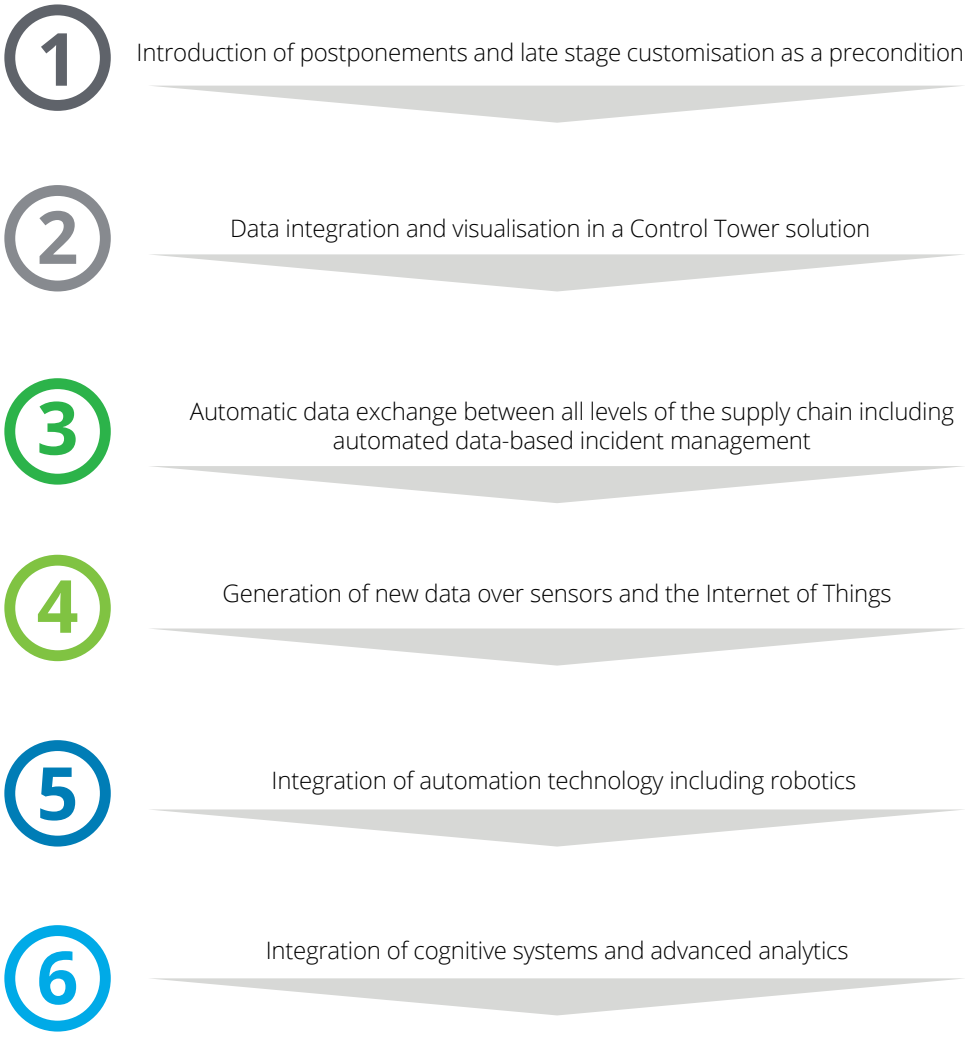
Jobs that involve bridging production islands and gaps in production and performing manual handovers will gradually disappear. This concerns the transfer of data, the changeover and cleaning of machinery as well as manual tasks in packaging and production.

Jobs in R&D and testing are safe and might potentially even increase due to automation. The growing number of products and product variations will also require a higher number of employees in R&D and testing.

The life sciences industry will move away from mass markets with standardised products protected by patents. The new market and product structure will require a higher number of employees in design, marketing and sales.

One specific example of automation in life sciences is packaging automation, including the design and printing of artworks. This is done in several key steps as highlighted in Figure 8.

Figure 8. Stages of automation in packaging



Overall, the benefits of automation in life sciences include the reduction of lead times, increasing overall equipment effectiveness (OEE), lower manufacturing costs, increased safety and compliance with regulation, increased product quality and patient adherence due to unit dose production, and source potential competitive edge due to individual product and packaging composition and design. Another benefit in terms of data processing is increased R&D quality due to better data flow from patients and doctors to the research departments.

Financial and insurance services

The pressure to automate reached the financial services industry later than other sectors but is now impacting more and more on both the revenues and costs of service providers. This is the result of a range of factors, including[15]:

- greater and more complex regulation
- globalisation, with new customer needs, convergence between markets and new international competitors
- digitalisation, with new customer expectations, new technologies, new opportunities and new competitors from outside the industry (fintechs)
- transition to a buyer's market and increasing commodification of core services within the financial services industry, such as customer advice
- demographic change, with new customer profiles in the area of pension provision but also younger generations with different expectations of financial service providers and technology applications (generation Y and millennials)
- a demanding economic and business environment, with low or negative rates of interest, volatile exchange rates and, in many parts of the world, weaker economic growth than before the financial crisis.

These trends are producing far-reaching change in the financial services industry, including greater automation. The Deloitte study "Industrialisation in banking. Unlocking the efficiency and agility of the Swiss banking industry" indicates that Swiss banks are planning to increase their level of industrialisation substantially over the next five years, relying heavily on further automation, process digitalisation and robotics.[16]

Overall, jobs in the financial services sector are relatively unlikely to be automated (see Figure 3 and 4), with just under one-third rated as having a high likelihood of being automated and slightly more than one-third rated as having a medium and a low likelihood respectively of being automated. However, this relatively modest average profile conceals marked differences between roles and functions (see Figure 9).

From the customer's perspective, the individual functions of a bank can be divided into five main categories, plus Insurance and Cross-functional (see also the Deloitte study "Swiss banking business models of the future Embarking to new horizons"). These main categories are:

- Payments
- Savings and loans
- Asset management
- Market provisioning
- Capital procurement
- Insurance
- Cross-functional

In the financial services sector, it is also crucial to distinguish between roles that involve direct customer contact and those that do not (front-office roles as opposed to back-office roles). As in other sectors, direct customer contact in the financial sector frequently means roles are less likely to be automated. However, both front-office and back-office roles may have a high likelihood of being automated. For example, customer-facing counter clerks (front-office roles) have a 97 per cent likelihood of seeing their jobs automated, the same percentage as statisticians, who are not customer-facing (see Figure 9).

Figure 9. Likelihood of automation of roles in the financial services sector by function

	Direct customer contact for each function	*Typical activities and automation likelihood rating*		
Payments	👤	Software developer (8%)	Counter clerk (97%)	Data entry operators (99%)
Savings and loans	👤👤	Financial/investment adviser (41%)	Loan analyst (51%)	Counter clerk (97%)
Asset managment	👤👤👤	Securities trader (5%)*	Graduate marketing expert (16%)	Financial/investment adviser (41%)
Market provisioning	👤	Software developer (8%)	Financial analyst (25%)	Statistician (97%)
Capital procurement	👤👤	Graduate financial specialist (25%)	Economist (25%)	Financial specialist(51%)
Insurance	👤👤	Actuary (15%)	Insurance specialist (39%)	Insurance representative (66%)
Cross-functional	👤	Organisational analyst (7%)	Software developer (8%)	Accountancy specialist (97%)

How to use the examples: The 'Payments' function has low levels of direct customer contact; a typical activity in this area is counter clerk, which has an automation likelihood rating of 97%.

Legend:

Proportion of direct customer contact per function

👤 Low 👤👤 Medium 👤👤👤 High ⬚ Sample activity with lowest automation likelihood rating ⬚ Sample activity with highest automation likelihood rating

**** For more complex transactions/institutional business***

The driving force here is innovations that are substantially increasing automation not only of back-office processes but also regarding customer interface. This produces marked differences in the impact of automation on individual functions. Figure 10 shows which key innovations impact on individual functions and which change the customer interface.

Figure 10. Key automation innovations by financial function

	Innovation (examples)		
Payments	**Online/mobile payments** Payments are increasingly made not on paper and/or in branch but online or via mobile devices. Some are made in digital currencies. Mobile transactions are increasingly competing with card transactions and may circumvent banks.	**New payment standards** Payments are becoming more and more standardised, both internationally (e.g. through SEPA) and in Switzerland (through ISO 20022). This enables transations to be handled more rapidly and automatically. Blockchain or P2P transfer networks in general enable direct payments to be made.	**Streamlined payment processes** Machine-to-machine payments or integrated billing processes (e.g. within an app) streamline payment processes, reducing the cost of handling payments.
Savings and loans	**Digital banking** Bank services are increasingly being digitalised through online banking, mobile banking or virtual branches. Advice services can be provided through 'live chat' functions or video calls. The use of virtual advisers in physical branches is also being piloted.	**Online onboarding** Technology-neutral regulation of customer identification enables online onboarding, removing the last necessary point of personal contact. Account opening is speeded up, and there are lower costs and fewer obstacles when customers switch providers.	**Automated credit rating** Credit rating can be further automated and carried out more rapidly and transparently. Automated credit rating can also be adapted to reflect a range of criteria, such as behavioural data relating to applicants.
Asset management	**Automated advice, roboadvisers** Automated advisers enable portfolio allocations to be made at lower cost and with greater breadth and depth than using solely human advisers. Automated background processes also enable advisers to focus more on clients.	**Advanced analytics** Advanced algorithms and analytical models increase the sophistication of services available.	**Digital platforms** Digital platforms enable individual investors to share investment strateies with others or to develop them on a joint basis (e.g. through social trading and videos). They can also be involved in algorithmic trading despite having limited infrastructure and knowledge.
Market provisioning	**Artificial intelligence / machine learning** Artificial intelligence that learns means more intelligent solutions and improves the quality of automatic actions without human intervention.	**Machine-usable, cross-platform and standardised data** Machines use algorithms to process data without human intervention. Standardised data increase market transparency and bring down switching costs for customers.	**Automated data gathering and evaluation / big data** Automatic data gathering and evaluation supports decision-making. Evaluating extensive data sets (big data) offers new market insights and options.

	Innovation (examples)		
Capital procurement	**Crowd funding** Crowd funding enables companies to raise capital from individual investors by means of digital platforms, This widens the scope for capital procurement, especially for start-ups or for direct project financing for small businesses.	**Individual business financing** Digital platforms offer companies a wide range of parameters for tailor-made financing options. A range of financial models are also available, such as interest-free purchaser pre-funding of a product.	**Individual investment opportunities** Digital platforms offer investors wide-ranging investment opportunities for direct individual or joint investment. They also offer scope for skilled investors to share their expertise in return for higher returns.
Insurance	**Selection and assessment of risk** On the basis of data collected, rule-based algorithms can be created and used to select and assess insurance risks.	**Automated document compilation** Once a contract has been concluded, policy documentation and invoices can be compiled using individualised data and sent to the policy holder.	**Automated claims settlement** A higher level of automation in the assessment of the accuracy of invoices to be issued and direct payment of sums below a defined materiality threshold.
Cross-functional	**Digital workplace / flexible workplace models** More efficient design and organisation of the workplace and more efficient use of office space through greater use and networking of technology and more flexible workplace models, such as home-office or co-working space models.	**Robotics (robotic process automation)** The use of specialised software to automate repetitive, rule-based processes, increasing efficiency, scalability and productivity and substantially reducing costs.	**Blockchain** Blockchain is a database technology that can achieve far-reaching change in any sector in which multiple parties must be able to rely on a database. It offers banks new scope for vertical integration, cost-cutting and standardisation.

Including innovations in customer interface

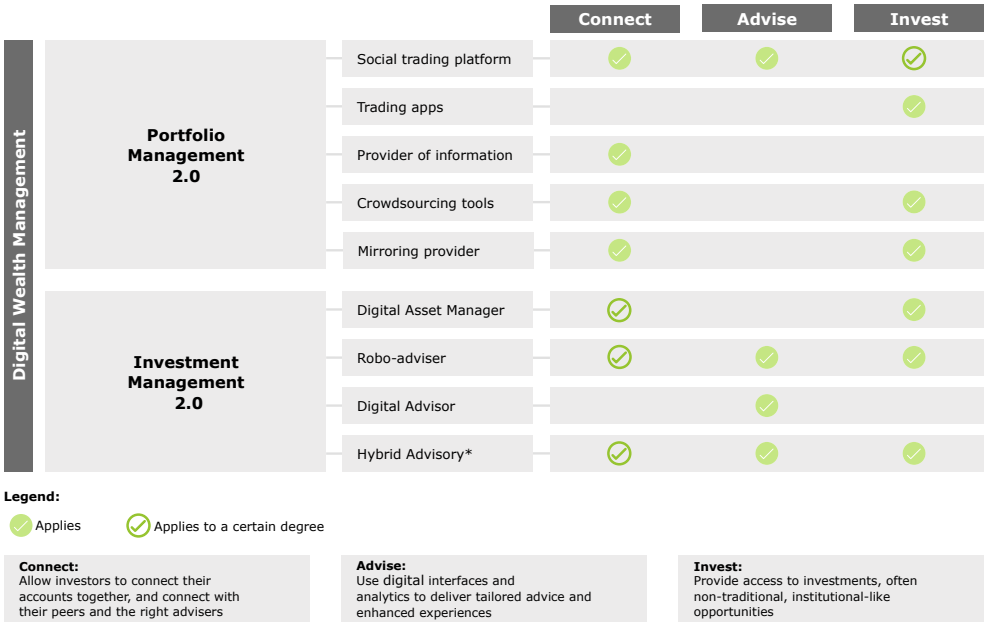
No significant innovations in customer interface

Two of the most advanced trends here are automated advice provision and robotics (robotic process automation, or RPA).

Case study of automated customer interface: Digital asset management

Automated advice means lower-cost portfolio allocations along with greater depth and breadth of service than is possible with purely face-to-face advice. The higher quality of advice extends particularly to small investments because costs are lower, enabling new customer segments to be developed. There are various models for automated advice and asset management, and from a customer perspective, service can be broken down into three core areas: connection, advising and investing (see Figure 11).

Figure 11. Digital asset management



* Combination of Robo Advisers with personal advice

As well as user-generated investment strategies (social trading) and wholly automated investment processes, there are also hybrid models that include elements of face-to-face advice. For example, highly trained and skilled financial advisers can create value for their clients and offer them tailored recommendations particularly where decisions are more complex or involve higher-value transactions. Robo-advisers facilitate this process by generating a broad initial investment concept that can subsequently be refined by the financial adviser.

For some clients, costs can be reduced and the efficiency of background processes improved by automating administrative procedures, such as suitability checks on investment products. This frees up advisers and allows them to concentrate on their advisory role.

"Our online provision is now more standardised, more efficient and more scalable. The substantial economies of scale we have achieved have enabled us massively to increase our volumes without any loss of quality or increase in costs."

Ivan Büchi
Head of Digital Office Glarner Kantonalbank

Case study of automated back-office processes: Robotics

The same is true of other back-office processes, such as compiling performance or management reports. One way of achieving this lies in the use of software known as robotic process automation (RPA). Repetitive, rule-based processes that are vulnerable to human error are automated using software that surveys and interprets existing IT systems. This is a promising approach, in particular in the financial services sector, because the automation of background processes is often at a very early stage, not least as a result of complex and older core IT systems, but also because background processes are not among financial service providers' core services. More extensive automation would enable greater cost savings while also improving flexibility, productivity, scalability and quality. Figure 12 illustrates a selection of promising process candidates for RPA in the financial services sector. (For further discussion of the use of robotics, see Section 4 and the Deloitte study "Next generation automation").[17]

Figure 12. Selection of process candidates for RPA in the financial services sector

Infrastructure
- Asset reporting and general reporting
- Reconciliation
- Security and network management
- Financial and risk processes
- Procurement
- HR process management
- Investment project management
- Compliance
- IT management
- Decision-making support
- Support services
- Business planning and transaction
- Risk management

Operations
- Customer onboarding
- Customer service management
- Product and service delivery
- Product and service sales
- Product and service development

The impact of automation in the financial services sector

As consumer information improves, the financial services sector is following other sectors in increasingly becoming a buyers' market. Simple bank transactions, investment decisions or insurance contracts are now available online without customers needing advice from their bank. However, when transactions become more complex or involve larger sums, there is still a need for advice, for example when clients are starting a family, buying property, taking out a pension, or for private banking.

While there are more and more opportunities for automation, here too, automation tends to be complementary when more complex translations are involved. For example, automated systems can offer better service in areas such as small investments that previously barely covered their costs, if at all. Moreover, particularly in the case of complex and large-scale bank transactions, quality of service is improved, by having face-to-face advice and technological support working side by side.

Activities may well increasingly move in the direction of high-quality, technology-supported advice, while simpler transactions are more and more likely to be automated. One area in which this is particularly true is payments, where the focus is on cutting costs. It is in banks' interests to reduce the number of special cases to a minimum and drive further automation, not only on grounds of cost but also to speed up processing.

New jobs are also being created in areas that are open to automation. If banks are to be able to optimise processes and use automated software, they will continue to need their experienced staff's in-depth knowledge of these processes to complement the use of automated processes. However, the skills profile of employees may change and new roles may well lie outside traditional banking and insurance because of structural change and the fragmentation of value chains. These new roles may, in fact, be just as likely to be created by specialised providers or fintech companies. Figure 13 shows the impact automation could impact on individual financial functions.

Our online strategy and digital provision have created new job profiles. Overall, rather than cutting jobs, we have actually increased staffing, not least because our expectations for volumes have been massively exceeded."

Marcel Stauch
Head of Department Online Sales and Transactions Glarner Kantonalbank

"Automation offers Swiss banks the opportunity to become more efficient and improve the client experience. It enables them to establish new channels and tap into new client segments, thereby generating growth."

Stephan Hug
Head IT Strategy & Architecture Credit Suisse

Figure 13. Impact of automation by financial function

	Impact of automation	*Complementary effect*
Payments	• New digital payment forms without a human interface, such as payment apps • Further automation of background payment transactions; further reduction of special cases requiring human input to save costs • Specalist human input reserved for problem cases, development of new processes/forms of payment and process optimisation.	
Savings and loans	• Online/mobile banking, virtual bank branches, online onboarding, online loans and alternative credit rating systems reduce the need for human intervention but also mean that services can be better tailored to customers • More employees are available to advise customers on more complex business, such as starting a family, pensions or buying property • Specialists will continue to be needed for problem cases, development and process optimisation.	
Asset management	• Automating advisory services, cost-cutting and tapping into new market segments • Automating background processes, suh as onboarding and reporting • Freeing up customer advisers to focus on providing high-quality advice (hybrid model, digital advice).	
Market provisioning	• More intelligent and faster machines and new (social) market platforms are increasingly automating information gathering, dissemination and processing and increasing connectivity between market participants • Markets are more efficient, more liquid and more accessible, and banks are able to open up new market segments, while new customers are able to participate in the market and existing customers are able to expand their involvement or become involved in new types of business.	
Capital procurement	• New digital opportunities for capital procurement (crowd funding) are more automated and reduce the need for banks to help with capital procurement • These systems also represent attractive investment opportunities for banks and enable them to tap into new market segments (such as start-up funding), while more complex and larger transactions continue to benefit from specialist input • Specialists will also continue to be needed for problem cases, development and process optimisation.	
Insurance	• Automated scanning and documentation solutions and straight-through data processing mean that data can be integrated rapidly and to a high standard, avoiding the need to input data into multiple different IT systems and enabling administrative staff to focus on other roles within the value creation process • Automated assessment of claims may substantially reduce the human involvement in claims settlement, freeing up assessors to focus on complex claims • Automated processes link data from differing sources and enable customers and customer advisors to access and process insurance data in real time • Straight-through data processing avoids the need to input data more than once into different IT systems, saving time and improving data quality	
Cross-functional	• New digital tools and more efficient organisation of the workplace boost employee productivity and have a complementary effect • RPA enables simple processes to be automated, with the loss of jobs in these areas compensated for by new jobs focusing on problem cases, development and process optimisation • Blockchain technology also enables roles to be automated and savings to be made, releasing capacity for higher quality services.	

The greater the complementary efffect – that is, the complementary use of technology to increase efficiency, to tap into new markets and to increase growth – the better the prospects for employment as automation advances. For a more detailed explanation of the differing impact of automation, see page 4.

Automation enables suppliers to focus more closely on their core business. This improves the quality of the service they offer and enables them to tap into new market segments, for example by cost-effectively managing customers below the business value threshold for private banking. It also enables businesses to access new growth areas, with the result that overall, the complementary effects are likely to outweigh the substitution effects and that, despite the investment needed to bring financial services up to the required level of automation, new jobs will be created.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How can companies benefit from automation?

Rapid advances in technology represent potential but also challenges and risks for companies. There are many opportunities to implement automation. One major area with recent acceleration is process automation. This is of particular relevance for service sectors such as financial services, but also for back-office functions of all sectors. Businesses have a basic choice between two types of automation:

- **Robot-based process automation,** which can take over repetitive and structured human activities (for example, transferring addresses from the Web to an Excel spreadsheet). A robot can take over an entire process from start to finish without requiring repeated human intervention.
- **Intelligent automation/cognitive technology,** which carries out unstructured activities and non-standardised processes, and demonstrates human-like abilities (for example, speech recognition, enabling recognition of customer identities).

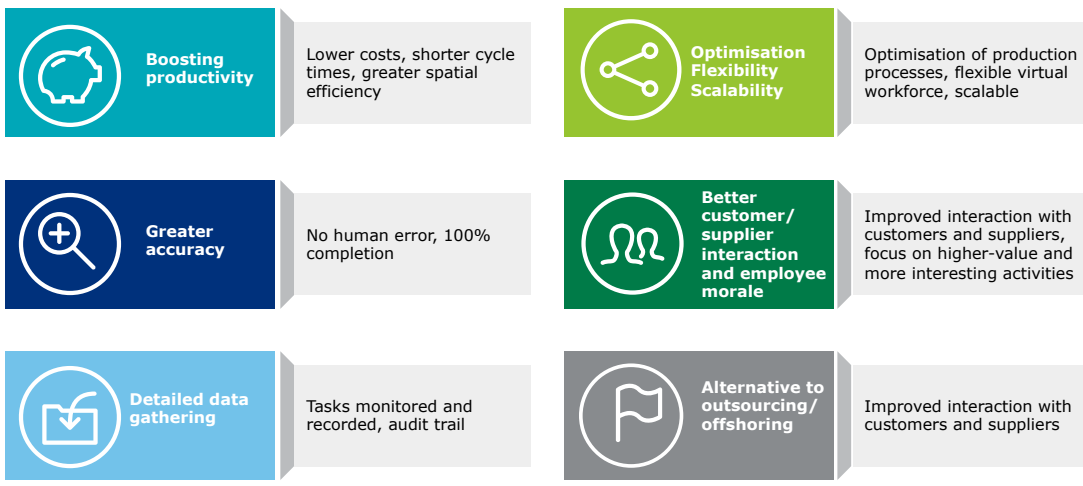
"Automating the procurement of indirect goods has cut our spending on administration and optimised our time management. Our staff have also been able to improve the quality of their internal services."

Oliver Ringenbach
Global Process and Automation Manager Clariant

The advantages of automation

Ongoing automation offers companies many different advantages (see Figure 14). Automation makes it easier to optimise and scale production processes, cut costs, increase accuracy and productivity (in particular as a result of man/machine collaboration), reduce land use, and improve interaction with customers and suppliers. It also represents an alternative to outsourcing and offshoring, offering Swiss industry an attractive opportunity to keep employment, revenues and value creation onshore and increase them.

Figure 14. Advantages of automation from a company perspective



Developing an overall strategy

An overall strategy is needed to make use of these advantages (see also Figure 15).

- Based on the advantages of automation set out above, the first step towards devising such a strategy should be to define the key goals. What exactly does the organisation want to achieve: reduction in land use, better quality, cost savings or other goals?
- Step two involves assessing how automation can help achieve these goals. While automation is one way, depending on the situation other solutions may also be involved, such as standardisation, simplification or outsourcing (see Figure 16). The priority here is to identify the processes that are most suitable for automation with a view to achieving the previously defined goals. Questions to be asked include: how can these processes identified, which automation technologies are most appropriate and what are the key indicators?
- Once goals have been defined and processes identified, the next step involves the approach to be taken. Phased implementation offers advantages, as it increases the likelihood of a successful process of change. It is also advisable to begin with a pilot project, including identification of the individuals responsible: who will manage and oversee the process of automation?
- Finally, step four should define the timescale, establishing how long the pilot project should run and what steps should follow. This will produce a master plan that sets out the timescale and supports implementation of the business model.

Figure 15. Schematic automation strategy

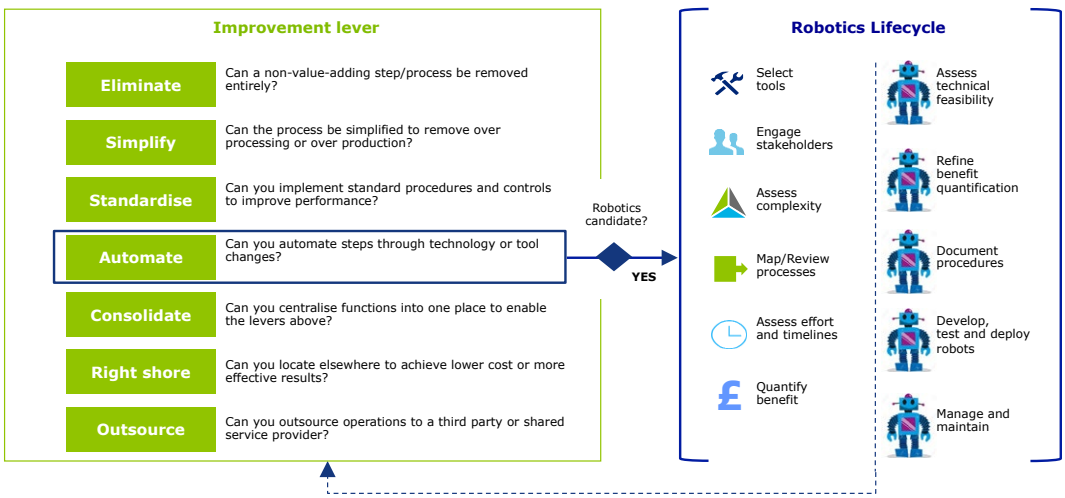
"Systems technology is becoming increasingly important. More and more of our partners are interested in the automated overall system and fewer in individual automation technologies."

Prof. Roland Anderegg
University of Applied Sciences and Arts Northwestern Switzerland
Institute of Automation

From strategy to implementation

The first question to be answered when an automation strategy is being implemented is to clarify the relationship between this strategy and the company's over-arching improvement strategy. Automation is one way of improving a company's operation, but depending on the situation others may also have a part to play, including standardisation, simplification and outsourcing (see Figure 16).

Figure 16. Automation as part of an over-arching optimisation strategy

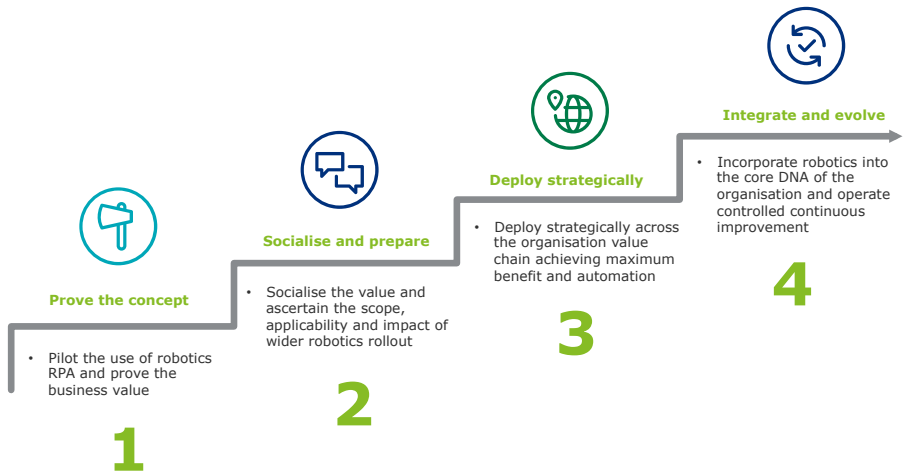


Consideration also needs to be given to the question of how automation fits with process optimisation. Ideally, to achieve maximum efficiency gains, create a sustainable long-term solution for the company and optimise automation: processes should first be optimised and then automated. However, there is a risk with this model that the company is too ambitious: rather than simply seeing through a process of automation, it has to instigate and implement a comprehensive change process, with the risk that this process will remain partial or incomplete. The alternative – automation of existing processes – enables the gains from automation to be achieved more rapidly. Implementation of automation is staged, increasing the probability of a successful process of change. Efficiency gains resulting from process optimisation must, however, also be achieved sequentially, with the automation solution being tailored to these stages. Optimisation of an automated process is usually completed more rapidly than optimisation of a manual process, because there is no need to build in training and familiarisation time.

The procedure a company should ideally choose depends on the maturity of the process in question, the timescale and the cost of the differing options for implementation in each individual case. Existing internal support also plays a part. Defective processes should never be automated, but suboptimal processes may be suitable for automation in individual cases.

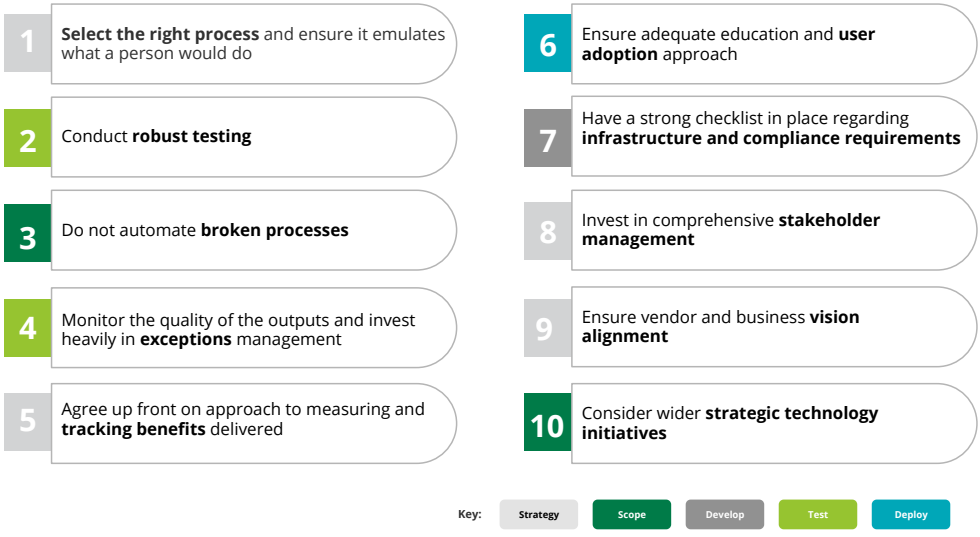
A multi-stage adoption process is the best way of implementing an automation strategy in both gradual and comprehensive processes, in particular. This process aims to secure the successful adoption of new technology within the company, as Figure 17 illustrates.

Figure 17. Stages in a successful adoption of automation



After successful evaluation of the automation model, including through pilot schemes, internal stakeholders have to be convinced. The process also needs to be strategically managed and ultimately embedded in the company's core functions and then improved on an ongoing basis. Figure 18 illustrates the factors to be considered – and the pitfalls to be avoided.

Figure 18. Criteria for successfully implementing an automation strategy



The risks of automation

It is also important to bear in mind that as corporate processes become increasingly automated, the nature of the risks associated with automation also changes. Compared to human input, using machines and software carries different risks, in particular greater cyber risks. On the one hand, robots are less prone to error than human employees and less vulnerable to factors such as phishing emails, data protection, breaches of compliance or wilful damage to the company. On the other hand, however, robots and machine-controlled software are as vulnerable as any other software to risks such as viruses, malware, data manipulation and weaknesses in authorisation management. Manipulated software can do substantial damage to a business. These risks can be limited by taking counter-measures, but such measures need to be factored in at the design stage.

Nevertheless, with an effective strategy to manage cyber risks in place, the security advantages of automation outweigh the disadvantages (see Figure 19).

Figure 19. Cyber risks

Advantages

- Robots can reduce privacy risks
  - reduced number of staff with access to data can reduce legal compliance concerns
  - ability to quickly implement robots in any geography by moving the virtual machine
  - no 'local copies' of data stored by individuals trying to shortcut their workload means data does not get unintentionally distributed.

Risks

- Robots increase the attack surface for a malicious actor
  - robot becomes another piece of software with potential vulnerabilities (e.g. cached credentials)
  - attacks can happen directly or by manipulating the data processed
- manipulation of robots represents an opportunity for long-term harm, e.g. reprogrammed to function as malicious software rather than installing detectable malware.

Each of these risks can be mitigated; they do, however, need to be considered during planning and implementation.

Endnotes

[1]Deloitte (2016): The workplace of the future. How digital technology and the sharing economy are changing the Swiss workforce.

[2]Ford, Martin (2009): The Lights in the Tunnel.

[3]Frey, Carl Benedikt and Michael A. Osborne (2013): The Future of Employment: How Susceptible Are Jobs to Computerisation?

[4]Deloitte (2015): Man and machine: robots on the rise? The impact of automation on the Swiss labour market;

[5]Autor, David (2015): Why Are There Still So Many Jobs? The History and Future of Workplace Automation.

[6]Gregory, Terry, Salomons, Anna and Ulrich Zierahn (2016): Racing with or against the machine? Evidence from Europe. Discussion Paper ZEW.

[7]Deloitte (2015): Man and machine: robots on the rise? The impact of automation on the Swiss labour market.

[8]Deloitte (2016): Structural change creates jobs. How automation will impact employment in Switzerland.

[9]IFR Statistical Department (2016): World Robotics Survey 2015.

[10]The proportion of employees in public administration and health and social services with a high skill level (ISCO level 1 and 2) is 44%. This is the highest level of any industry except ICT (66%).

[11]Handel Schweiz (Swiss Trade) (2015): Handel 4.0 erfordert Investitionen von CHF 4 Mrd. in fünf Jahren [Commerce 4.0 requires investment of CHF 4 billion over five years.]. Press release.

[12]NZZ (2015): Rollentausch an der Kasse. 30.4.2015.

[13]Deloitte and BAKBASEL (2015): Growth opportunities. Strategies for Swiss companies.

[14]APICS Supply Chain Council: http://www.apics.org/sites/apics-supply-chain-council/frameworks/scor.

[15]For an overview of the major trends and innovations in the banking sector and how they impact on the business models of banks, see Deloitte (2016): Swiss banking business models of the future. Embarking to new horizons.

[16]Deloitte (2016): Industrialisation in banking. Unlocking the efficiency and agility of the Swiss banking industry.

[17]For further details of RPA, see Deloitte (2016): Next generation automation. Transform your business with robotics and intelligent automation.

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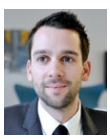

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Special thanks to: Etienne Auger and Robert Schroeder.

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