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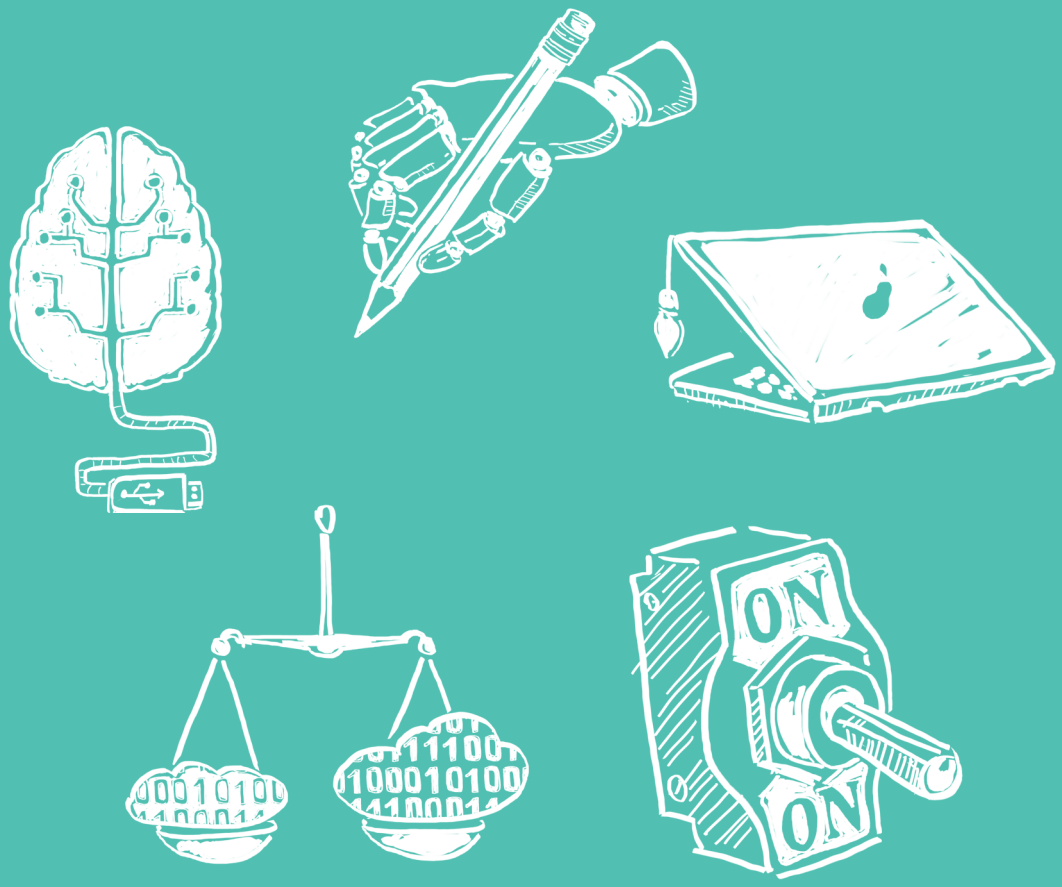
IAP
Institute of Applied
Psychology

IAP Study 2017 – Part 2

Human Factors and the Future of Work

Results of the Qualitative Interviews



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Further information
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The personalised interviews profiled in this study are excerpts from the respective full interviews.

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1. Human Factors and the Future of Work – Basics of the Qualitative Study

The modern working world is affected by fundamental, technology-induced transformation processes. Those sectors particularly affected are the industrial sector, the manufacturing industry, mechanical engineering, as well as parts of the service sector. The linking of the internet with the physical world has facilitated the emergence of new products, services and processes.

These changes alter our notions of work and people's roles within the work process. We are talking about the 4th Industrial Revolution. In this development, different scenarios are outlined regarding the importance of humans in human-machine interactions. On the one hand, experts see digitalisation as a window of opportunity for professionals, where their knowledge can be used or further developed (see Buhr, 2015; Windelband & Spötl, 2012). Others, however, predict a reduction of professionals' creative freedoms and a devaluation of their expertise, due to increasingly intelligent, self-guiding equipment and machinery. A third theory, the so-called hybrid scenario, is based on the emergence of new forms of interaction between man and machine, thus leading to considerations regarding the new requirements that professionals face. The range of estimates and predictions about digital structural changes at hand underline the prevailing uncertainty about its impact on labour and employment.

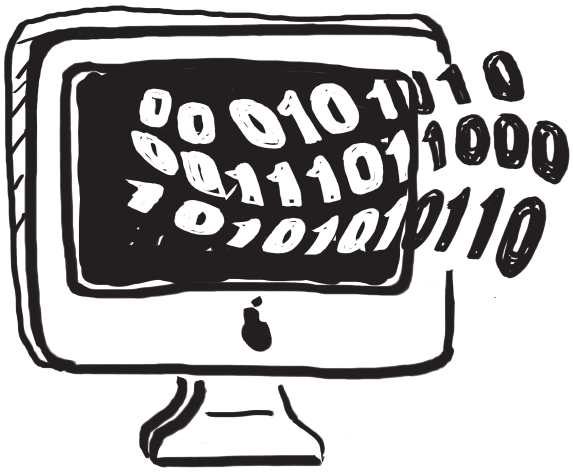
So far, the issue of how particular professional groups evaluate digitalisation, professionally and personally, has been sparsely discussed in science and practice. So too have the recommendations, which exist to ensure that the predicted positive influences of digital technology actually occur.

The present IAP Study has taken up this focus. The primary aim of the study was to conduct structured interviews with 23 professionals from different industries and companies in Switzerland, with a particular focus on large companies. These individuals were questioned concerning their assessment of digital structural change (in relation to their own function and the company as a whole). The professionals interviewed encompassed a range of job descriptions/function groups: leadership, HR management, training / L&D management and technology management.

The interview was divided into blocks of questions that 1) addressed all function groups equally and 2) were surveyed specifically to each function. All interviews were processed according to scientific standards of qualitative data analysis.[1]

1 Detailed information on the scientific approach will be provided at request.

2. Digital Transformation



In current discussions on the application and development potential of information technologies, it is assumed that a pronounced developmental advance is currently taking place. New potential uses for social and economic purposes are being defined which, from a critical viewpoint, do involve a certain level of «hype». For obvious reasons, critical voices ask whether the widely discussed «Fourth Industrial Revolution» is not simply «old wine in new bottles» (e.g. Jasperneite, 2012). In fact, it is often pointed out in the literature that digitalisation, as such, does not exist (e.g., Passignano & Scholz, 2015). From the 1960s onwards, the digitalisation of essential calculation processes started taking place in the financial industry. From the 1970s onward hospitals, amongst other institutions started using digital databases. Back then, the concept of automation was paramount. Only since the 1990s has the term digitalisation been used more commonly and according to its present vague meaning (Passignano & Scholz, 2015).

Other authors and experts, however, speak of the digital transformation's uniqueness and with it the associated technological advancement (see Hirsch-Kreinsen & ten Hompel, 2017). The development of digital technologies has reached a stage, in which new possibilities for their application are opened up. The uncertainty of the structural consequences of digitalisation, as well as the increasing potential for digital applications are not comparable to recent decades. Modern automation and digitalisation technologies have led to increasingly close-knit communication and cooperation between employees, equipment, logistics, products and customers (Hammermann & Stettes, 2016). Increasingly, it is not just workers who are linked through smartphones, tablets, and laptops - machinery and equipment now also communicate with each other (i.e. the «Internet of Things»). The linking of all available information introduces new possibilities for global and economic use. The term «big data» summarises the collection, evaluation, and targeted use of large data sets.

Given digitalisation's different connotations in science and practice, we first presented the interviewees with the very heterogeneous results relating to the understanding of the termin digitalisation from our previous survey. The subjects were asked to what extent these results conformed their understanding, and which definition of digitalisation stood at the foreground of their daily work. The following word clouds reflect the listed answers, separated by function.

Figure 1: Executive staff's understanding of digitalisation

The interviewed executives particularly associated the term «digitalisation» with increase in speed, big data, paperless forms of work, industry 4.0 and mobile and flexible work.

Figure 2: HR managers' understanding of digitalisation

The surveyed HR managers particularly associate acceleration, digital recruiting, paperless work, and social media in connection with digitalisation.

Figure 3: L&D managers' understanding of digitalisation

The function group consisting of leaders in training and/or staff development highlighted digital work processes, mobile and flexible work solutions, digital learning, and increase in speed.

Figure 4: Technology experts' understanding of digitalisation

The function group of technology experts described digitalisation mainly as digital work processes, development of new business models, digital customer orientation, and network economics.

The following sections of this report depicts assessments and evaluations of the changing working world, from all interviewees' perspectives.

2.1. Work in Transition

Automation and digitalisation have changed the way we work and will continue to do so in the future. Therefore, an essential focal point of the survey was the following line of questioning: To what extent does digital transformation cause changes to the work routine and to work processes? To what extent does, for example, the increasing flexibility of work, as well as larger spatial and temporal distance with regard to organising teamwork, raise the bar for employees' communication and cooperation skills? Table 1 summarises the interviewed professionals' most common responses to the question of the characteristics of work in transition.

Table 1: Work in transition (cross-functional)

- Uncertainty among employees
- Increasingly important: support of employees
- Need for real interaction increases with level of work complexity
- Digital change as a driving force for careers
- Strategic assessment of digital trends' sustainability
- Speed of transition

According to the survey, a majority of interviewees noticed increasing levels of uncertainty among employees: uncertainties regarding the direction digital change is taking, the increasing complexity of work, as well as job security. A variety of surveyed professionals emphasised the need to view digital transformation as a goal-oriented transformation process, in which employees are supported with regard to emotional and procedural natters. Employees should thus be given the opportunity to speak openly about fears and anxieties.

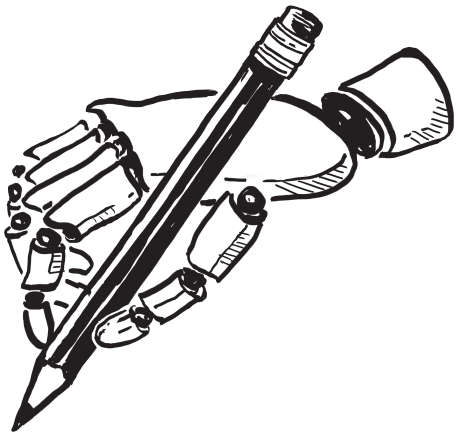
The majority of respondents agreed that the opportunity of digital communication across multiple locations reinforces the need for real interaction. For complex project designs, interviewees particularly preferred direct exchange, which allows for the classification of nonverbal communication.

Respondents also felt very inspired and motivated given the emergence of new fields of activity, modification of existing tasks, and resulting career opportunities. Digital transformation has been clearly identified as a driving force for personal careers.

The strategic assessment of digital trends' sustainability was identified as an important hallmark of the future of work. In this regard, the following questions (among others) are paramount: Where does the digital journey lead us? What trends will be considered as sustainable in the long term? What areas are worthwhile for long-term investments? The assessment of digital trends' sustainability is made increasingly difficult by the speed of digital transformation.

2.2. Replacing Manpower

The replacing of human labour by machines is one of the essential issues in the critical discussion on digitalisation. In the 1980s and 1990s, two alternative scenarios for the future organisation of work were already being discussed: one scenario followed the model of a factory, highly automated yet not completely devoid of human labour. In addition to the automation of work processes, technical systems should control and shape the remaining employees' behaviour (Karcher, 2015). An alternative scenario continued to stress people's central role in production and working processes. Apart from the relevance of teamwork, the individual plays an active part in the introduction of automation solutions.



Similar scenarios are discussed in the context of the developments within industry 4.0. Are technical systems replacing people or are they merely supporting them? Do we see ourselves as mere «servants» to machines or more as «users»? Is flexibility in labour and production processes achieved by flexible machines, flexible employees, or a combination of both?

Across all functional groups, the following scenarios for the next 5-10 years can be summarised (see Table 2.):

Table 2: Replacing human labour (cross-functional)

- Instead of downsizing, relocate employees, thereby creating new positions
- Current shortages of specialists and complexity of human-machine interaction are evidence speaking against replacement of employees
- Automation of routine tasks will increase efficiency
- Continuous need for the ability to judge, despite mechanical assistance
- Transformation of skills will be necessary, such as software applications, psychology, diagnostics, IT

The majority of the interviewees predicted that no large-scale job cuts will take place within their own companies. Participants view human labour as an integral part of future production and working environment. The continuing shortage of skilled labour, as well as the increasing complexity in human-machine interaction, in their view speaks against an extensive replacement of human labour. In the HR recruitment process, for example, HR professionals are increasingly relying on computer-aided methods for pre-selection process. However, HR-experts emphasize that the ability to judge, based on their experience and knowledge, will continue to play an important role in final hiring decisions.

However, it has also become clear that some areas of work will cease to exist in the future, in the face of increasing automation. Digital transformation considered as a mean to enhancing efficiency, will cause standardised routine activities to be continually automated. In this context, the interviewees identified

the following main areas for automation: Administrative tasks, logistics, production, and customer service. It is possible that some activities will become more challenging, which is currently still difficult to estimate. In general, listing positions that are most likely be affected by automation is much easier for respondents than defining emerging future occupations.

Employees of the future will need to acquire new competencies : therefore, dealing with technological solutions in the field of knowledge transfer, the use of computer-aided forms of learning, psychological expertise in designing change processes, as well as the long-term cooperative design between human interaction, will be of increasing importance.

2.3. Occupations Concerned

It is frequently argued in relevant publications (including Becker, 2015) that in the context of industry 4.0, employees at intermediate skill levels are encountering higher requirements of complexity, abstraction, and problem-solving. Low skilled workers, on the other hand, will have less room for manoeuvre due to shrinking possibilities of intervening in work processes as well as dictated procedures. However, since empirically verifiable statements are currently still pending, investigations should therefore broach the issue of which occupational groups will be particularly affected by the digital transition. To what extent do requirements, in terms of qualification and skills, change if production and work processes become increasingly electronic, decentralised, and closely linked? The interviewees see a growing need for the following occupational groups in particular (see Table 3).

Table 3: Increasing demand occupational groups (cross-functional)

- Designers
- Generalists with specialist knowledge and experience
- Software developers / IT (e.g. data security)
- Data analysts
- Consultants (within the organisation)

Future product development will emphasise the importance of aesthetics and design in product design. Furthermore, there is a need for generalists with specialisation – professionals with the ability to see both the micro and macro perspective.

The more data collected from customers, the more companies are challenged to deal with issues of confidentiality regarding evaluation and transfer of customer data. Thus, here is a need for technical experts within ICT security. Generally, there is a need for more personnel with data-analytical know-how, and an affinity for numbers (due to their importance as a supportive factor in decision making).

According to the interviewed specialists and executive staff, internal and external consultants' central task is to lend support and advise during the digital transformation, therefore skills in these areas are particularly sought-after.

Professional groups with a high probability of facing extensive changes in terms of tasks and duties are

the following (see Table 4):

Table 4: Occupational groups with changing fields of activity (cross-functional)

- Production / logistics / customer support / back office: machine replacement of manual, standardised and repetitive work
- Production: use of artificial intelligence
- General: short- or long-term automation of professions that require no experience, no ability to judge, no evaluation
- Identification of opportunities for development and qualification

The interviewees predict that standardised and repetitive work will be continually replaced by machines not only within in their own field, but especially within the areas of production, logistics, customer support and back office. The use of artificial intelligence will play an increasing role in production. However, it is also emphasised that the removal of repetitive and administrative activities should be seen as an opportunity to tackle meaningful and innovative tasks instead. In the long term, the interviewees view those occupational profiles that do not require experience and / or human judgment as endangered. New opportunities for development and qualification in the context of PE-measures should be identified for those occupational groups that are affected by the digital transition, particularly with regard to possible rationalisation measures.

2.4. Opportunities of Increasing Digitalisation

With regard to digitalisation, the interviewees were asked which opportunities they see for themselves and their employees in the next 5-10 years. Table 5 summarises the essential aspects across functions.

Table 5: Digitalisation and windows of opportunity (cross-functional)

- Inter-generational teamwork as a learning opportunity for both young and old
- Continuous development of employees
- Establishment of new occupational fields
- More self-determination, support for pioneer spirit
- Intensified target orientation in customer service, development of products, and in internal and external consultation processes

Intergenerational teamwork in the digital age is seen as a learning and development opportunity for both young and old. Among other things, companies run try test of L&D measures such as reverse mentoring (i.e. junior coaches senior), focusing on specific issues such as social media, blogs, Twitter and Wikis. According to our interviewees, the advantages go far beyond acquiring digital skills. Managers are able to learn more about what moves Generation Y, its attitude and behaviour, and about new trends: What makes the company attractive to young employees? How can we improve our employer branding?

Digital transformation requires employees' continuous development. The objective of life-long learning is seen as a chance for new individual career paths to open up. Due to the emergence of new business models, it is possible to offer qualified employees new development opportunities and qualification measures. Respondents predict the emergence of new occupations and operating fields during the course of digital transformation.

Interviewees report digital transformation to strengthen individual inventiveness. Employees should be encouraged to try out creative and unusual ideas in a specified period, and within a defined budget. An essential criterion for the «trial and error» approach is the transfer of personal responsibility to the employees, in order to increase innovation.

The collection and structured analysis of large amounts of data is seen as an opportunity to make customer service even more personal, resulting in tailor-made final product for the client. Dealing with large amounts of data, introduces the potential to investigate complex relationships in more detail, and to base decision process on a more solid foundation.

2.5. Challenges of Increasing Digitalisation

In the survey, the interviewees stated which challenges they foresee for themselves and their employees in the next 5-10 years, in view of increasing digitalisation. Table 6 summarises the key aspects across functions.

Table 6: Challenges of digitalisation (cross-functional)

- Increasing demand of resources caused by information overload
- Establishing trust with respect to the considerate use of customer data
- Pace of change
- Giving up old working habits
- Fault Tolerance («Act fast, fail-fast»)
- Redefinition of requirement profiles / employee competencies
- Increasingly blurred lines between work and leisure

Respondents speak of a perceived flood of information, statistical parameters and selectively alleged facts. The sorting and filtering of available information, as well as assessing their relevance and veracity, requires higher resource costs.

The increased collection and use of large-scale customer data, requires transparent communication with regards to the intended use of personal data. It is crucial to establish a sustainable relationship of trust with the customer, regarding the responsible use of big data.

For a wide range of respondents, digitalisation involves giving up familiar working processes, common computer-based applications, and long-established teaching and learning methods for internal education and training (including «popular seminars»). Digitalisation therefore requires individual change, flexibility to new ideas and the willingness to modify well-established workflows.

Respondents stress the need to introduce more fault-tolerance and to strengthen individual employees' responsibilities. If a company wishes to foster an agile and innovative business structure, a constructive fault-culture needs to be established.

Digital change makes it necessary to re-define qualification profiles with regard to digital skills. What mission-critical skills do employees need to bring to the table, or even acquire, in order to be successful in the future?

A side effect of the new working world is the possibility to work in mobile and flexible ways; in- and outside of the company. Mobile devices allow us to work anywhere, anytime, using cloud solutions and VPN connections. Participants report that on the one hand, this flexibility gives them increased autonomy over the combination of work and leisure, but on the other, it leads to blurring the two spheres. E-mails are thus, for instance, dealt with in the late evening, at the weekends and / or during the holidays.

«For the next five to ten years, I think we will be on the way up.»

Rolf Roos

Director Software Development
Komax AG

Rolf Roos, director of software development at Komax AG. Prior to joining Komax AG, he acted as a software manager at Besi Switzerland AG, as well as managing director and owner of RELEXON Engineering GmbH. He studied electrical engineering at the HSR Technical University in Rapperswil.

How does your company KOMAX deal with digitalisation? Digitalisation is a key issue. Currently, there are several working groups dealing with digitalisation in their respective fields. One part includes the digitalisation of our products and services. For instance, within development we are working on making the machines fit for industry 4.0 for our customers. On the other hand, we optimise our own business processes. Here too, we want to further automate and digitise our processes.

Do you see any challenges regarding digitalisation and communication? Yes, communication always takes place in a multi-faceted way. There is not only speech, but also facial expression and body language, which show me if my opponent understood me. Therefore, it is very important to me that physical meetings be maintained when it comes to complex or critical issues.

How do you assess your company's potential for artificial intelligence? The potential is great and I think we will benefit from it in the future. There still need to be limits. Not all subjects are suitable to be evaluated and edited via artificial intelligence. There are data-protection issues to be taken into consideration from the start. This is frequently overlooked, especially at the technical level.

«Filtering information is a challenge for executive staff – getting the right information to the right people»

Do you expect any changes in the number of people being employed in your company? I can only speculate, but right now all signs point to further growth. Increasing digitalisation leads to the emergence of new professions. Software products' ever-shorter release cycles, for instance, require an efficient transition from development to production. To improve, automate, and run these processes, the job description of DevOps-engineers was established. This way, digitalisation also generates new jobs. In the next five to ten years, I think we will be on the way up.

Has digital transformation caused you to change your leadership practice? Personal contact and personal communication are crucial, especially during digital transition. Good teamwork is based on mutual trust. Digitalisation or not - this is most easily created through personal exchanges.

In terms of leadership, how do you generally assess these changes? Digitalisation, digital media and rapid communication channels create an abundance of information. Filtering information is a challenge for executive staff – getting the right information to the right people.

Where do you see digital transformation challenging your leadership role? It is important to reduce uncertainties. You need to show your employees the opportunities, perspectives and development of digitalisation. It is pivotal to develop a comprehensible and solid strategy, defining the short and long-term direction of the company.

«Bottom line, there are more advantages than disadvantages in my view.»

How do you deal with the overall speed of digitalisation at Komax AG? It is important to stay focused on essential issues and to distinguish between real trends and mere hypes. Within software development, we have a team that deals with these issues and regularly analyses technological trends.

What advantages and disadvantages do you personally experience, given constant connectivity? In my daily life, I do not experience this as a burden. Communication outside working hours mainly takes place in written form. Thus, it is up to me whether I want to answer right away or not. Every now and then it even leads to an interesting chat. Bottom line, there are more advantages than disadvantages in my view.

How do you manage this personally? Good time and work management is important to me. That is why I take time every Friday to plan the week ahead. For this purpose, I make a digital checklist, which I can quickly re-prioritise if needed. My job, just as my leisure time, is part of my life and I do not strictly separate the two. Sometimes, I read important emails outside working hours.

3. Leadership and the Workplace 4.0

3.1. New Management Approaches and future changes in leadership

In their predictions for 2016, major market research firms such as Gartner, IDC and Forrester concluded that digital transformation will be the most important strategic objective for CEOs. In order to implement digital transformation effectively and in a sustainable manner, leadership and a proactive approach are pivotal. The following section reflects the results of the leadership function group from the survey. For executive staff, the focus of the survey lay on the exercise of new management forms and changes in leadership practices (see table 7).

Table 7: New management approaches

- Emphasis on individual responsibility rather than extensive control
- Less hierarchically arranged leadership – rather, leadership on equal terms
- Coaching employees: how to focus attention and set priorities
- Dealing with increased pressure to perform
- Increasing transparency of work processes and the efficiency of project controlling
- «Trial and Error» in shorter time frames

The executives surveyed state that future management approaches should strengthen employees' individual responsibility and establish a corporate culture of trust, so that employees do their jobs conscientiously and deliver high-quality work.

Executives witness changes in their leadership roles regarding higher coaching demands. Given project designs' rising complexity, as well as information overload, they see themselves as guides and facilitators.

Overall, a vast number of executive staff report the necessity of being able to reflectively and conscientiously deal with rising pressure. The respondents identify the fast pace of change, cost pressure, and rising expectations of different stakeholders as essential aspects of increasing performance pressure.

According to the executives surveyed, digitalising work processes increases transparency and efficiency of project controlling.

The development of innovative business ideas and products sometimes requires the implementation of test runs and short-term experiments. Instead of defining long-term development strategies over 5-10 years, innovative product ideas are being tested within a specified time window and budget frame.

3.2. Leadership Challenges and Diversity Management

As part of the interviews, the executives were asked about challenges for their own leadership role in the next 5-10 years (see table 8).

Table 8: Leadership Challenges

- Emotional and procedural support of employees during change processes
- Procurement of job security and reduction of uncertainties
- Identifying future prospects for individual development opportunities
- Fostering inter-generational work
- Sustaining competitiveness through technological innovation
- The need to constantly reduce costs

Attending to employees emotionally and procedurally during comprehensive change processes was depicted as one of the main challenges in the context of digitalisation. Choosing the right forms of communication, the nature of employees' involvement, and dealing with uncertainty are key issues of organising change processes.

Employees fear pending job cuts in light of pessimistically coloured press reports on the impact of digitalisation. Executives thus emphasise the importance of conveying job security and taking individual fear seriously.

It is essential to demonstrate professional groups, which are affected by restructuring measures in their fields of activity, new development opportunities at an early stage. In this way, their long-term perspectives in the company are being addressed.

The interviewed executives regard tolerance towards different communication styles and work habits as important when merging different generations in the process of digitalisation. While members of one generation prefers communication via phone, employees of other generations may principally communicate via online chat forums.

Another challenge described by the interviewed managers is the dilemma between introducing new digital business models while acting upon cost pressures.

Further main topics of this study are inter-generational leadership, and successfully bringing together different age-groups in the workplace (see table 9).

Table 9: Challenges of inter-generational management

- Merging heterogeneous modes of operation and different levels of technological understanding
- Combination of experience and knowledge (from older employees) with tool-related skills (from younger employees)
- Tolerance towards generation-specific preferences in structuring and dealing with work content
- Strengthened commitment to older generations

Regarding handling diversity in the workplace, executives report that balancing heterogeneous modes of structuring work and different levels of technological understanding, represent the essential challenges for leaders. They stress the importance of facilitating cross-generational work, and appreciating the respective generations' strengths in a constructive dialogue. Older employees should not be collectively described as less flexible within the digital transformation. Instead, older employees' experience should be cherished and each employee's disposition should be evaluated individually.

«Digitalisation absorbs me day and night.»

Gabriela Brönimann
L&D Director
SRF Schweizer Radio und Fernsehen

Gabriela Brönimann is Head of L&D at SRF Swiss radio and television. She joined Swiss Radio DRS in 1992, having previously worked at a newspaper. Gabriela Brönimann studied Journalism and Communication in Fribourg.

How do you deal with digitalisation? Digitalisation absorbs me day and night. It has a great impact on my role as head of training. The subject of learning and in-house training will change substantially due to digitalisation. In the field of online journalism and social media we already work with different learning and teaching methods. But that is not all. I assume that in-classroom teaching will be replaced. The method of standing in front of people, telling them how to do it, is over. A great change is taking place in this field. We will create less and less curricula that we can use over a longer period of time. The ever-changing environment requires more agility and the ability to offer new and shorter formats.

How do you experience these changes personally? As a trained journalist, curiosity is part of my job. I find it exciting, interesting, stimulating and important to evolve alongside digitalisation. However, there is a difficult side to this change. Digitalisation is so fast-paced that, from time to time, I feel like I am missing the connection. I am over 50 and not a digital native. I did not grow up with it and have to learn everything. Of course, this takes time and is a real challenge for me.

How has the learning process at SRF changed through digitalisation? People increasingly learn «on the job»: either amongst themselves, or over the course of training. We increasingly also engage super-users. Super-users are employees, who we train so that they can pass on technical knowledge target-specifically. Besides deepening their technical skills, they also receive «train the trainer» training. Interdisciplinary and interconnected learning is still a challenge due to employees' reported shortage of time.
But once they attend, they enjoy it. Our short lunch events on current topics, such as «Artificial Intelligence», «data-journalism», and «leadership», on the other hand, are well attended. I am very confident that learning will increasingly be a part of everyday work. In that case, the question of how to record this time will arise. Today it is easy: one can record eight hours per course day. To improve our employees' expert knowledge, we tried a new form of learning. Employees who wanted to extend their know-how were encouraged to apply to the «focus-learning» program. SRF allowed workers 48 days and paid for their training. Some took courses at universities, others visited experts. A business journalist, for example, went to Silicon Valley to learn about «The impacts of disruptive technologies on retailers and consumers». After her return, she quickly applied her new knowledge.

«The topic of learning and in-house training will change substantially.»

How do employees deal with the digital transition? The willingness of employees to change must increase. One cannot simply say that older employees possess less affinity for new tools. Nevertheless, we realise that young people grow up with those tools, and because of their digital so-

cialisation they already have an advantage over others. Some older colleagues have trouble changing because they have gained a lot of confidence over the course of their careers. All of a sudden, they are expected to do things differently. These conditions require careful supervision and support.

What changes do you experience with regard to leadership? It is often the case that the most skilled professionals become executives. To them, human resource development is often of secondary importance. This will surely change, for nowadays, what was predicted in the MAS learning management training in 2008, is becoming apparent: «Supervisors and staff members themselves design and control the processes of organizational learning. Training officers take up a supportive role». Considering leadership, there are many new topics: agility, design thinking, mastering complexity, all of which are issues that we already cover in leadership training courses. My role will most likely also change, be it because of a new organisational structure, such as «holacracy», or simply because hierarchies are becoming flatter. Furthermore, it is important to me to share knowledge more widely. Nowadays, many want to keep knowledge for themselves – after all, they have worked hard for it. I think one of the future requirements for leaders is to encourage people to contribute and share their knowledge. That is easier said than done, especially among journalists, since the idea of competition has been important for a long time. Who writes the best article? What channel gets the story first? Who has the primer?

What skills are required from your co-workers with regard to digital transformation? Mobility and networking skills will be in high demand. Furthermore, inter-disciplinary and cross-cultural forms of work are on the rise. Digital skills are becoming increasingly important. As a journalist nowadays, the amount of information coming in is much larger. Additionally, tracing the sources of information has become much harder in the age of the internet.

What is your strategy for dealing with digital diversity? As part of talent management, we encourage our staff to apply for leadership positions, and, of course, to become digitally adept. In addition to internal training opportunities, the training division has also invested in external training and further education in recent years. External training in digital leadership is increasingly sought after by executive staff. There are good training opportunities nowadays, but with some, I feel like the content has not changed significantly – instead they simply put the word «digital» in the title.

«Agility and linking skills will be in high demand.»

In the field of training, what opportunities and challenges do you see for your employees regarding digitalisation? Training supervisors will be less likely to run their own courses, and instead will take on responsibilities as learning guides, coaches or facilitators. They will become more connected and their work will become more interdisciplinary. I think this a positive development. It constitutes job enrichment because employees are able to work more on cross-sectoral projects. However, all of these changes are a big challenge for any employee. Are they fit enough? Are they able to change? Do they want further training? Workers furthermore have to learn how to cope with insecurity, since nobody knows what comes next.

How has the role of training officer been affected by this? It is a mixture between continuing to work as is, and switching to a future way of functioning. (Laughs) I have to be agile, while at the same time have a clear goal in mind. So far, my focus has been on organising formal training programmes (planning, development, administration, distribution). Currently, I feel that the trend is leaning towards interdisciplinary learning networks within companies, trying out innovative learning approaches and supporting employees in their new roles as learning guides and facilitators.

To what extent does digitalisation affect your HR-strategy? We have to recruit more young people. We also have to invest in the development of colleagues with digital know-how, because if we refrain from doing so, they will quickly be gone. It is not like it used to be, when most people stayed on if they got a job at SRF. This is why talent management today is awarded previously unknown value.

In terms of digital connectivity, what advantages and disadvantages have you personally experienced? I feel a certain uneasiness, more than I

used to, from being here, there, and everywhere. I call this «nibbles-behaviour». This tendency has grown stronger due to social media. In journalism, the blurring of private and professional boundaries has always existed. You are a journalist even when you sit at home, reading the newspaper. I believe that the sheer amount of e-mails waiting to be answered, plus the constant availability can be detrimental to a person's health and their social life.

4. HRM and the Workplace 4.0

4.1. Changes in the Company and in the HR Function

Demographic development, lack of skilled labour, flex work, attractive employer branding, as well as attracting and retaining qualified employees, are but some of the issues which organisations will have to address in the future. The classical instruments and processes of human resource management (HRM) may not be able to keep up with the fast-changing requirements in the different areas of business – be it with regard to recruitment, or evaluation and skills development. The transformation of the HRM's role from administrator to business partner has thus far resulted in changes to the field – the interviewed HR professionals in this survey illustrate this development based on fundamental changes in recruiting processes, which have occurred in the face of digitalisation (see table 10).

Table 10: Changes in recruiting

- Increased use of social media in recruiting talent
- Establishing contact prior to recruitment (through internships, supervision of Master's theses, social media)
- Reverse recruitment: Potential candidates expect active sourcing
- Young candidates: Active search for digitally progressive companies

HR managers in this survey report that the use of social media for talent recruiting has been firmly established.

Establishing and maintaining contact with potential applicants prior to recruitment, via internships or the supervision of Master's theses, for example, is gaining importance. In this regard, HR professionals are observing the development towards a job seeker's market; potential candidates expect companies to directly approach them.

Young applicants are particularly likely to choose their future employer based on the company's digital progress and outlook.

The changes described in the recruitment of employees leads to adjustment of the definition and exercise of the HRM's role regarding recruiting and employee retention. It is clearly becoming more proactive (see table 11).

Table 11: New trends in staff recruitment and employee rentention

- Active recruitment
- Pointing out employees' long-term development opportunities, regardless of digital transformation
- Accepting employees who want to stay in their current professional position

An industry's attractiveness is increasingly judged by the extent to which the company faces digital progress head on, and thus play a pioneering role. Even though digital components play a role in the retention of qualified employees, analogous criteria still stand at the foreground: employees will commit to a company long-term if they are given development opportunities and individual appreciation, and if a constructive team culture is created.

In addition to the expectation of individual adaptability and willingness to change, employees should be accepted who want to continue in their current position.

4.2. Challenges for HRM

The HR managers' will encounter the following challenges in the next 5-10 years due to digitalisation (see table 12):

Table 12: Challenges for HRM

- Definition of new job and skill profiles
- Emphasis on the importance of «empathy issues» and building of relationships
- Dealing with new software tools
- Increasing implementation of paperless work
- Delegating routine activities to machines
- Increased focus on numbers and facts in HR
- Being aware of hasty conclusions drawn from big data
- Dealing with resistance to the digital transformation
- Lifelong learning

Digital change, and the emergence of new occupations and job profiles, require the design of new competency profiles and the definition of skills, critical for success in the digital transformation. In addition to digital communication, as well as mobile and flex work, the interviewees emphasise the importance of interpersonal relationships. The human factor and the importance of empathy cannot be less relevant in the digital world.

Even HRM must deal with new software applications. Paperless work and mechanical processing still pose challenges for some companies.

According to our respondents, big data is moving into the sector of human resource management, for

instance in recruitment and talent management. With increasing focus on numbers, it becomes more and more evident that qualified analysis and interpretation of data requires trained staff.

It is important for HRM to deal constructively with resistance to renewals and restructurings over the course of the digital transformation process. It is imperative to sensitise co-workers to the fact that lifelong learning is a necessary pre-requisite for remaining employable.

«Digitalisation has already greatly simplified the design and setup of work processes.»

Daniela Angius-Braun
Head of Human Resources
Würth International AG

Daniela Angius-Brown is Head of Human Resources at Würth International AG. Before starting her career at Würth International, she worked as a HR assistant in different companies. Daniela Angius-Brown completed her apprenticeship at Zurich Insurance.

How do you evaluate the changes to your function due to digitalisation? We have been concerned with this issue for some time now. I am mainly in charge of the whole change management process, which is an important aspect of digitalisation. Digitalisation brings with it changing requirements and competencies. Another focal point, for example, is the impact of digitalisation on corporate culture. Finally, in my traditional HR role: Where can the area of HR benefit, and how can we optimise our work?

Can you already see any changes regarding process optimisation and simplification? Yes of course. Process design and set up has already been greatly simplified. We were able to eliminate routine work, as well as standardised tasks, to a big extent. The goal is for routine tasks to be carried out by machines so we that can spend our time on more exciting and challenging tasks.

Do you fear a wave of job losses in the wake of automation? No, because, for instance, we have already automated many manual tasks in our logistics centre. Because of this, it was possible for us to continue the warehouse expansion with the same number of employees, while at the same time increasing its capacity further. The aim should be to digitalise monotonous work so that more resources can be allocated to interesting and challenging tasks. In this way, the circle is once more completed with regard to changing skills.

«There were no job-losses in the course of automation.»

What are the challenges for your own position? Digitalisation has moved into the area of HR, for example in the area of recruitment. Nowadays, the candidates on the labour market simply wait for the company to approach them, rather than the other way around. This trend leads away from traditional applications towards candidates uploading their applications to the appropriate communication platform, saying: «Hello market, here I am.»

Will the recruitment process become more of a challenge in the future? Yes, this changed mode of interaction is certainly an issue that we will follow closely. How do I find the right people? What channels do they use? This requires the HR department's full attention and it needs to act. Especially when it comes to attracting the younger generation's attention, the question arises: What channels should we use? Are they really on LinkedIn and XING? I'm somewhat sceptical.

Can you think of any challenges to performance evaluations in view of increasing digitalisation?

That is an interesting question, and one I cannot answer conclusively. For me, performance is not merely about quantity, and those tasks, which are digitised, are primarily in the quantitative area. In our business, however, this area is of rather secondary importance. For instance, should I evaluate employees in the finance department based on how many bills they process a day? Again, the idea is to measure how many monotonous tasks could be digitised, and how many of the resources could be re-invested into more value-added tasks.

How do you define employees' necessary competencies? For instance, does it take willingness to change? Yes, willingness to change, but above all openness, curiosity and genuine interest, in addition to the willingness to acquire these new skills. Nowadays, we need employees who say, «I'm doing it, I am willing to engage in new processes.» This is certainly not always easy, particularly in an international environment. In addition to language skills, you also need an understanding of how to deal with different cultures. Flexibility and willingness to travel are also required. Nowadays, change management is part of the daily work.

What strategies do you use to attract and retain employees in the future? On the one hand, by means of classic approaches, such as market-driven salaries, attractive employment conditions, and through our commitment to workplace health management. In this final area, we particularly want to stand out from other employers – this way we are setting ourselves apart. We conduct regular employee satisfaction surveys and look at how we position ourselves. We invest a lot in our image so that we are perceived as a modern employer. We do not recruit in the classical sense anymore, but make use of modern tools. It is important to us that employees can live out their lives and take responsibility. One of our advantages is certainly that we can offer an international environment.

What opportunities and challenges exist for your employees? Chances are that through automation of administrative tasks, one's work becomes more exciting and varied. One challenge might be that an employee is no longer suitable for the restructured job due to digitalisation and together we have to find a solution, such as replacement or retraining.

What opportunities and challenges do constant digital accessibility bring? One advantage is that I can choose the moment in which I want to obtain a piece of information, since I receive them regularly. The challenge is to set boundaries on how to handle it personally.

«We invest a lot in our image, in order to be perceived as a modern employer.»

Do you experience effects on your health resulting from constant connectivity? No, generally connectivity is not a burden to me. However, like everybody else, I do not deal with all issues the same. It depends on how appealing a topic is to me. The more the task is of interest to me, the less I feel overwhelmed. Thus, it is one of my tasks to ensure that I receive exciting tasks and to automate everything else as much as possible. Since I am curious on principle, I cannot turn this off while on holiday and therefore regularly read my e-mails. Since the expectations about my answering are relatively clearly set, I can decide for myself whether I want to answer an e-mail. My superior, who is very keen himself, frequently works on weekends and sends out e-mails. However, he does not expect his employees to respond straight away.

5. Training/Organisational Learning and the Workplace 4.0

5.1. Changes in Learning Cultures and Learning Practices in Companies

The restructuring of the economy from mass production to cloud-driven, tailor-made services for each customer, as well as using large amounts of data to generate services and products, are changing job profiles, structures, and work relations. Human resources development as a core process of support, and organisational development is required to contribute to the success of workplace 4.0. Predictions see parts of the future working world as highly decentralised and individualised (see Becker, 2015), which is why decentralised and tailor-made educational measures are offered correspondingly. Together with the function group responsible for in-house training and development – hereinafter referred to as «Learning and Development» (L&D) – the current study broached the issue of changes in the design of organisational learning, i.e. the learning culture and learning practices within the company (see table 13).

Table 13: Change in organisational learning, learning culture and learning practices within a company

- Substantial reduction of in-class courses
- Increase of digital learning environments, blended learning (70:20:10 learning models)
- Increased «on the job» learning
- Acquiring knowledge through e-learning, providing quickly accessible learning content, use of digital learning environments
- Emphasis on a self-determined, self-responsible and dialogue-oriented learning culture
- Establishment of new and central forms of learning and collaboration
- Human and emotional forms of learning (e.g. meetings, celebrations, games as prototypes of learning)

According to the surveyed L&D managers, there is a clear decrease of in-class courses, whereas digital learning opportunities (as well as the use of 70:20:10 learning models) are on the rise. Organisational training is increasingly integrated into everyday work. Knowledge acquisition is increasingly happening via e-learning and digital learning opportunities.

Learning should be individually accessible at any time, and network learning should be promoted above all. Therefore, learning and collaboration platforms that support «peer to peer» learning are being established within companies.

The interviewed L&D managers emphasised that, in addition to providing digital learning experiences, the prototypes and original motivation for human learning such as emotional learning should not be neglected (e.g. during talks, celebrations, play activities).

5.2. Challenges for L&D Managers

Table 14 lists the challenges for L&D managers regarding digital transformation.

Table 14: Challenges for L&D managers

- Generating cooperative forms of learning and practicing interdisciplinary exchange of knowledge
- Use of digital tools according to target group: digital learning not as an end in itself, strategic priorities rather than oversupply
- Strengthening / extension of own digital competence, e.g. in the use of tools
- Dealing with digital diversity (patience and persuasion)
- Encouraging a culture of self-reflection among employees
- Space for experimental learning and an active error culture (taking into account safety and quality)
- Promoting employees' adaptability and openness in the face of fast moving change
- Increased pace of work and dealing with uncertainty

Digitalisation of business processes is usually the same across all departments and concerns different occupational groups. Therefore, interdisciplinary exchange of knowledge and cooperative learning is becoming increasingly important, according to the interviewed L&D managers.

Digital teaching and learning should continue to focus on the company's strategic direction and its defined learning goals. Negatively mentioned were the use of digital learning tools as an end in itself, as well as unconditionally following «digital hypes» regarding in-house education and training.

In the implementation of computer-assisted and automated applications, or all-encompassing digital restructuring respectively, it is important to exercise tolerance and patience. By accompanying employees in their individual development portfolio and helping them in the process of self-reflection, the employee is empowered: Where do I stand in relation to the defined requirement profile? How can I update my performance profile with the help of my manager, supervisor, colleagues, or further training opportunities?
In-house education and training play a substantial role in developing a constructive error culture. L&D managers can contribute substantially to the consolidation of experimental forms of learning, as well as a lively error culture at work.
Another challenge for L&D managers is to strengthen employees' adaptability and openness to future

changes, particularly in the face of the increasing work pace and the often-perceived uncertainty of the digital transformation.

5.3. Changes in the Supervisor's Role from an L&D Perspective

The encompassing digitalisation of operations and business models requires different management levels to play an active role. How will leadership thus change, and which roles will executives play in the design of teamwork? In the following section we summarise the qualitative analysis of the interviews with L&D managers, regarding possible changes in the role of superiors within the context of digital transformation (see table 15).

Table 15: Changes in the role of superiors

- Managers as facilitators, increasingly inhabiting the role of staff developer, coach, sparring partner and meaningful role model
- Guidance of employees' transformation and development
- Emphasis on employees' personal responsibility with regard to their careers (i.e, «own your career»)
- Establishment of a culture of trust by introducing mobile and flexwork
- Careful communication and implementation of change processes

In the digital age, managers are increasingly seen as learning guides, coaches and sparring partners, who accompany their employees' professional development in an advisory capacity. Given the increasing complexity of newly emerging occupational fields and activities, employees are, at the same time, responsible for their personal career development, as well as for identifying individual development opportunities.

Leaders of the future are encouraged to establish modern working forms, such as mobile and flexwork, and to build a culture of trust that enables employees to work anywhere, anytime, in- and outside of the company.

Change processes should be planned carefully and with the participation of major stakeholders. It is particularly important to ensure the careful implementation and communication of change processes. If possible, upcoming changes should not be implemented abruptly and employees' uncertainties and fears should to be taken into account.

«There are job descriptions, we do not even know yet.»

Bruno Schumacher
Head of Vocational Training
Swiss Post Ltd

Bruno Schumacher has been the head of vocational training at Swiss Post Ltd since the fourth of January 2017. For more than 15 years, he has been working in the field of vocational and further education and training, at different companies and in various capacities – most recently, as head of education and training at Post CH AG.

How do you deal with digitalisation? We deal with different questions: the use of digital tools, other new tools and associated skills are very important to us. Which new ways of work exist? How do we communicate with each other? Which measures will Swiss Post implement in this area?

How do you personally experience digitalisation? I experience digitalisation very positively, because I see new opportunities emerging. Home office, for example, is a form of work that is not always welcome and often not even offered. Fridays as home office days are especially associated with prejudice. I have been working with flex working hours at different places for over ten years and have had very good experiences. Working from home requires a high degree of trust and is a question of corporate culture. However, social interaction at work is very important to many people and allows for better and more effective teamwork. Both options have their advantages and disadvantages.

How will digitalisation affect the number of people working at Swiss Post? I hold the opinion that there will not be less work, but that the type of work will change. There are new jobs and new activities we do not know of yet, and which do not exist today. This is an unknown quantity in this subject. What is better known and more tangible, are the activities that can be eliminated. New achievements are not always visible at first sight. A good and plausible example is the smartphone: at its launch, it was not foreseeable how the device would establish itself as an integral part of everyday life. I am confident that the changes are going into a useful direction.

«Lifelong learning is a key factor for success.»

At Swiss Post, which occupational groups are affected by digital change? The change affects all employees and areas, without exception. The shift in consumer behaviour is very noticeable in the postal industry. Postal correspondence has been declining for years. Cash transactions are likewise going down constantly. While the need for employees will decrease in the transactional area, we will see a further increase in the ICT sector. More digital skills are required throughout, which places increased demands on the employees. A downward trend is beginning to show in human resource management, partly because of digitalisation.

How has learning been affected by digitalisation within your organisation? Fortunately, at Swiss Post, we have a long-standing tradition of teaching with digital tools and over 20 years of experience in in-house training. This will increasingly be adapted to digitalisation. Two years ago, for instance, many in-class seminars were cancelled because the costs were very high and scalability was low.

How do you evaluate these changes? Personally, I tend to assess these changes rather positively, as I am convinced this is the right way to implement digital transformation at all levels. Some employees, however, need vigorous persuasion, because they do not accept or are unfamiliar with these changes, or they do not possess the demanded skills with which to face them. We were able to implement a pilot project with the chauffeurs, who are expected to use tablets soon. The test was conducted in two regions and turned out to be a complete success. The initial response was usually: «Oh no, this is not going to work, me with a tablet? I need to drive a car, I cannot scroll around on a tablet.» In the end, there were many drivers who said: «I am never giving back my tablet.»

With regard to your own job, where do you see the challenges? On the one hand, in team collaboration; and on the other, on a personal level. Team collaboration will change. Making use of opportunities and taking employees on a digital journey, in order to ensure no one is left behind, are of central importance in the digital age, and for this, we need digital skills to use the corresponding tools. The standards I set for myself also change: Indreased levels of selforganisation, I work more autonomously, I need to motivate myself and create my own tasks. I cannot wait until my boss gives me orders. In short, personal responsibility will increase and self-organisation is the key to success. In my view, blended learning is the ideal solution for the future, and this has partly been implemented today. There are still some issues that require physical presence; those will be enriched with digital learning.

How will the role of supervisors change in relation to learning within organisations? Basically, we want to position supervisors in the role of human resource developers and give them more responsibility. They are an employees' first point of contact person with regard to learning and development, and only in a secondary step is HR to get involved in a training capacity and supportive role. Nevertheless, in the end, the lead for their individual development remains in an employee's own hands.

What is your organisation's strategy for dealing with digital diversity? We try to connect both the analogous as well as the digital world. We have introduced a reverse mentoring scheme, where younger employees provide senior people, or those who are not as digitally savvy, with 1:1 coaching for the introduction of a new digital collaboration platform. We are looking to make all age groups' core competencies usable.

How will career development change in your organisation? In our organisation, there are almost no linear career paths any more. People do not stay in their learned profession their whole lives. I am convinced that in the future, people will exercise five to seven different occupations throughout their careers. As a result, there will always be accompanying transitions and re-orientations. Career development must also address new issues, because there will no longer be «the» one career path. Lifelong learning will thus remain a key factor for success.

What advantages and disadvantages do you personally experience in the face of constant connectivity? For me, issues such as defining boundaries and managing expectations are of great importance: am I able to distance myself? What do I expect from myself? What do I expect from my team and my colleagues? These expectations must be made transparent, in order to avoid excessive demands. We have published guidelines defining the use of digital media; mobile phones are allowed to be switched off in the evenings, and e-mails by superiors do not have to be answered on weekends. Employees' personal responsibility and awareness are paramount. The workplace health promotion at Swiss Post raises awareness by implementing campaigns, such as «how much sleep does your sleep need?».

6. Technology and the Workplace 4.0

6.1. Challenges in the Design of Digital Transformation

The digital transformation, and the changes associated with it, often involve the complete realignment of business models and the reorganisation of established business processes. For companies, it is of fundamental importance to face digitalisation trends heads on and successfully push transformation. In addition to creating the position of Chief Digital Officer (CDO), initially in North America and expanded to Europe in 2013, different businesses have started hiring technology experts in management functions to oversee the digital change. For this reason, we also interviewed a group of technology experts and CDOs for this study. In table 16, we have summarised the challenges that technology experts and companies face.

Table 16: Challenges in the design of digital transformation – for technology experts and the company

- Implementing a digital mind-set – handling the rapid change
- Different degrees of employees' willingness to adapt to digital transformation according to individual life cycle phases
- Pressure on how to prioritise (e.g. investment in innovation)
- Focus on a constructive error culture
- Digital innovation projects explore new paths, yet are still planned and measured by the means of «old» management tools and KPIs
- Lack of harmonisation between industrial enterprises' traditional setups and the speed of digitalisation
- Dealing with the speed of information processing
- Readiness for change and flexibility
- Establishing more agile organisational structures in order to remain competitive

One of the challenges the interviewed technology experts mention is implementing a «digital mind-set», enabling their workers to act in an agile, flexible and quick way. Another challenge regards employees' willingness to adapt to digital transformation. Depending on their lifecycle stage (e.g. parents / grandparents of digital natives), workers may be more or less susceptible to upcoming changes and technological innovation.

The majority of the responding technology experts report a feeling of pressure when it comes to prioritising investment decisions: which innovation projects are strategically more important and promise greater customer satisfaction?

The establishment of a constructive error culture is likewise regarded as a challenge. Digital innovation projects require organisations to establish new organisational structures, and to critically reflect on existing process structures. However, well-established, close-knit controlling and compliance requirements tend to hinder employees' innovative and creative thinking.

When talking about a company's design of the digital transformations, one aspect that is regularly mentioned refers to the challenge of finding a balance between existing traditional organisational structures, existing time-consuming work processes, and the speed of digitalisation.

6.2. Strategies for Dealing with Digital Diversity

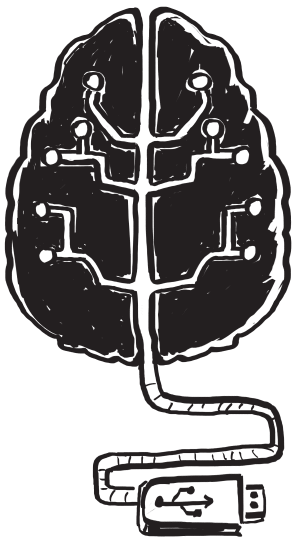
Employees' different levels of openness and attitudes towards the digital future, their varying soft- and hardware knowledge, or their use of social media reflect the digital diversity that exists within a company. In addition to employees' enthusiasm for new technologies, or the adaptation of process structures, other factors (such as physical access, appropriate skills, and frequency of applications) play a crucial role (see van Dijk, 2013). In table 17, the strategies mentioned by the interviewees for dealing with digital diversity within a company are summarised.

Table 17: Strategies for dealing with digital diversity

- Culture of open communication and transparent information on future developments
- Working closely with HR in developing digital strategies
- Targeted training of employees
- Consideration of employees' heterogeneous attitudes and age-related qualifications
- Conveying job security (including sympathy for process simplification instead of elimination)
- No definite strategy

Digital diversity requires a culture of open communication, in which future developments are clearly outlined. Digital diversity and different skill-sets require close cooperation with HRM. Providing employees with goal-oriented training in required skills and qualifications is pivotal for the implementation of the digital strategy and ultimately for a company's success.

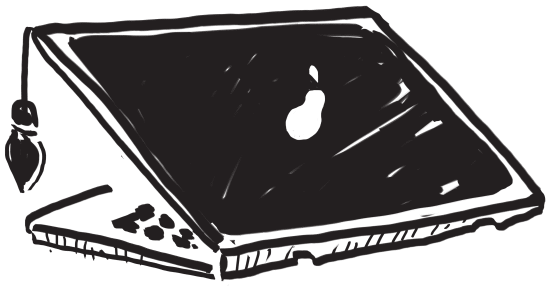
The sensitive handling of employees' heterogeneous attitudes towards digitalisation measures is an essential criterion for keeping up and making use of digital diversity. Employees who are strongly committed to digitalisation, as well as those who are less digitally savvy, should still feel at home in the company.



Conveying job security and the notion that digitalisation primarily means the simplification of processes, rather than the elimination of jobs, are considered central factors for successfully establishing digital diversity in the company.

Only a minority of technology experts state that they are not pursuing any specific strategy for dealing with digital diversity.

6.3. Required Skills for the Digital Transformation



The automation of production processes results in increasingly complex and highly demanding work processes. The use of computer-assisted systems and equipment turns simple processes into highly complex systems, which employees now only partly understand. It is still unclear, however, what skills and qualifications are required to ensure a successful man-machine interface. The social and technological changes in a changing working environment require the definition of new digital skills profiles for specific job groups. HRM will be particularly challenged in this regard. In addition to technological changes, all-encompassing cultural changes will shape the corporate world. The interviewed experts and managers pointed out the following cross-functional skills as particularly important for digital transformation: willingness to change, openness to new processes, ability to deal with complex tasks, time management, intercultural skills and readiness for lifelong learning. Digital-specific skills, which also apply to a broad group of employees, are based on an understanding of technology, data-affinity, and the ability to see technology in the context of economic development.

Table 18: Required skills for the digital transformation (cross-functional)

- Top management as a role model for the digital transition
- Openness to new processes (courage and curiosity)
- Willingness to change and agility in the face of rapid change
- Interdisciplinary thinking and cooperation
- Self-competence: dealing with complexity, structuring of work processes, information overload, time management
- Intercultural flexibility and competence
- Digital affinity (user experience, design thinking) and understanding of technology
- Data affinity and analytical skills
- Interconnected thinking (including technology and business)
- Ability for learning by doing
- Readiness for lifelong learning

«With big data to predictive maintenance»

Enrico Senger

VP Digital Innovation / Digitise the Field
Elevator and Escalator Manufacturer Schindler

What is your understanding of digitalisation? We have been talking about automation for a long time now, a lot of which has already been done in the 1980s. In the 1990s, marketing and sales migrated to the Internet thanks to eCommerce. Our communication has changed through social media. Digitalisation is now often used as a synonym for all these terms. For me, digitalisation means the use of technology specifically to develop new business models and thus to create customer value.

How do you, as head of digital innovation, deal with the subject? The question of how technology can be turned into potential customer value, is indeed the guiding principle of our activity. How can we empower our employees to serve our customers better by the means of digital solutions, and how we can create more value for our customers through digital products? How can we develop new business models from this? Is it possible to transfer existing skills to other domains? We will implement innovative ideas and turn them into solutions.

How did you optimise existing processes digitally? Sixty per cent of our employees are on the move, for instance as service tech-technicians, installers and retailers. They work best when they are with the customer. Our vision is a «digital tool box» - just as a physical tool box with all the necessary tools. A digital tool box provides the user with all the information and interaction possibilities, which enable him or her to complete the job on site. We started five years ago with the largest customer-facing group - the service technicians. The Field-Link app is being rolled out worldwide and is used by 30,000 employees on a daily basis. If there is a problem in a lift, Schindler employees get a notification on their iPhone, including instructions for the repair and the required spare parts. Last year, we introduced «Schindler Ahead» to the market (www.schindler-ahead.com). Thanks to the Internet of Things and data science, we know the current state of our elevators even more precisely and are able to predict potential problems. For instance, if there is chewing gum stuck between the guide rails of a door. With this information, our technicians can fix the problem before the door becomes blocked.

«One will not succeed in the digital transformation by doing technically interesting but economically unwise things. That is why we need technology professionals who also understand business.»

What jobs will disappear, and where in your field are employees with other skills needed? Anything that is repetitive will disappear – mostly jobs which require large amounts of complex calculations, as robots and computers are better at those. But digitalisation itself requires people with their inherent creativity and curiosity. Thus, the need for programmers is growing worldwide. Professional user experience designers are indispensable for digital products' acceptance and usability. In terms of data science and cyber security, the expert market is virtually dried up right now. A broad background knowledge, which enables experts to work in interdisciplinary teams, as well as having

the overall goal of innovation in mind, is what is really important in my view. Would you employ someone with purely technological know-how, if that person had no idea of the implications for business models? One will not succeed in the digital transformation by doing technically interesting but economically unwise things, because these either do not create enough customer value, are too expensive or are too complicated. That is why we need technology professionals who also understand business and likewise business economists with technological understanding.

How do you respond to digital diversity? Digital diversity, in my view, is a central prerequisite for success. By this, I do not simply mean having interdisciplinary teams from different technical fields. Different cultures, genders and age groups enrich a team because this way, a greater variety of solutions emerge. However, I do not think you should build teams according to maximum diversity, but instead according to interests and skill sets. «Digital literacy» is more of an adjustment than an age issue. I have met people in their late 20s who were very conservative in their thinking. On the other hand, there are service technicians who approach 60 and are still very interested in digital technologies. Apart from that, we have noted that openness to try new digital technologies is by far the highest in Asia. After that, the United States, and eventually Europe. Another interesting observation we have made is the large number of unsolicited applications from women for student placements, Master's dissertations, and professional applications in the area of digital innovation.

How does digitalisation affect innovation and leadership? Digitalisation has the potential to be a disruptive innovation and, due to the network-effect, it is often the case that only a single provider is ultimately successful. This requires agility and a willingness to radically question the current state. The traditional setup of industrial enterprises do not always harmonise with the speed and methods of digitalisation. For managers, this means that having a classic team of internal experts with a clear hierarchy within a department is not enough. We have already talked about interdisciplinarity and diversity. In addition to this, there are factors such as spatial distribution, and team members outside the official hierarchy: for instance those from other departments, from partners within the eco system, from the customer. Essentially, it is about leadership culture: all team members should identify with what is happening and how, and everyone should feel equally responsible for the company's success. There cannot be any second-class team members. If I, as a team leader, want to have a high-end team, I have to create a culture of individual responsibility. This is summed up nicely in a quote by Antoine de Saint-Exupéry: «If you want to build a ship, do not round up men to gather wood, assign tasks and divide the work. Instead, teach them the yearning for the wide and endless ocean.»

«It is no longer enough to consider a vocational training or an academic degree as a knowledge base for an entire career. Instead, one must educate oneself further, especially in the field of new technologies.»

How do you assess human resource development in this context? We have already talked about the shortage of digital talent. Many positions will remain vacant, especially if companies fail to reap employees' latent potential. People need to be taken by the hand and demonstrated what future skills are needed and how to keep on learning. At the same time, employees need to be aware that everyone is required to face the demands of digitalisation. It is no longer enough to consider a vocational training or an academic degree as a knowledge base for an entire career. Instead one must educate oneself further, especially in the field of new technologies. We expect the same from all of our employees – in return, we provide them with the corresponding opportunities

What advantages and disadvantages do you personally experience in the face of constant connectivity? Digital connectivity is a precondition for digitalisation. For example, we operate mobile solutions for our technicians worldwide and they need to work 24/7. If there are any problems, it is our standard and our task to fix them as quickly as possible. If we cannot provide this service, we are not properly taking care of our customers. This can be organised across different time zones in virtual teams. However, there

are some questions and decisions that I want to be involved in, which sometimes take place outside office hours. Constant connectivity requires personal discipline. How often is it necessary to immediately pick up the phone in a meeting, or to send text messages and e-mails instantly after receiving them? In this regard, a lot of time is wasted because one is not really able to deal with all the multi-tasking. It is also a matter of respect vis-à-vis one's colleagues. Digital connectivity furthermore blurs the boundaries between work and leisure time. This is not necessarily bad, in my view, as long as it generates benefits. Sometimes, ideas emerge while having a beer after work. However, sustainable success requires time for reflection and relaxation.

7. Permanent Connectivity

7.1. Opportunities

Besides the afore-mentioned fundamental changes of digitalisation, such as flexibility and increase in speed, the spread of digital and mobile information and communication technologies has likewise significantly affected working environments. Key developments include the prevalence of computers, internet, social media, mobile phones, smartphones, laptops and tablets at work. Computers are now an integral part of the working life. According to the German Federal Office for Statistics (2013), 64 per cent of people working across various classes of businesses use a computer at least once a week and at least 15 per cent are equipped with a portable device with mobile internet access. The use of emails has become particularly commonplace. Workers receive an average of 18 e-mails per day, and many receive even more (Hampe, 2014). These developments evoke fundamental changes: Employees spend a large portion of their workday processing e-mails and searching the internet. Primarily however, information technologies provide the basis for the spatial and temporal removal of the boundaries between work and leisure. Internet and mobile devices allow for flexible, space- and time-independent forms of work within (as well as outside of) the company and thus facilitate permanent connectivity.

Although new information and communication technologies are often used with the objectives of saving labour, increasing effectiveness and process control (Pfeiffer, 2010), the ambivalent consequences have been discussed in occupational and industrial psychology for decades. The use of technology in everyday work thus oscillates between restricting and enabling autonomy and creativity. Flexwork allows us to work from home, on the train, in hotel rooms, in coffee shops, after office hours, on weekends and on holidays. Work related e-mails and tasks can be accessed «always» and «everywhere». Frequently, «working from home, instead of the office» is being replaced by «working from home, as well as the office» – a creeping consequence of constant connectivity.

Positive effects can include an improvement of work-life balance, reduced time spent commuting, as well as increased flexibility with regards to organising everyday life. At the same time, this flexibility demands a high degree of self-organisation and is often accompanied by a substantial increase in daily working hours. Respondents named location-independent work, increased connectivity with key stakeholders, as well as work-life balance as the main advantages of permanent connectivity (see table 19).

Table 19: Advantages of constant connectivity (cross-functional)

- Location-independent work
- Simplified and fast information exchange
- Increased interconnectedness (internal / external / global)
- Individual determination of when to retrieve information
- Learning self-regulation / self-management with regard to connectivity
- Consideration of employees' various backgrounds (e.g. age)
- Work-life balance

7.2. Risks

According to the IAP Study «Human Factors and the Future of Work», the risks of constant connectivity include: increasing dissolution of boundaries between work and leisure, not being able to relax, perceived increase of stress levels in the face of constant connectivity (incl. the need to evaluate the urgency of a request), and fear of missing out on essential information (see table 20). A majority of the interviewed people still consider constant connectivity to be a learning field for themselves and their employees.

Table 20: Disadvantages and risks of constant connectivity (cross-functional)

- Increased dissolution of boundaries between work and leisure
- Not being able to relax – burnout risk
- Increased stress levels, due to high expectations regarding the speed of processing requests
- Increased «risk of addiction» regarding the collection of information
- Dealing with constant connectivity as an evolving learning field

7.3. Health Effects

The reported increasing workload can certainly not be attributed to technology alone. The results from our interviews confirm once more that labour intensity, as well as deadline and work pressures, are fundamental features of the changing work environment. Thanks to the internet and mobile forms of communication, the amount of information to be processed has increased and communication has become faster. The increasing number of communication channels and chat functions during and outside of working hours can lead to a potential «media overload» (Ruchhöft, 2012). Constant availability promotes interruptions to the workflow and demands increased multitasking skills. Interviewees in this study speak of health effects caused by constant availability (see table 21). Half of the respondents have not experienced health issues, while other specialists and executive staff report lack of sleep or a decrease in the quality of their sleep, as well as psychological stress.

Table 21: Subjective health effects caused by constant connectivity (cross-functional)

- None
- Lack of sleep
- Insufficient recovery during holidays due to digital availability
- Psychological stress in the face of expectations of constant connectivity, restlessness
- Holiday as a necessary break (including shutting off, protection from burnout)

7.4. Organisational Measures

Despite the emergence of new collaboration technologies, such as social networks and cloud collaborations, e-mail remains the most widely used medium for business communication. The emergence of mobile technologies, both in the workplace and at home, has further promoted the use of e-mail. The negative aspects of the growing use of e-mail is widely discussed in science and practice. Studies show that e-mail overload can reduce people's creativity and their quality of life (Zeldes et al, 2007), as well as cause emotional exhaustion (Brown et al., 2014). Health management within companies has thus increasingly focused on the rising burden of e-mail communication. Out of concern for their employees, Daimler and Volkswagen have implemented restrictive technical measures to curb e-mail overload. Daimler offered the option of instantly deleting incoming emails during holidays. In the present study, the majority of respondents reported not to have implemented any comparable organisational regulatory measures. Instead, they rely on people's own responsibility and on teaching their employees how to appropriately deal with connectivity. Managers need to communicate their expectations in terms of constant connectivity in a transparent way (see table 22).

Table 22: Organisational measures in dealing with permanent connectivity (cross-functional)

- None
- Emphasis on employees' personal responsibility
- Executives acting as role models
- Coaching employees in how to appropriately deal with constant connectivity, within the framework of BGM measures
- Addressing phases of increased workload in team meetings

7.5. Personal Strategies

Finally, the surveyed experts and executives described their personal strategies for dealing with constant connectivity. They interviewees emphasise, among other things, the importance of self- and work management, specification of personal unavailability, as well as pushing health-promoting strategies, such as sufficient exercise and healthy eating (see table 23).

Table 23: Personal strategies for dealing with constant connectivity (cross-functional)

- Transparent communication of personal availability
- Self- and work management
- Determining your personal availability
- Tolerating «off-phases» in corporate culture
- Banning mobile phones from the bedroom
- No processing of business emails in your free time
- No processing of business emails at the beginning of the day
- Influencing expectations by extending response time
- Resilience, sufficient exercise, balanced diet and a positive mindset
- Conscious use of digital detox

«We grew up as a digital company.»

Marc Maurer
COO
On

Marc Maurer is COO of On. Before joining the Swiss start-up company for performance running shoes, he was a consultant at McKinsey. Marc Maurer studied in Winterthur and holds an IN-SEAD MBA.

How does the company deal with digitalisation? We‘ve been around since 2010, which means we actually grew up as a digital company. We offer an online store and a digital customer experience, which in turn is part of our digital marketing. The orders run digitally: from the web directly to the warehouse. We work with digital project management tools, digitised HR processes, and internal communication and evaluation tools. Every process is at least partially affected by digitalisation.

How do you, as COO, strategically approach digitalisation? First, we try to cover all business processes in which a human being cannot generate any added value digitally. This means that when you work for On, we want you to spend your time doing things that add value (e.g. advising customers on the phone about picking the right shoes). We do not want you to enter orders into the system and send them to the warehouse as this can be done digitally. Secondly, we try to use digital elements, such as project management tools to increase efficiency and so people are able to work with more transparency, agility and sustainability. Thirdly, we use digital elements to improve customer experience. When you buy a shoe from us, you can upload a web-profile, telling us how much and when you run. You receive a surprise on your birthday. When ordering online, you can track your parcel through Facebook Messenger. Digital tools are the basis on which our data analysis rests and which we work with.

How do you evaluate the human-machine interaction? Inter-personal relationships will remain important for us. There will be an increased need for coaching in order to help people get acquainted with the digital world. However, I do not want to teach employees how to pack an order, instead I want to teach them how to satisfy customers. Will I need less people for this? No, instead we will use manpower to generate more value. It would be impossible to deal with this growth without making our processes more efficient. Over the next 6 to 12 months, we will hire another 70 to 80 employees, despite the fact that we are a very digital company. Digitalisation gives us competitive advances that allow us to grow and hire more people.

«As a leader, you have to help employees set priorities.»

How has leadership changed? I grew up in the digital world, thus my leadership has not changed at all. Sometimes we have to coach people on how to be more efficient. Many are distracted, especially the younger generation: WhatsApp, Facebook Messenger, e-mail, 20 minutes news. Your work is interrupted every 30 seconds by irrelevant messages and news. Many people are no longer able to solely focus on one topic over a period of time. Instead, everything is moving so fast; one is being chased rather than being the chaser. As a leader, it is pivotal to help employees set priorities. There are so many possibilities opening up. You have to be able to say «no» and say: «these are the five things that we are doing; the remaining five are also great, but for now we are only doing the first five.»

Does digitalisation facilitate international leadership? I have many communication channels to choose from, which make real-time global leadership much easier. People are able to see me, and I can share different topics with them. We are active in over 50 countries, which is why I am somewhat present in Tokyo, in Vietnam, and in the USA at the same time. I do not always have to be on site since I see my employees digitally and we can discuss new topics this way. Of course, it is more pleasant to discuss difficult topics in person, but it is possible to do it differently – for instance, sharing screens in order to explain something. This makes things a lot easier for me. Thanks to digital media, I can communicate a lot better across the globe than would have been possible over the phone.

But that also means that you have to be available globally around the clock? It certainly takes a lot of time, because you are always available to everyone, and they can call you any time. Considering the time difference, your day begins when it starts in Japan and it ends when it stops in the USA. You are reachable 24 hours, so to speak. I see my job as being a coach: in order for you to be a good coach, you have to know what it is all about and understand your employees. That requires a lot of time and commitment.

Are time and commitment the big challenges of your role as a leader? Yes, time, commitment and prioritisation are very important for every employee. To be able to maintain an interpersonal relationship is a big challenge. Digital tools are extremely useful for international exchange; but at the same time, I sometimes see two people, sitting side by side, sending each other messages via Slack. I see it as a challenge, to maintain the ability to communicate. I have a huge range of digital natives and a 50-year-old sales director, who need to communicate with each other - they are like Mars and Venus. I consider building a bridge between the two extremely important.

Where do you see the opportunities and challenges of advancing digital change at On? We see a big opportunity for us, being a young company. Compared to larger companies, we do not have a legacy and are thus able to use new tools efficiently, and thereby gain a competitive advantage. We will make huge steps with the Internet of Things, as far as the end customer is concerned. In ten years, I will be able to tell a customer with the interconnected running shoe: You have now run 500km with your shoe, but by putting a lot of pressure on the heel, you have now worn out the absorption – it is time for a new one. And we will be able to deliver it in real time. We see this as an opportunity and not as a problem.

«I have a huge range of digital natives and a 50-year-old sales director, who need to communicate with each other – they are like Mars and Venus. I consider building a bridge between the two extremely important.»

Could customers see this as a problem? We have to give people the opportunity to decide: I want you to be my running coach and tell me what to do every day, and for everyone to see. Or: I do not want anything to do with you, this is my product, leave me alone, I want to be alone in the woods.

What are the advantages and disadvantages of constant digital connectivity? If one is able to organise themselves and say «Right now I am off, and now I am on» then I see many advantages because he or she can work independently. The big disadvantage, however, is that I cannot turn off and that I am «on» around the clock. This also has extremely negative health effects. I encounter many people who are constantly looking at their mobile phones. This requires a lot of coaching.

How do you manage personally? I go on holiday for a few weeks, during which time I am not available. Otherwise, I divide my day into blocks and take two hours to work on a problem. During this period, I turn off e-mail, otherwise it would interrupt me constantly. I am trying to use as few tools as possible. On Facebook, there is nothing for me to do, and I do not care about Facebook Messenger. I do not receive push messages of any kind. If I want to see something, I will go on there for a minute. Six to eight o'clock is family time. In the morning, I usually work on requests from Asia first. At five I go on a run for an hour, because I know that at nine I will have to speak to the USA for another hour.

8. Summary – Futur Challenges in the Workplace 4.0

The changes in the future working world and humans' role in this is characterised by a fundamental ambivalence. Starting with the understanding of digitalisation, this report reflects the heterogeneity among the interviewees. On the one hand, the surveyed specialists and executives speak of fundamental changes, which require carefully designed change processes. Technology experts, on the other hand, emphasise that industry 4.0 does not represent a revolution per se and does not introduce substantial innovations, but instead uses technology for the further development of business models. Increasing automation of work and production processes should not stand in the way of the individualisation and diversity of customers' wishes. Increasing interconnectedness, as well as the use of big data, will increase compliance and standardisation within organisations. Leaders and L&D experts are increasingly required to offer individual career advice or customised support. Although the interviewees speak of the increasing importance of interdisciplinary work, collaborative knowledge sharing and having a culture in which mistakes are dealt with constructively, in reality they are confronted with corporate cultures that promote individual achievement and competitive pressure.

Dealing with these often contradictory characteristics of tomorrow‘s working world is challenging and requires, as noted in the majority of interviews, openness, curiosity and willingness to change on behalf of all parties involved.

A key finding of the study is participants' conviction that digitalisation does not entail widespread job losses. Since the use of new technologies through automation measures has already lead to encreased productivity and market opportunities for new services and products in the workplace, respondents have not mentioned a negative impact on overall employment. This result is consistent with other research and practical reports (including Hammermann & Stettes, 2015). However, the interviewed experts expect a significant structural change: generally, the demand for IT professionals and highly skilled workers is expected to increase, while jobs in manufacturing, logistics, administration and customer service will be most affected by restructuring. Thus, there is a consensus that a strategic change of direction, in the face of digitalisation, involves defining future skills and competencies, as well as establishing necessary training and further education measures for the affected occupational groups. The need for lifelong learning, and sustained willingness to develop one‘s own skills, are a prerequisite for a successful digital change. In this field, the surveyed experts and executives increasingly expect their co-workers to become more self-reliant with regard to self-organisation. Executives of the future, in their roles as facilitators and coaches, are to set up the fast-paced digital change in such a way that everyone understands the complexity and often contradictory information of current working practices. The HRM of tomorrow will be an essential companion during the digital transformation and thus turns into an agent of change. Learning within companies is becoming increasingly interdisciplinary, cross departmental and takes place within work and learning networks (cf. Becker, 2015). The role of senior technology managers or chief digital officers consists of shaping cultural change and of coordinating the digital (as well as organisational) change concerning the operational business, the customer and the products.

The future working world is an interdisciplinary and complex project, which must be viewed in its entirety and from different perspectives. In addition to the important role of technology in a growing information society, the aspects that still require education and further training on are: the communication between man and machine, communication between people (whether physical or virtual), and collaborative interdisciplinary work and learning forms. Technological innovations should not be perceived as a deterministic ambition. The human factor is a central figure in the creation of digital change, thus opening up new rooms for manoeuvre and opportunities for designing the future.

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