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**IAP
Institute of Applied
Psychology**

IAP Study 2017 – Part 1

Human Factors and the Future of Work

Results of the Quantitative Survey

Imprint

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1. Human Factors and the Future of Work

Digitalisation marks the 'new' working world. New technologies, agile forms of working, mobile and flexible workplaces, as well as other developments, influence how and where we will work in the future. The internet is further changing our notions of work and the role of the human factor in the economy. This study focuses on people in the workplace 4.0. The Institute of Applied Psychology (IAP) has interviewed more than 600 Swiss specialists and executive staff about how they experience the changes in the new working world, and to what extent digitalisation has expanded into their daily routine. Since 2011, "4.0" is shorthand for the revolution of the digital transformation (Kagermann & Lukas, 2011). The world of work represents work processes in the current fourth industrial revolution. This includes the possibility of gathering, linking, analysing and optimising data about beforehand unseen parts of our living and working environments by the means of mobile internet and 'the Internet of Things'. This creates new work processes, business models, organisational structures, whole new professions and requirements for the roles of the employees.

What does 4.0 stand for?

4.0 stands for the fourth industrial revolution, which, through the use of mobile internet and 'the Internet of Things' with web-enabled devices, leads to an increasingly flexible, mobile and interlinked work process.
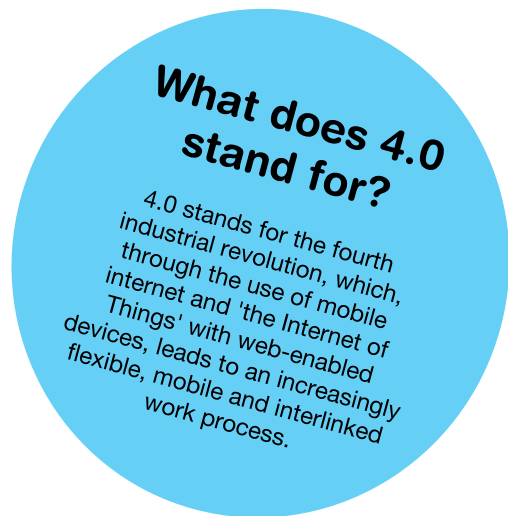
IAP has interviewed experts and executive staff in Switzerland

- Survey period: December 2016 - January 2017
- Number of respondents: N = 629
- One-third in SME, two thirds in large companies
- One-third performs human resources functions
- 1 in 10 respondents are self-employed
- Two thirds of the participants hold managerial functions
- 7 out of 10 hold, at least, a polytechnic degree
- Gender: 45% ♂ 55% ♀
- Average age: 45 years

But how does a successful digital transformation succeed within an organisation? There are already numerous trend reports on the topic of digitalisation. Consulting firms offer advice on how to achieve new business models, economic growth and efficiency improvement with the help of digital transformation, artificial intelligence and big data. Existing studies on digital transformation generally bet on technological investments to promote innovation and thus make far-reaching predictions. Furthermore, the media warns of potentially large job losses due to the digital transformation.

Focusing on the people in the digitalised working world, this numbers-based study offers a differentiated assessment of the working world 4.0. At the end of the day, what affects the future success of companies and organisations is the interaction between the human factor and machines.

2. Digital Transformation

Media reports and studies titled 'digital transformation' or 'digitalisation', first and foremost talk about new business models and the digital economy's technological aspects, often using a diffuse notion of digitalisation.

It is pointed out in the literature that 'digitalisation', on its own, does not exist (Passig & Scholz, 2015; Weitekamp, 2016). Since the 1940s, computers have ceased to be analogue and the digitalisation of computational processes has taken place in the financial sector from the 1960s onwards. Commencing in the the 1970s, law enforcement units and hospitals, for instance, started using digital databases. At that time, these processes were more commonly called 'automation' and 'computerisation'. It was not until the 1990s that the term 'digitalisation' became more common and, according to the German digital experts Passig and Scholz, it started being used in its 'current vague meaning' only from 2010 onwards. The two scholars advise to define the term digitalisation prior to using it in any context (Passig & Scholz, 2015).
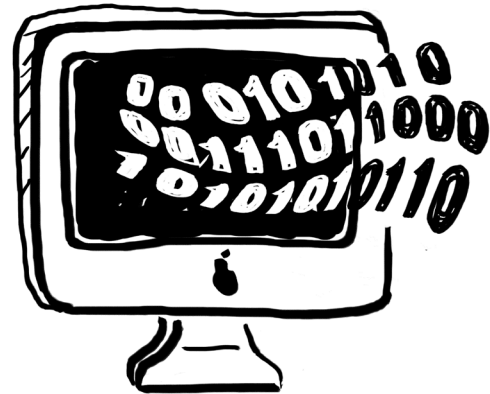
Most respondents understand digital transformation to signify work processes and content are becoming increasingly digital. However, there is no unified understanding of the term. For some, digitalisation means acceleration, for others, more mobile or flexible work forms, or even completely paperless ones. Still others think of social media, industry 4.0, big data, robotics, or artificial intelligence.

Therefore, the first question in the IAP Study was an open one: 'How do you understand the phrase 'digitalisation of the working world?' Respondents described what they understood by the term in their own words. Our team received more than 1,600 entries, which they grouped and enumerated thematically. As expected, respondents showed a heterogeneous understanding of the term (Figure 1 – Different understandings of digital transformation).

Most respondents define the term digitalisation to signify that work processes and content are becoming increasingly digital. For some, digitalisation means acceleration, for others more mobile or flexible work forms, or even completely working paperless. Still others think of social media, industry 4.0, big data, robotics, or artificial intelligence. Furthermore, some respondents mentioned e-recruiting, e-learning, overabundant data, surveillance, as well as self-service as being part of the concept of digitalisation. Entries about the possibility of always being online were filed in the category 'always on'.
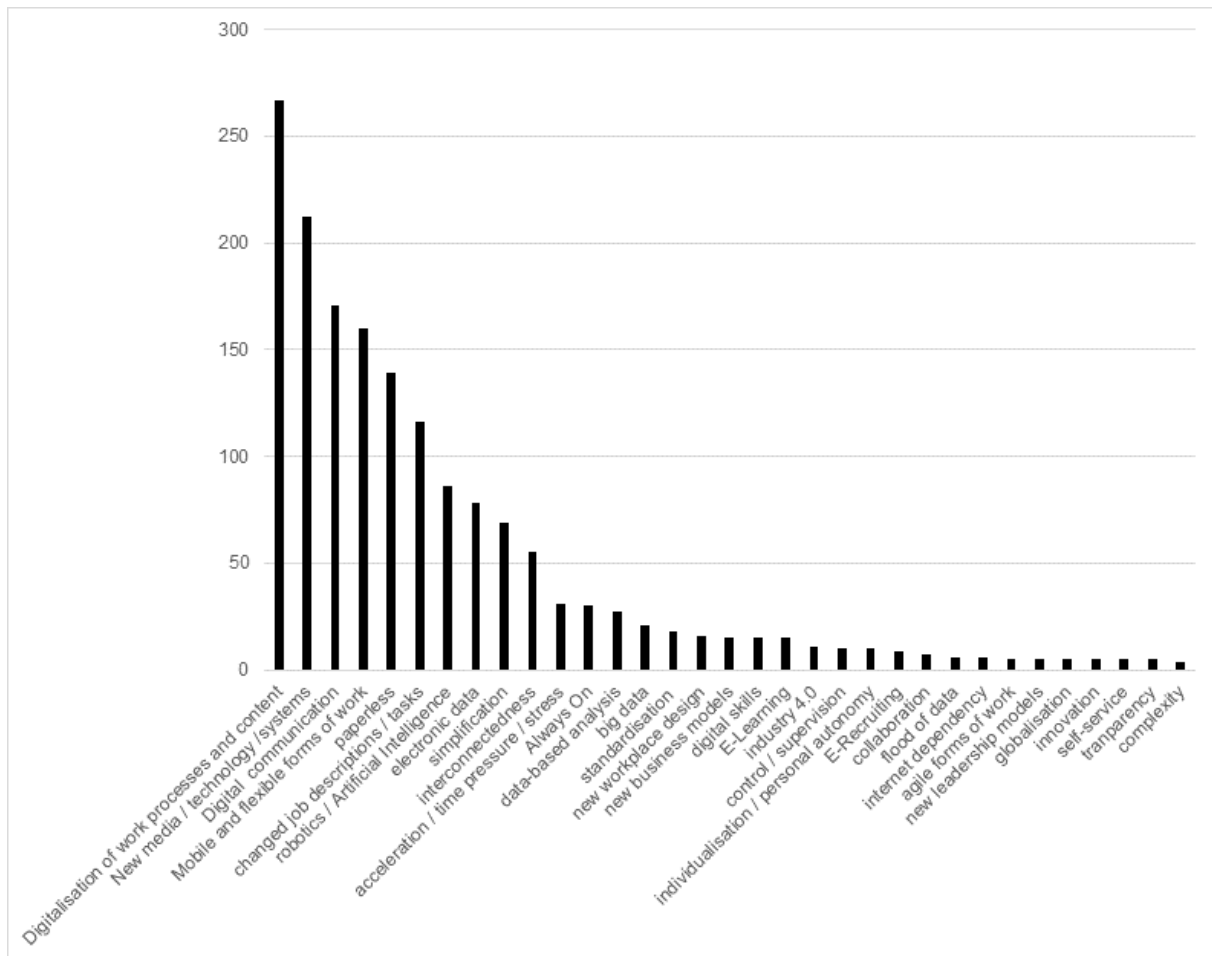
Figure 1 - Different understandings of digital transformation

In the present IAP Study we understand digitalisation of the working world and workplace 4.0 as those changes and processes that are mainly set in motion by the increased mobility of internet access and the 'Internet of Things'. A German government program defines work 4.0 as 'increasingly flexible, digital and intertwined' (Federal Ministry of Labour and Social Affairs Germany, 2015). For most questions in the IAP Study, the term is used more specifically depending on the aspects under scrutiny. When the term 'digitalisation' is used in a generic way, it usually refers to respondents' understanding of the concept.

How organisations are dealing with digitalisation so far

In a next question, participants were asked to specify what kind of digitalisation was already implemented within their organisations (Figure 2 - How organisations are dealing with digitalisation so far). For this question, categories were provided with multiple answers possible. Automation and digitalisation of work processes were those categories most frequently ticked, followed by mobile and

flexible forms of work as well as customer communication. In order to exclude e-mail as an already widespread digital form of communication with customers, the word 'social media' was added in parentheses to the latter category. Around half of the respondents work in an organisation where digital media is applied for personnel recruitment. Robotics and artificial intelligence as well as agile working methods are addressed in but a small number of companies.
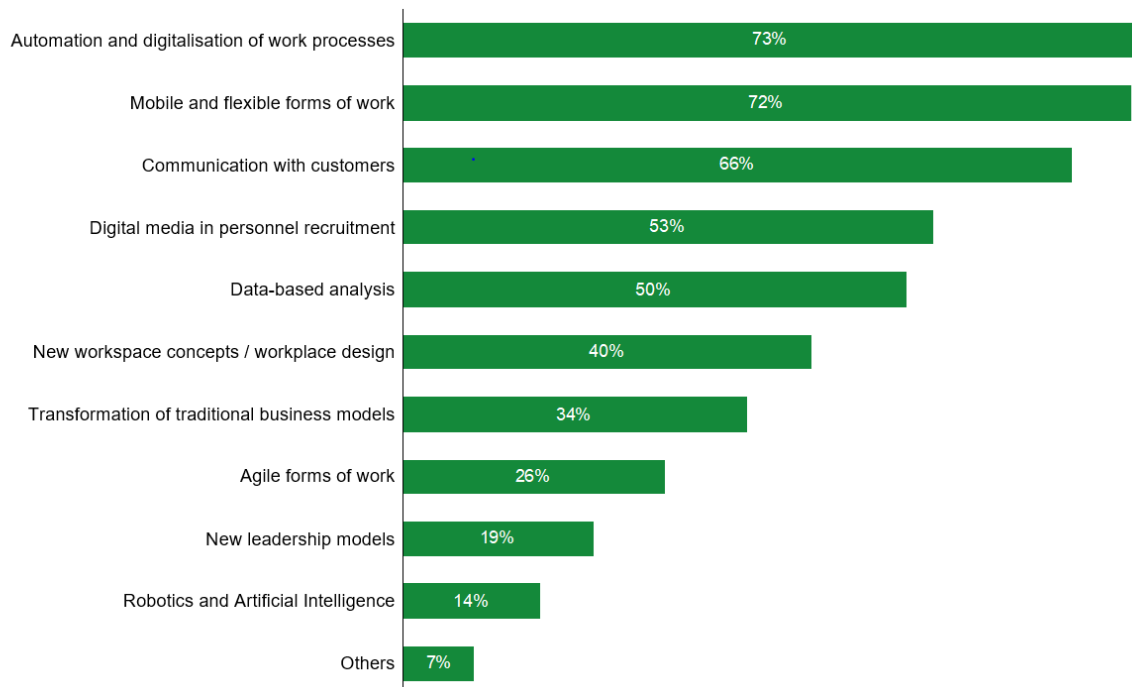

Figure 2 - How organisations are dealing with digitalisation so far.

Experts and executive staff's experiences with digitalisation

Being asked about digitalisation in general, most respondents answered positively to the changes caused by it. A more differentiated picture becomes apparent once respondents are asked about the different aspects of digitalisation. The possibilities granted by mobile and flexible work forms are perceived as positive throughout. Furthermore, most respondents assess changes in the areas of job profiles, implementation of business models, and the acquisition of digital skills positively or at least as balanced. The relatively high percentage of respondents assessing the changes as 'balanced', however, suggests that some experience a dilemma between advantages and disadvantages of the changes mentioned above. A discrepancy in respondents' assessment of the accelerated work pace points in the same direction: A fast pace of work can be perceived as productive and satisfying by

The majority of respondents experiences the changes to the workplace, caused by digitalisation, as rather positive. However, to many of them they also pose a dilemma.

some, whereas in others, it might cause stress and time pressure. In light of numerous media reports on job losses due to digitalisation, it is no surprise that job security was seen as rather negatively.
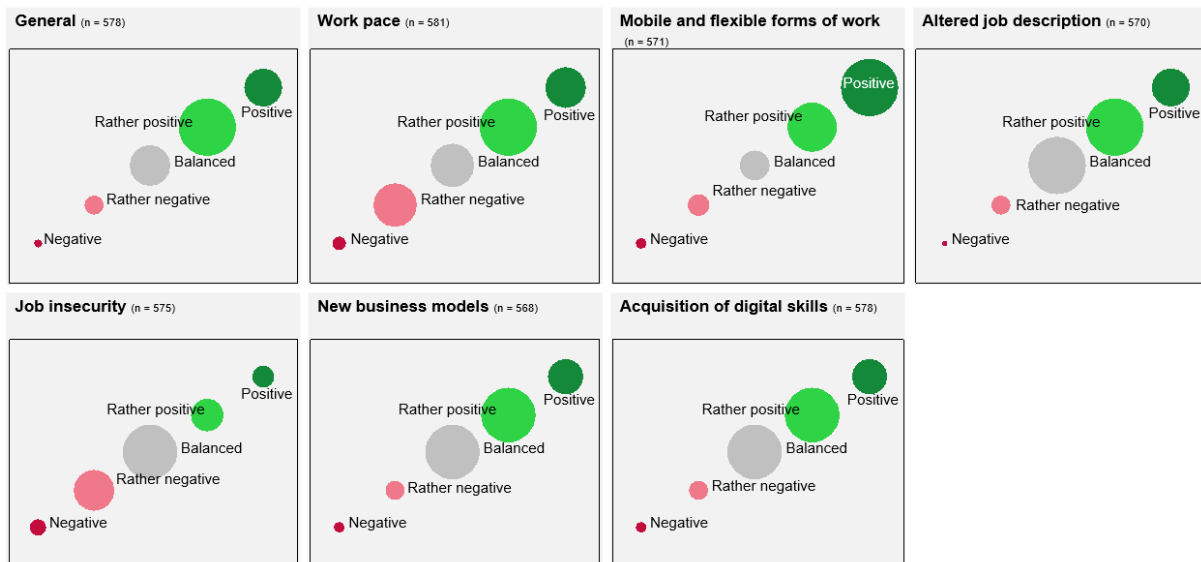

Figure 3 - **How do you individually experience the changes caused by digitalisation?**

A more detailed data analysis shows slight tendencies concerning age, gender, management level, position and field. However, these results should be interpreted with caution, since sub categories such as age groups vary in size and generally do not exhibit standard distribution. For this reason, a complete sub-group-analysis based on the socio-demographic variables mentioned above has only been conducted for the general assessment of digitalisation. With regards to the other questions, striking differences in sub-groups are selectively highlighted below.

There is a tendency amongst younger respondents to assess changes caused by digitalisation more positively than their older counterparts. Amongst those under 30, nine out of ten perceived change generally as positive, whereas merely two-thirds of those over 45 said the same. A third of those in the age group between 45 and 65, however, assessed the change as either negative or positive. It is possible that the changes in the work environment caused by digital transformation, are less tangible for those under 30, whereas older employees are able to evaluate the advantages and disadvantages more critically, thanks to their years of experience. Furthermore, the accelerated work pace is rated more positively amongst younger respondents. Another age-related tendency becomes visible when looking at mobile and flexible work forms as a result of digitalisation. Young respondents assess temporally and spatially flexible work as slightly more positive. However, this aspect remains one of the most positively experienced aspects of digital transformation in the workplace amongst all age groups.

There are no significant differences regarding gender. Only concerning acquiring digital skills, male respondents assessed the changes as slightly more positive than their female counterparts. Likewise, among execuitves, there are hardly any statistical differences. Lower management levels generally assess the acceleration in the work pace as less positive than respondents in middle and higher

management positions. Respondents of different areas of operation rate the changes caused by digitalisation differently. On average, 70 per cent of respondents working in human resource and training management rate the changes as positive. The same is true for respondents from the field of business? development. Respondents from the field of production and distribution rate the digital transformation of the working world in general as outstandingly positive. Likewise, those from the areas of marketing and communication as well as IT evaluate the changes as surpassingly positive. Those employed in the field of finance and controlling, on the other hand, experience the changes less positively, with some even experiencing dilemmas. Looking at the issue of job security, statistical differences according to position become apparent: A close third of the respondents evaluates job security in relation to digitalisation as negative. The following functional groups lie within this average: production, human resources and training management, IT. The following function groups evaluate job security as outstandingly negative: distribution, finance and controlling. The function groups development and marketing and communication similarly view job security rather negatively. Differences in the field manifest themselves for respondents from the field of communication who view general changes most positively and those from finance, education and research and the public sector who are more sceptical.

In this study, we asked about the classical aspects of job dissatisfaction in relation to the changes caused by digitalisation (Figure 4 – Changes caused by digitalisation…). Around three-fourths of the participants state that, thanks to these changes, their work has become more varied and that they are granted more autonomy. A close majority states that digitalisation has rendered their work easier. However, it is but a minority that feels happier due to the changes caused by digitalisation.
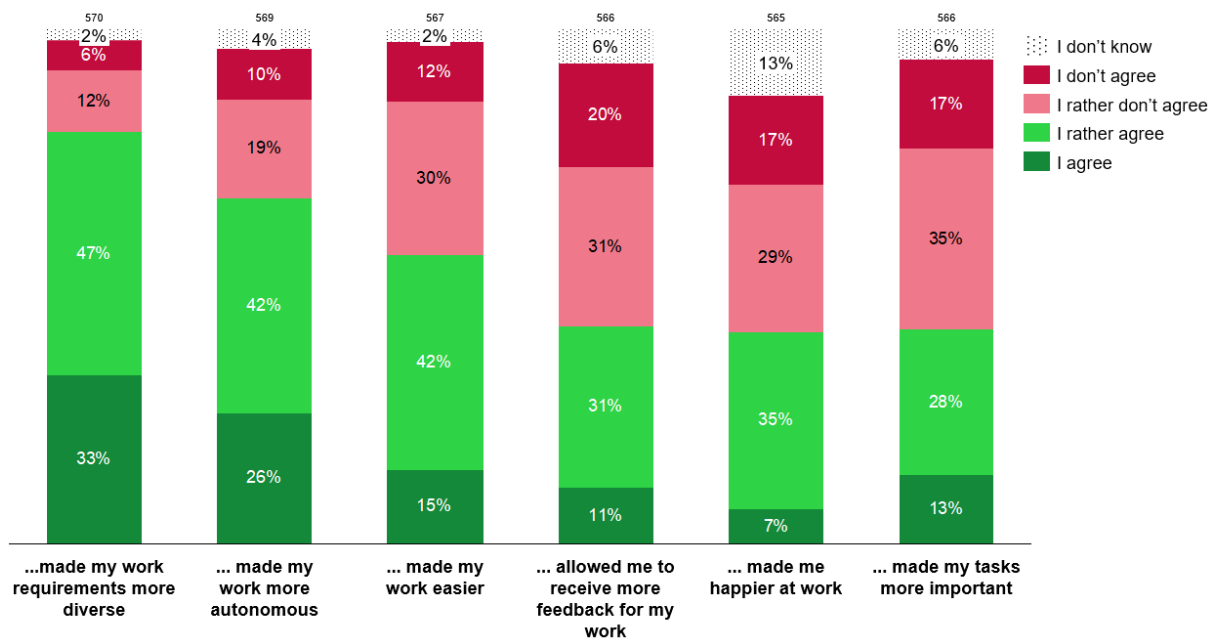

Figure 4 - Changes caused by digitalisation…

Humans and machines

The fear that the basis of living could be replaced by machines is not a modern phenomenon specific to the fourth industrial revolution. As industrialisation took its course at the start of the 19th century, a wave of protest erupted in England due to the looming social hardship caused by job losses in the textile industry. In Switzerland, this tendency culminated in the so-called 'Maschinensturm' in Uster in the Canton of Zurich, when textile outworkers set fire to a mechanical spinning and weaving mill in 1832 out of fear of losing their livelihoods. Even then, punch cards that worked on the digital principle of the binary system (zeros and ones) were used to operate weaving looms (Schneider 2007). Strictly speaking, digitalisation has already begun about 200 years ago.

Numerous publications in the 21st century warn of job losses resulting from the digital transformation, especially the much-cited study by Frey and Osborne from the year 2013. For their study, 'The Future of Employment', the two scientists from Oxford assessed based on statistical models? which jobs and job profiles of the US economy are most at risk from digitalisation and automation. According to their estimates, 47 per cent of jobs in the US are at risk of being 'digitalised away'. They further calculated that the level of education negatively correlates with that risk: Those with a high level of education run a significantly lower risk of losing their jobs due to digital transformation (Frey & Osborne, 2013).

> **The fear that human labour could be replaced by machines is not a phenomenon of the future of work, but a recurring motif in economic history.**

The media have used the shocking figure of 47 per cent job loss risk to make headlines. However, their calculations only referred to current jobs, whereas new jobs created by the digital economy's new business models were not taken into account. This issue is also highlighted by Autor (2015) in his article 'Why Are There Still So Many Jobs? The History and Future of Workplace Automation'. Although he points out that automation actually has replaced workers, as was the intention, he also shows that historically automation has created a new demand for labour, led to higher productivity, higher wages and additional demand for workers. In addition, the text shows that the issue of substitution of human labour by machines is often wrongly assessed by traditional media and experts for they ignore the relationships between automation and increased demand for new labour. However, he states that a polarisation has taken place since the benefits? are very unevenly distributed among the workers. Finally, Autor (2015) notes that problem solving, adaptability, and creativity represent increasingly important skills in the digital age.

The participants in the IAP Study were asked to indicate how likely they assess the risk that parts of their current jobs will be replaced by machines in the future. More than three-fourths think that this will not be the case (Figure 5 - How likely do you think the possibility that parts of your current job will be replaced by machines in the future?). This does not come as a surprise, since automation and digitalisation will mainly affect people with low levels of education (Frey and Osborne, 2013), an above-average educated sample (70 per cent of respondents have at least a polytechnic degree) has participated in this study. A more detailed analysis by education level within the sample of the present study shows no statistical correlation between the highest level of education and the estimated risk that parts of the current job will be replaced by machines in the future. Actually, those who have graduated from apprenticeship training without an academic degree tend to be more confident that they will not be replaced by machines than those with a university degree. This might be due to the

internationally acclaimed dual education system in Switzerland, which enables graduates from apprenticeship trainings to lead solid and successful professional careers with a low automation potential.
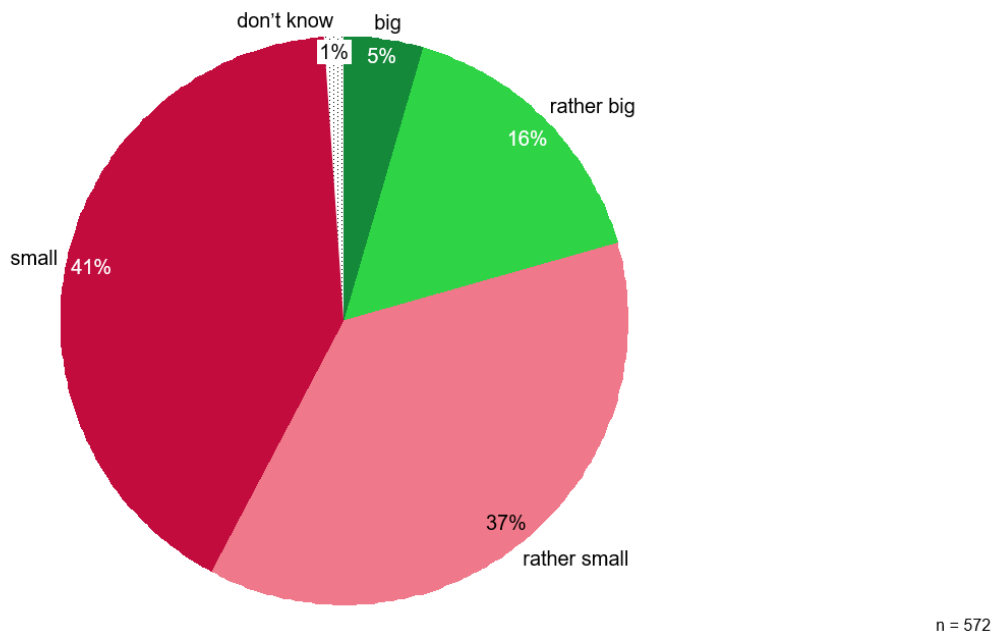

Figure 5 - How likely do you think the possibility that parts of your current job are replaced by machines in the future?

The Swiss researchers Willimann and Käppeli have recalculated the Frey / Osborne study for the Swiss labour market. They came to the conclusion that even in Switzerland half of the jobs are at risk by digitalisation (Willi Mann & Käppeli, 2017). The authors further estimate that in Switzerland jobs in the country side are more at risk than those in urban areas, where a greater number of well-educated professionals live. Yet, analogous to Autor (2015), they put this into perspective: On the one hand, not every job that can be automated will actually be automated, and on the other hand, the Frey / Osborne study exclusively refers to current job descriptions and not to those potentially created by digitalisation. A similar argument is made in a German study which has recalculated the Frey / Osborne study for the German labour market on behalf of the Federal Ministry of Labour and Social Affairs (Bonin, Gregory, & Zierahn, 2015). Despite numerous predictions about job losses caused by digital transformation, there are few actual estimates. Bonin et al. (2015) came to the conclusion that when referring to the Frey / Osborne approach, 42 per cent of employees in Germany currently work in occupations with an automation probability of over 70 percent. However, they claim that Frey and Osborne overestimated the technical potential for automation of professions or jobs, because their results are based on expert assessments, which typically lead to an overestimation of technical potentials.

Bonin et al. (2015) followed a different approach than Frey and Osborne: instead of examining entire job descriptions, they have examined automation probabilities in Germany based on job structures in the workplace. By doing so they estimate that only 12 per cent of jobs in Germany with a work profile run a relatively high risk of being automated. However, they also believe that automation probability for low-skilled and low-paid workers will be relatively high. Nonetheless, Bonin et al. (2015) do not see the complete economic employment inevitably compromised by this, particularly if lifelong learning opportunities are promoted.

Such a shift of economic sectors has happened before in the context of previous mechanisation and electrification waves. 200 years ago, 60 per cent of all workers were employed in agriculture - today, this number has shrunk to 3 per cent. On the other hand, back then only 10 per cent were employed in the service industry, whereas today this group makes up 75 per cent (Städler, 2017).

3. Mobile and Flexible Workplace

Be it via home office, flexible working hours, or mobile working inside or outside of the organisation: mobile devices such as laptops and smartphones in combination with cloud solutions and VPN connections facilitate time- and location-independent working, and thus grant workers more autonomy. Consequently, the possibility to work independently with regards to space and time is one of the key aspects of the working environment 4.0, which has been experienced positively throughout, even if teleworking is not a novel phenomenon either (Godehardt, 1994).

75 per cent of respondents rate the opportunity to work in flexible and mobile forms positively or rather positively, whereas one-fifth experiences the advantages and disadvantages as balanced. Only 7 per cent perceive them negatively (Figure 6 - How do you experience flexible and mobile working (e.g. home office, mobile workstation within the organisation)?).
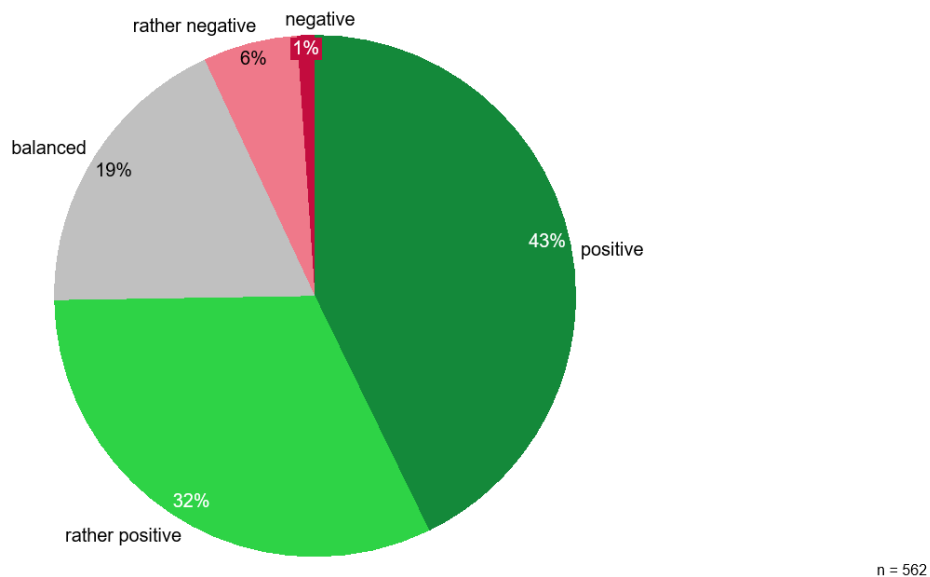

n = 562

Figure 6 - How do you experience flexible and mobile working (e.g. home office, mobile workstation within the organisation)?

For the IAP Study we asked about the opportunities organisations offer in this field (Figure 7 - Does your organisation facilitate mobile and flexible working?). Overall, 83 per cent of respondents are offered the possibility to work in mobile and flexible ways. Most frequently cited were home office followed by flexible

Three-fourths assess mobile and flexible forms of work positively.

working hours and annual working time. Less than half of the respondents have the opportunity for mobile work within their organisation, and nearly a quarter are able to use co-working spaces (i.e. open office space which is neither home office, nor an office within the premises of the organisation).
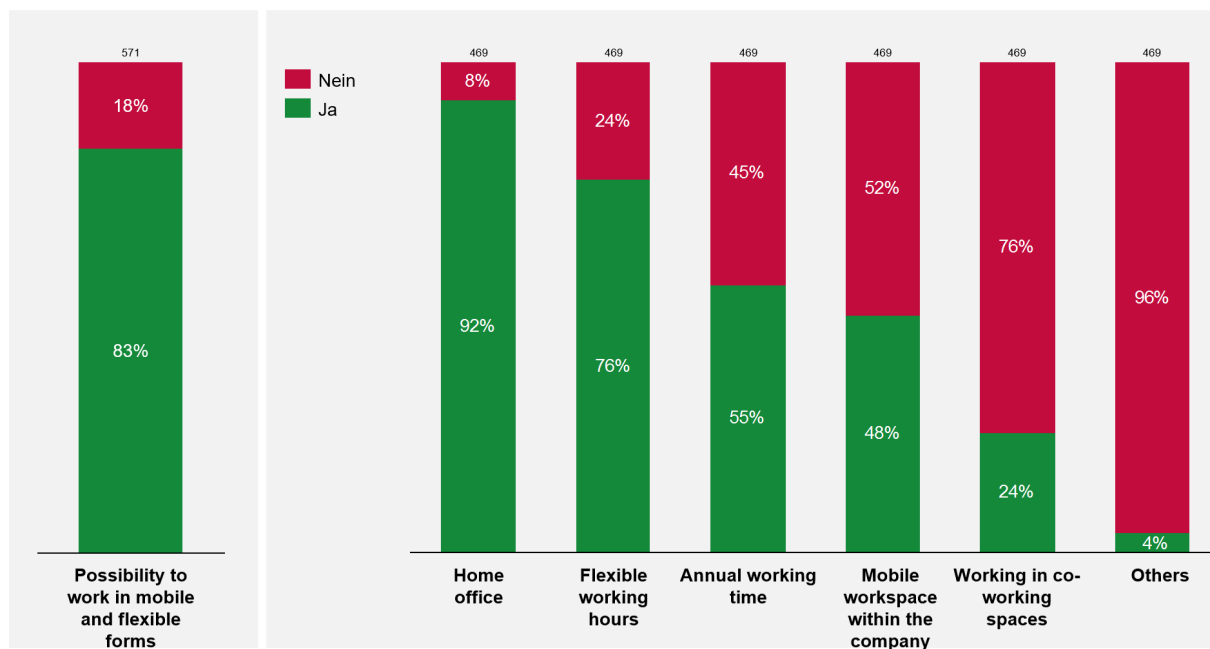

Figure 7 - Does your organisation facilitate mobile and flexible working?

As expected, the possibilities for mobile and flexible work also depend on a company's size (SMEs / large companies). By trend, it can be said that the larger the organisation, the more likely are the possibilities of mobile and flexible work forms (Figure 8 – Does your organisation facilitate mobile and flexible working? Measured by the organisation's size and number of employees).
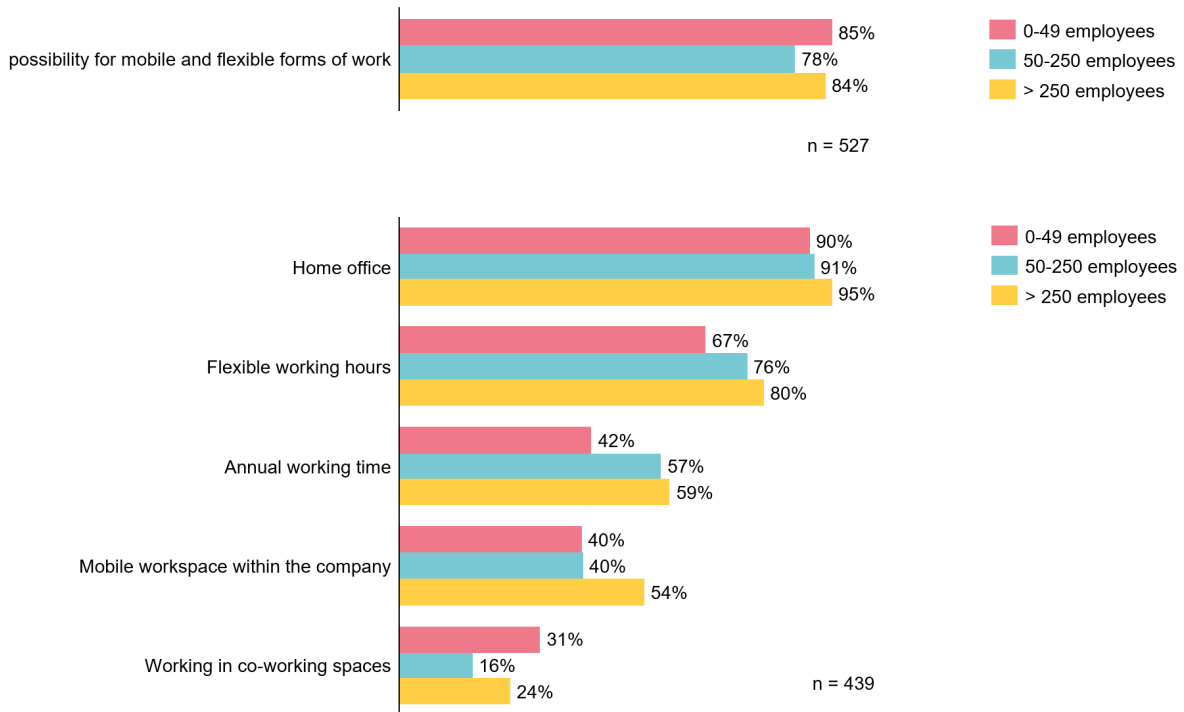
Figure 8 - Does your organisation facilitate mobile and flexible working? Measured by the organisation's size and number of employees

Regarding the amount of work and the working hours, the vast majority of respondents are autonomous and do not want their employer to regulate these more clearly (Figure 9 - Autonomy regarding labour and working hours). However, this result must be interpreted against the fact that two-thirds of the study's participants hold management positions and therefore have a higher degree of personal responsibility. The data furthermore shows a tendency for highly-trained personnel to have a slightly higher degree of autonomy than participants with lower levels of education. It is likely that there is a correlation between holding a management position, higherlevels of education and autonomy.
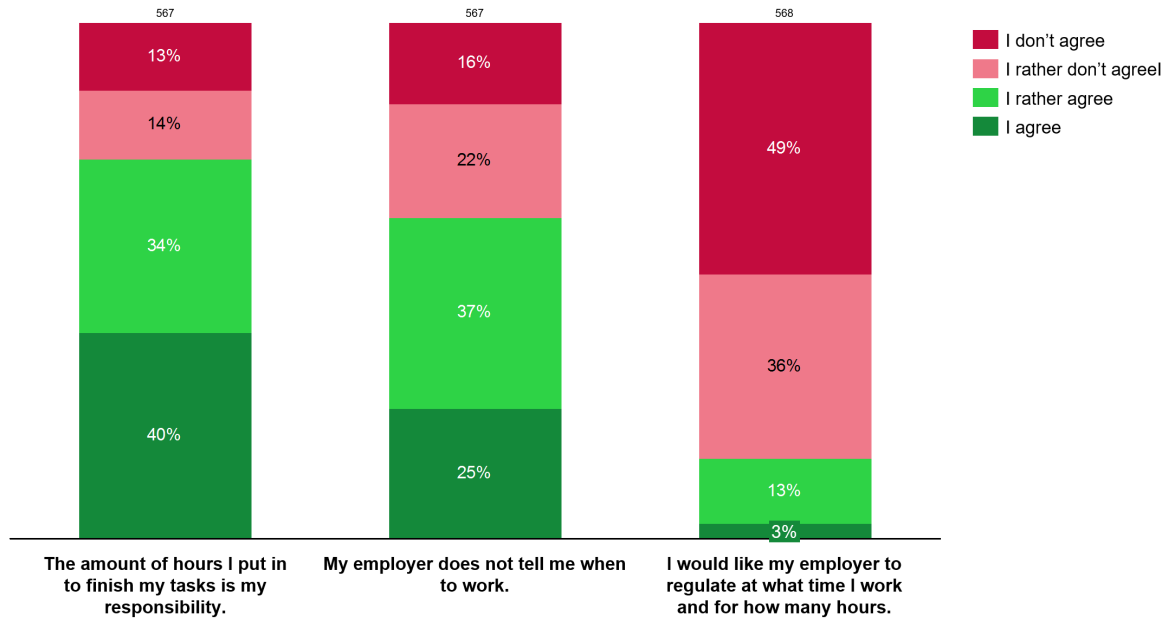
Figure 9 - Autonomy regarding labour and working hours

Personal workplace or FlexDesk

Mobile devices coupled with broadband internet not only allow for mobile working outside the organisation, they also cause many companies to discuss, or even introduce, FlexDesk solutions. This means that employees do not have a fixed workspace assigned to them, but can chose a workplace collectively shared within the organisation. This option contains several advantages such as the fact that, depending on the task, employees might move to more suitable work zones, e.g. a quiet zone to work by themselves, a meeting zone for meetings, or a telephone zone for phone calls. At the same time this allows the organisation to optimise the workspace, which is usually coupled with financial savings. However, different personality types react differently to the suspension of fixed workspaces. There is the assumption that FlexDesk solutions cater to the needs of extroverted employees more, whereas a certain proportion of employees struggle with losing their spatial 'home within the company' (Steck, 2017).

> **80 per cent have their personal workplace. But not for long, suggest 57 per cent.**

The IAP Study's results indicate that four-fifths of the respondents still have their own exclusive workspace (Figure 10 - Own workspace).
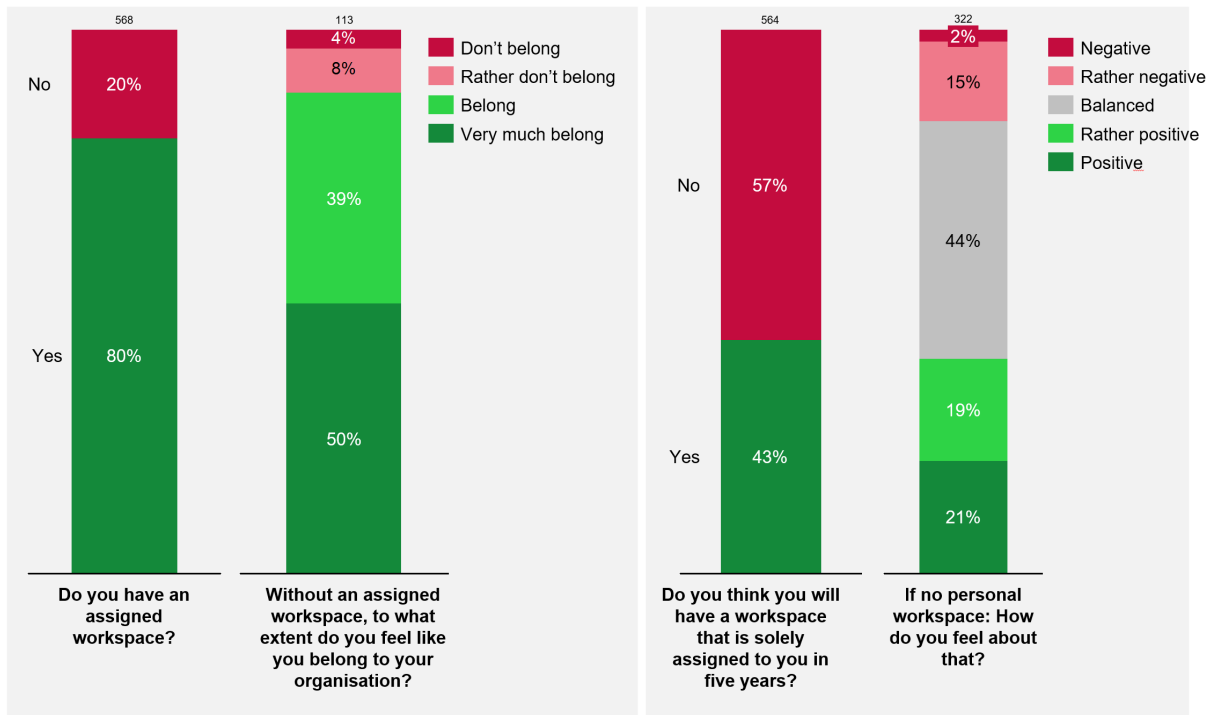
Figure 10 - Own workplace

Nonetheless, the fifth that has no fixed workspace still feel like they belong to the organisation overall. However, one person in ten loses his or her sense of belonging to thew company because of this. Particularly interesting is that, although 80 per cent still have their own workspace, 60 per cent believe that in five years this will no longer be the case. While 40 per cent consider this a positive development, the majority sees both advantages and disadvantages.

4. Leadership 4.0

How does digital transformation influence leadership? Will the principles for helpful leadership change completely or basically remain the same? Some authors, such as the Swiss digitalisation expert Cachelin, believe that digitalisation changes our work environment and employees' expectations of executives to such an extent that organisations should adapt their leadership culture (Cachelin, 2014). Other experts, on the other hand, point out that there are universal guiding leadership behaviours and traits, which, regardless of the times we live in, do not change: for example, that a manager should possess a certain charisma (eg Firlej & Kluz, 2016). Also the key factors that leaders are dealing with in shaping their environment and working efficiently with their team while having good self-leading skills remain stable. These include the competency to react and take into account the situation the team and the organisation is in, the general context the leader is facing and the specific situation he or she is in. Being able to perform situational leadership stays a crucial competency, even more so with the volatility and unpredictability of the future of work (Pfister, 2011).

The participants of the IAP Study were asked to evaluate in what way the leadership role has changed in the digital age. There was also the option to say that it has not, however, only 12 per cent of the respondents have answered accordingly. About half think the advent of the digital age will primarily ask employees to put a higher weight on their self-management skills and more leadership at a distance. A significant proportion of respondents note an increase in leadership through identification and goals. One third believes that participative leadership is currently on the rise. According to about 30 per cent of respondents, leadership is increasingly taking place via digital channels and hierarchies have become flatter (Figure 11 - To what extent has leadership changed in the digital age?).

More self-management	50%
More leadership at a distance	48%
More leadership through identification and goals	39%
More participative leadership	32%
More leadership through digital channels	31%
Flatter Hierarchien	30%
More leadership by peripheral employees (Freelancer / Crowdworker)	23%
Not at all	12%

n = 558

Figure 11 - To what extent has leadership changed in the digital age?

Particularly interesting are the more detailed analyses regarding the size of respondents' organisations (Figure 12 – To what extent has leadership changed in the digital age? According to organisation's size). While more than 50 per cent of participants from small (under 50 employees) and large companies (more than 250 employees) indicate that in the digital age more self-managing and leadership at a distance takes place, the same does not apply to respondents from medium sized organisations (between 50 and 250 employees). Generally, the data indicates that within small and large organisations, leadership is evaluated more similarly than within medium-sized organisations. It is also striking that the largest percentage of those who indicated that leadership had not changed in the digital age, work for medium-sized organisations. The composition of the sample does not allow us to draw general conclusions; however, there is evidence in the data of IAP Study that an organisation's size and space, which is transformed through digital channels, have an impact on management structures. Having said that, a linear relationship exists between organisations' sizes and leadership through identification and goals: the larger the company, the more likely the respondents were to state that leadership over identification and goals has increased in the digital age.
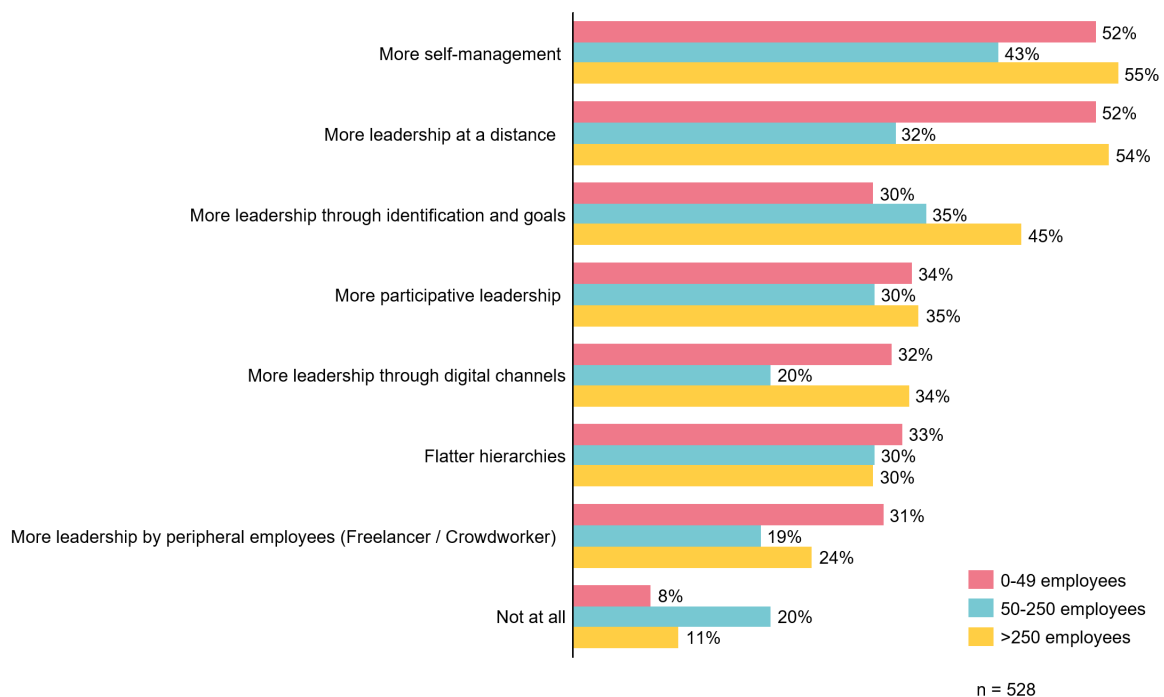

More self-management
- 0-49 employees: 52%
- 50-250 employees: 43%
- >250 employees: 55%

More leadership at a distance
- 0-49 employees: 52%
- 50-250 employees: 32%
- >250 employees: 54%

More leadership through identification and goals
- 0-49 employees: 30%
- 50-250 employees: 35%
- >250 employees: 45%

More participative leadership
- 0-49 employees: 34%
- 50-250 employees: 30%
- >250 employees: 35%

More leadership through digital channels
- 0-49 employees: 32%
- 50-250 employees: 20%
- >250 employees: 34%

Flatter hierarchies
- 0-49 employees: 33%
- 50-250 employees: 30%
- >250 employees: 30%

More leadership by peripheral employees (Freelancer / Crowdworker)
- 0-49 employees: 31%
- 50-250 employees: 19%
- >250 employees: 24%

Not at all
- 0-49 employees: 8%
- 50-250 employees: 20%
- >250 employees: 11%

n = 528

Figure 12 - To what extent has management changed in the digital age? According to organisation's size

It was mentioned several times in the commentary section to this question, that in the digital age, there is a tendency for management taking over leadership. In this context, several respondents stated that digital transformation was leading to additional control and monitoring.

Have different aspects of leadership behaviour gained, or rather lost, importance? Three quarters of participants in the IAP Study think that leadership focused on change has become more important in the digital age (Figure 13 – In your opinion, what kinds of leadership behaviours have become less/more important in the digital age?). In this sense, leading through change has gained importance as a leadership task. Leadership behaviour based on self-management is likewise classified as important by the respondents. A slight majority further believes that orientation towards relationships has become more important. However, 14 per cent feel that this aspect has become less important in the digital age. This is possibly related to some participants' experience with digital tools, such as time- and project- report-systems, being used for leadership purposes. Furthermore, conversations are often held virtually through digital channels and over a spatial distance instead of face-to-face.
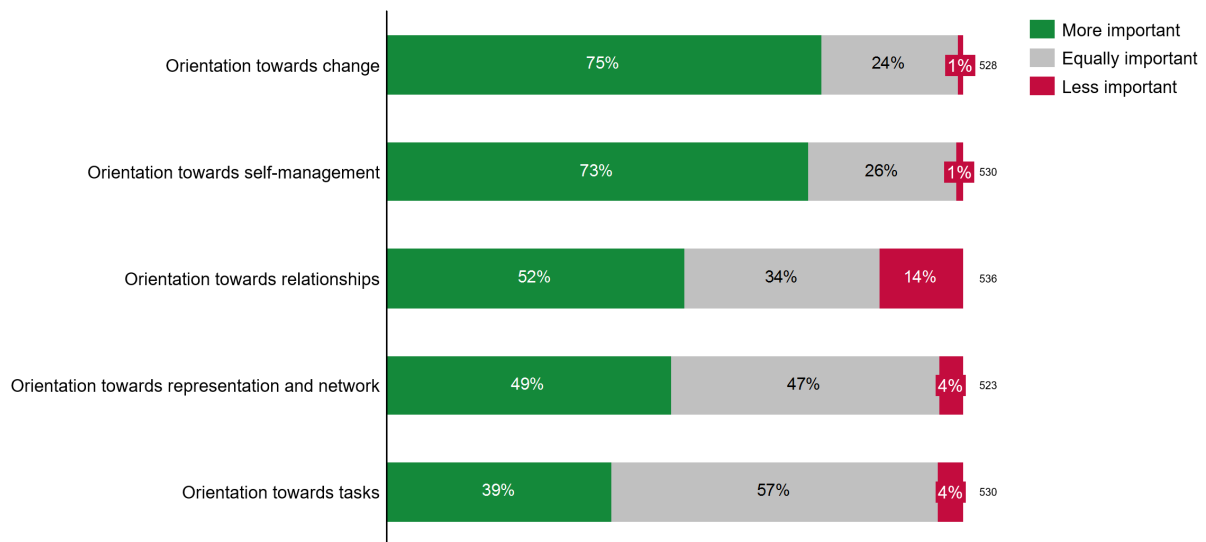
The digital age brings more self-management and more leadership at a distance. Change management is gaining importance. Some respondents observed that digitalisation, instead of leading to more leadership, leads to greater management, control and monitoring.

Figure 13 - In your opinion, what kinds of leadership behaviours have become less/more important in the digital age?

# 5. Staff Development and Learning in Organisations

Introduction of flexibility is a central concept in relation to the working work 4.0. Thanks to the internet, employees are able to choose their place of work more flexibly (local flexibility). Furthermore, models for annual working hours or working hours based on trust are replacing fixed office hours (time flexibility). The boundaries between work and leisure thus become more permeable, making reconciliation of work and family life easier. However, these changes also carry new risks. On the positive side, New marketplaces for employees arose in the environment of the sharing economy and business models with cloud working and crowdsourcing offered further working opportunities. These new working conditions should be located somewhere on the border between independence and a lack thereof (operational flexibility). With regard to job profiles, there is exemplary evidence that the content of job profiles develops through technological change, revision cycles of professions become shorter, and that professional roles are adjusted according to the transformation of a job profile (Swiss Federal Council, 2017; Meissner, i.a., 2016). These developments have a direct impact on the design of professional careers and training management within organisations.

Flexible careers and employment conditions

Employers are confronted with the question of how a career can meet the increased demands of flexibility, as well as how they can address rapidly occurring technological change by providing further training. Workers have also become more mobile. If workers feel that another company offers them better conditions of employment, they most likely will seize this opportunity and change jobs.

In this study, we asked participants what expectations they place on their organisation in terms of their professional career. The most important aspects for the respondents to keep loyal to the organisation are interesting tasks followed by active support for their personal development and employability (for example through paid training). Three-fourths see regular ? feedback about their own competence development as highly important. Just over half expect that their organisation supports them in developing their digital competencies (Figure 14 – With regards to my professional career, I expect my organisation to ...).
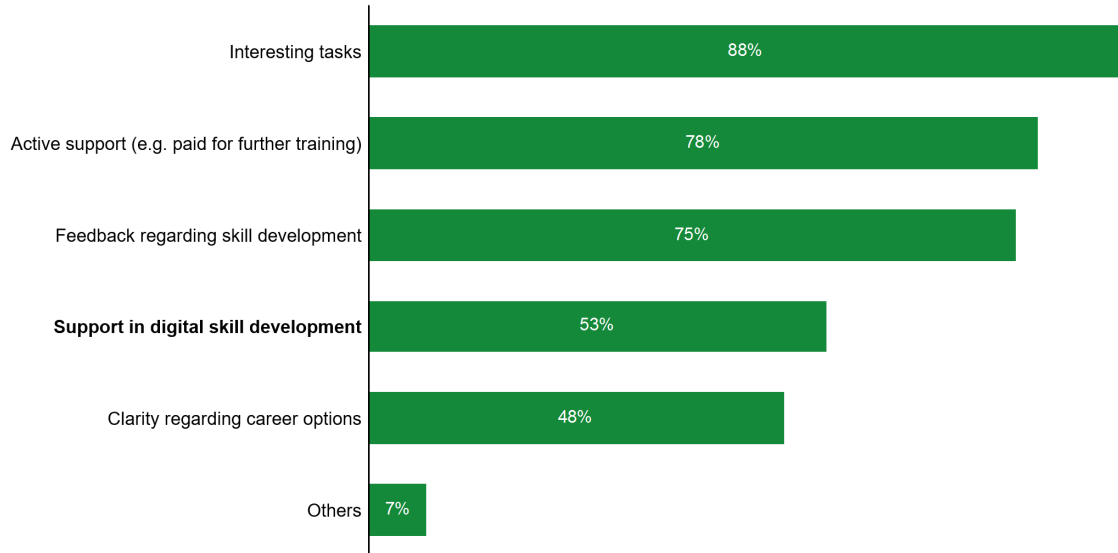
n = 583

Figure 14 - With regards to my professional career, I expect my organisation to ...

A more detailed analysis of the IAP Study's data regarding participants' age shows that younger people tend to ask their employers to pay for their training and to elucidate career options. The opposite is true when it comes to digital competency: The older the interviewed specialists and managers, the more they expect their employers to help them develop their digital skills (Figure 15 - With regards to my professional career, I expect my organisation to... According to age groups).

More than half of the surveyed specialists and executives expect their employer to support them in terms of digital skills.
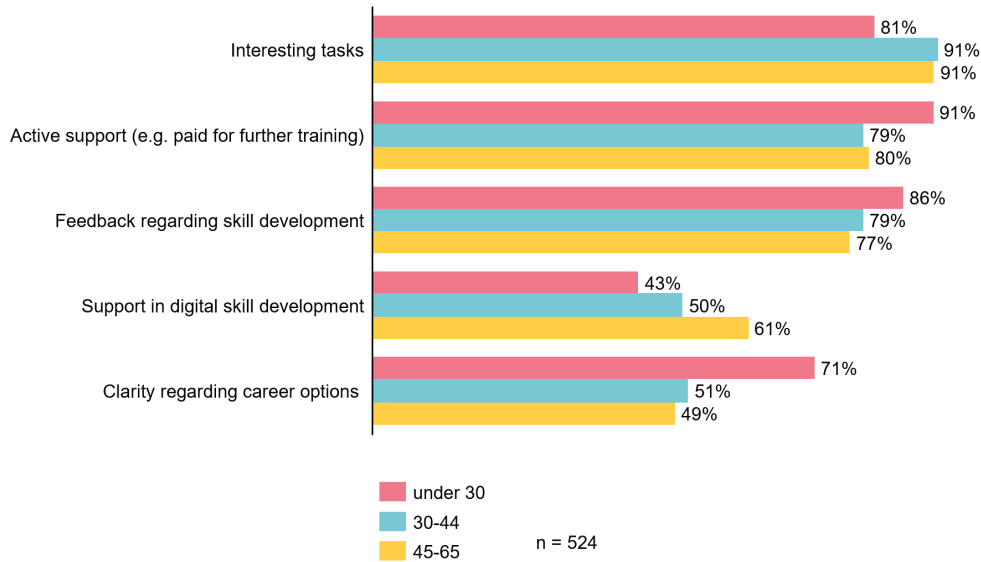
Figure 15 - With regards to my professional career, I expect my organisation to ... According to age groups

To what extent do organisations enrich modern conditions of employment with flexible options for their employees? Three-fourths of the respondents in the IAP Study stated that they are able to exercise their functions part-time as well as receive unpaid leave. A smaller percentage of respondents said that, within their organisations, it was possible to hold an executive role part-time. However, sharing their own jobs or shared management positions (Co-Leadership) are only possible in very few of these organisations (Figure 16 – Does your organisation allow for…).

Many organisations offer flexible working arrangements such as part-time or unpaid leave. Job sharing is seldom possible.

Figure 16 - Does your organisation allow for…

There is a statistical trend in the IAP Study's data that smaller organisations allow for more job sharing and shared management responsibilities than larger companies and organisations (Figure 17 - Does your organisation allow for... according to the organisation's size).
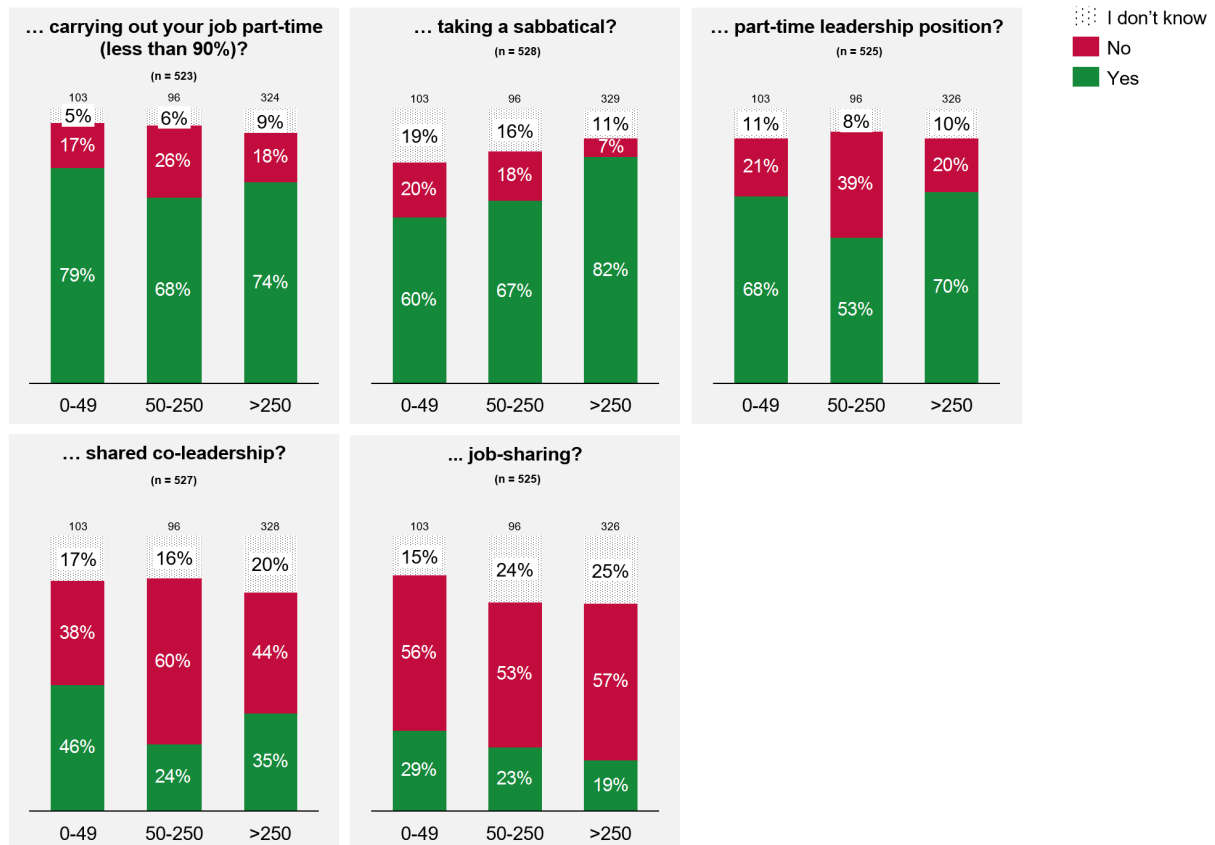
... carrying out your job part-time (less than 90%)?
(n = 523)

	0-49	50-250	>250
	103	96	324
I don't know	5%	6%	9%
No	17%	26%	18%
Yes	79%	68%	74%

... taking a sabbatical?
(n = 528)

	0-49	50-250	>250
	103	96	329
I don't know	19%	16%	11%
No	20%	18%	7%
Yes	60%	67%	82%

... part-time leadership position?
(n = 525)

	0-49	50-250	>250
	103	96	326
I don't know	11%	8%	10%
No	21%	39%	20%
Yes	68%	53%	70%

... shared co-leadership?
(n = 527)

	0-49	50-250	>250
	103	96	328
I don't know	17%	16%	20%
No	38%	60%	44%
Yes	46%	24%	35%

... job-sharing?
(n = 525)

	0-49	50-250	>250
	103	96	326
I don't know	15%	24%	25%
No	56%	53%	57%
Yes	29%	23%	19%

Figure 17 - Does your organisation allow for... according to the organisation's size

E-recruitment and online assessments

What roles do digital channels play in the recruitment of workers in the working world 4.0? 63 per cent of the participants in the IAP Study indicate that their organisations make use of social media for personnel recruitment. One third states that their organisation checks an applicant's 'digital reputation' (e.g. social media profile) during the recruitment

Social media already plays a crucial role in the recruiting process. A quarter indicates that digital skills are defined in the requirements for any new job.

process. A high proportion of respondents do not know whether their company looks at applicants' digital self-presentation. Nearly a fourth works in organisations in which online assessments are performed (Figure 18 - Digital recruitment and assessments).

Figure 18 - Digital recruitment and assessments

Learning in organisations

Digital channels have been used within organisations for human resources development and training management for a while now. About half of the IAP Study's participants work in organisations where blended learning methodology such as online training modules, video tutorials, as well as apps, have been introduced for personnel development. Some training offerings are entirely carried out online. How do

Online training and video tutorials have been established in the realm of human resources development.

participants experience online training? Of those 268 respondents who have already experienced online training, the majority rated it as positive, or rather positive. A fourth has had both positive and negative experiences. 14 per cent rated online training negatively (Figure 19 - Learning in organisations).
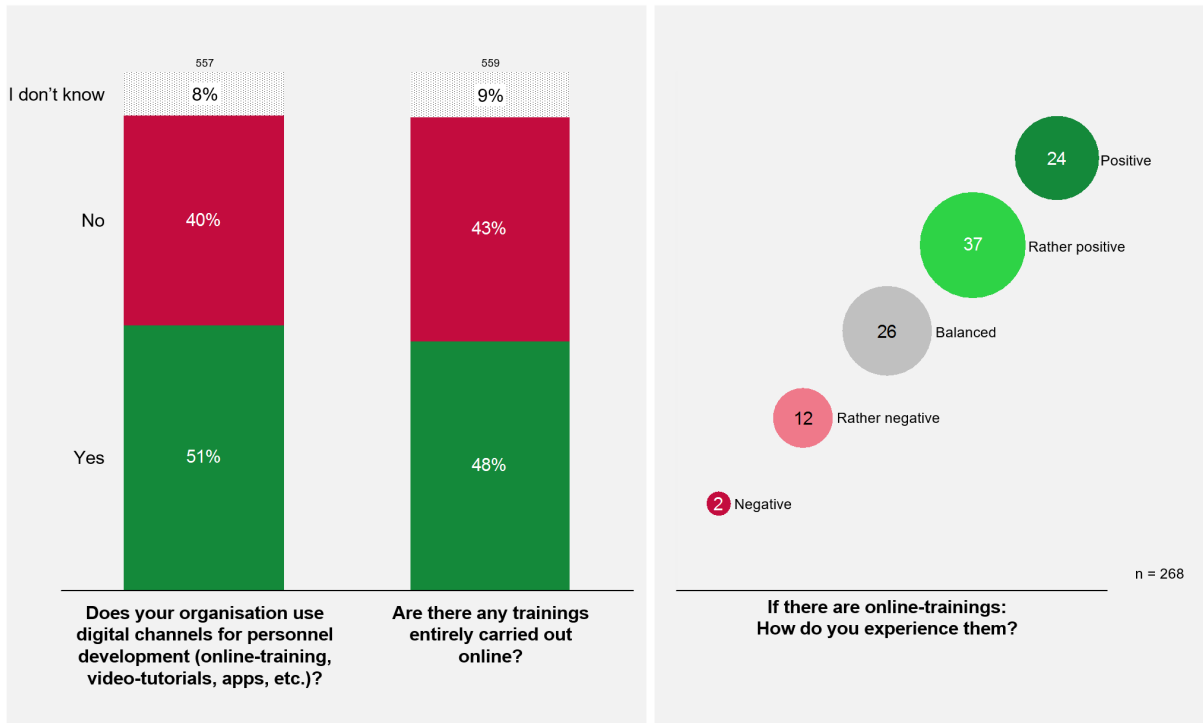
Figure 19 - Learning in organisations

More in-depth analyses of the data by age and gender show that, surprisingly enough, older employees evaluate online training more positively than younger ones. What is more, fewer of them rate it as negative. This is contrary to the popular assumption that younger workers generally look more favourably upon digital media. However, since those under the age of thirty are underrepresented in this sample, the result needs to be interpreted with caution. In terms of gender, the popular assumption that women are more critical towards technology was not confirmed (at least in terms of online training in organisations): Both men and women experience online training as equally positive, whereas men experience it slightly more negative than women (Figure 20 - Learning in organisations. According to age and gender).
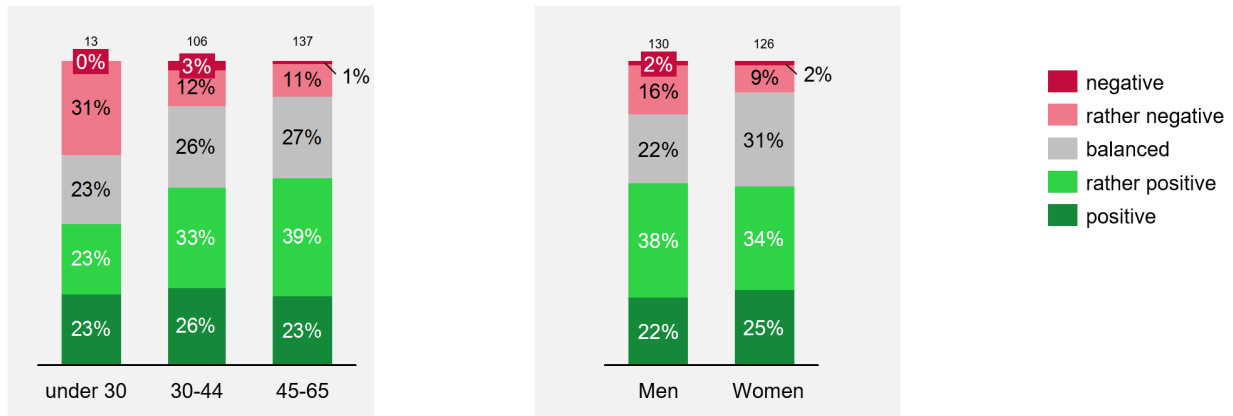
Figure 20 - Learning in organisations. According to age and gender.

Dealing with digital diversity and training

Employees possess different digital media-related skills ('digital diversity'). Generational differences regarding digital skills, in particular, are discussed by the means of the terms 'digital natives' and 'digital immigrants'. In industries that are exposed to a particularly rapid digital transformation, such as the graphic arts industry, it is crucial that and how senior employees are supported in acquiring these skills. What do you do, for instance, if they experience trouble with a new software? The IAP Study asked how digital diversity is dealt with (Figure 21 - How does your organisation deal with employees' different digital skills?). Nearly 60 per cent of respondents said that their organisation does not have a specific strategy to balance out their employees' digital skills. A fourth indicates that digital competencies are defined in the requirement profile of any new job. Almost one fifth said that digital literacy is part of their organisation's current HR strategy.
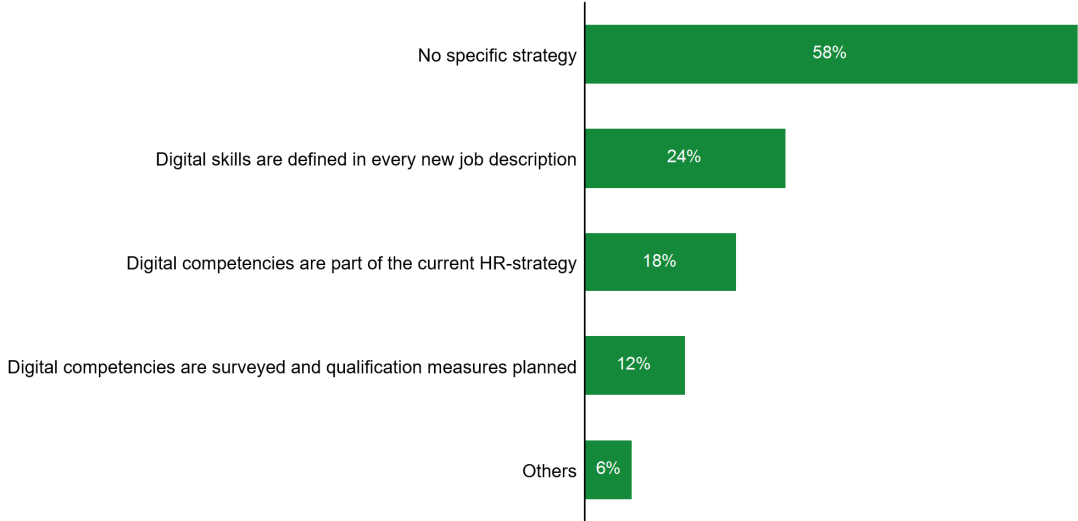
Figure 21 - How does your organisation deal with employees' different digital skills?

Does executive staff support the further development of employees' digital literacy? The IAP survey shows that about two-thirds of the respondents work in organisations where both the top leadership as well as direct supervisors create a climate in which digital skills can be developed (Figure 22 – Climate conducive to developing digital skills).
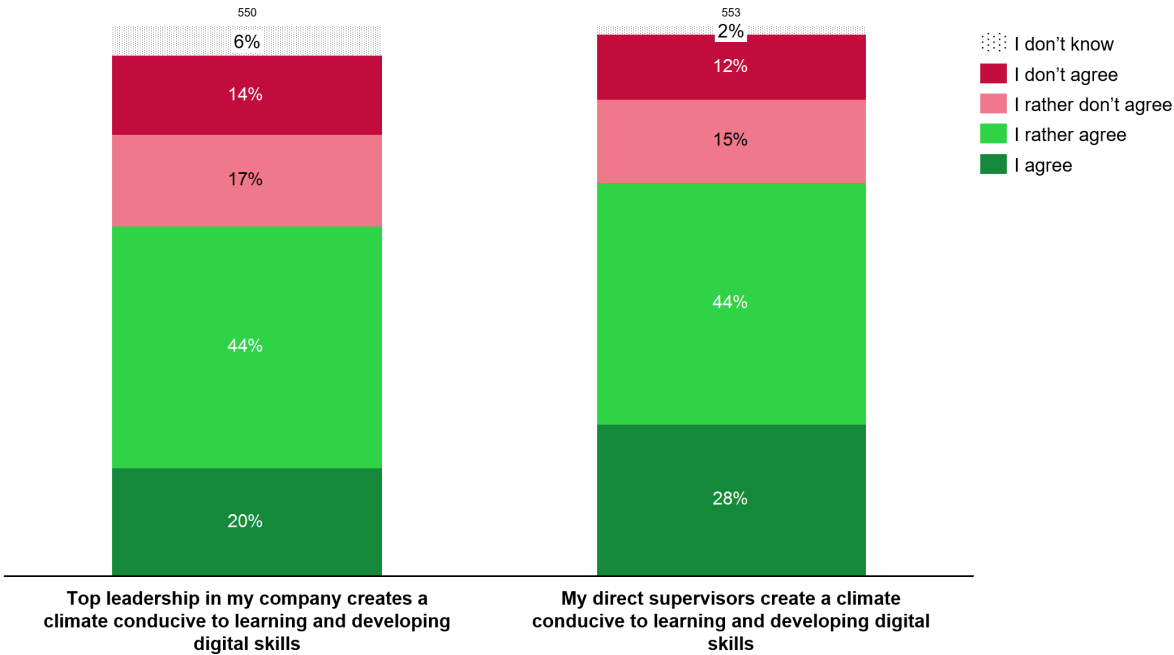

Figure 22 - Climate conducive to developing digital skills.

In-depth analysis of the data at hand has shown that there are interesting differences in terms of respondents' ages. The older the participants in the IAP Study, the more they evaluate the top management within their organisation as supportive in terms of a climate conducive to developing digital skills. There is a similar tendency with regards to their immediate supervisors although it is less articulate (Figure 23 - Climate conducive to developing digital skills according to age).
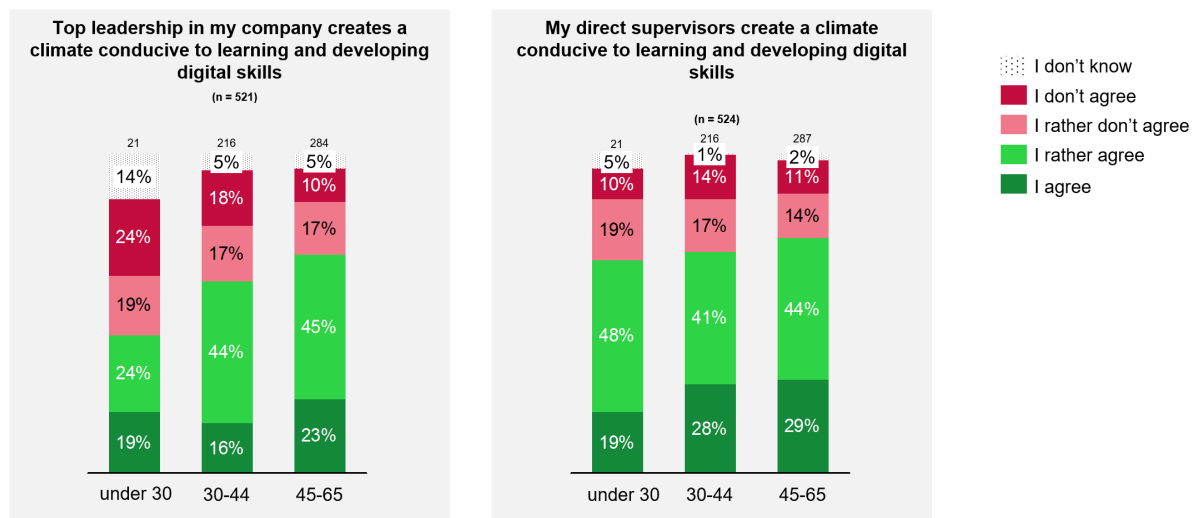

Figure 23 - Climate conducive to developing digital skills according to age

Even in the digital age, people who want to educate themselves further typically choose standard ways, i.e. onsite training courses, to do this, instead of all-online courses only. Two-thirds of respondents state that they want to continue their training in the future on an extra-occupational basis. The form favoured by most participants is a mix of classroom and online instruction termed 'blended-learning'. Only 6 per cent named all-online courses as the training format of their choice (Figure 24 - How would you like to educate yourself further?). The fact that more than half of the respondents indicated that they wish to educate themselves further through personally tailored elective modules clearly shows that the flexibility trend also affects the training market.
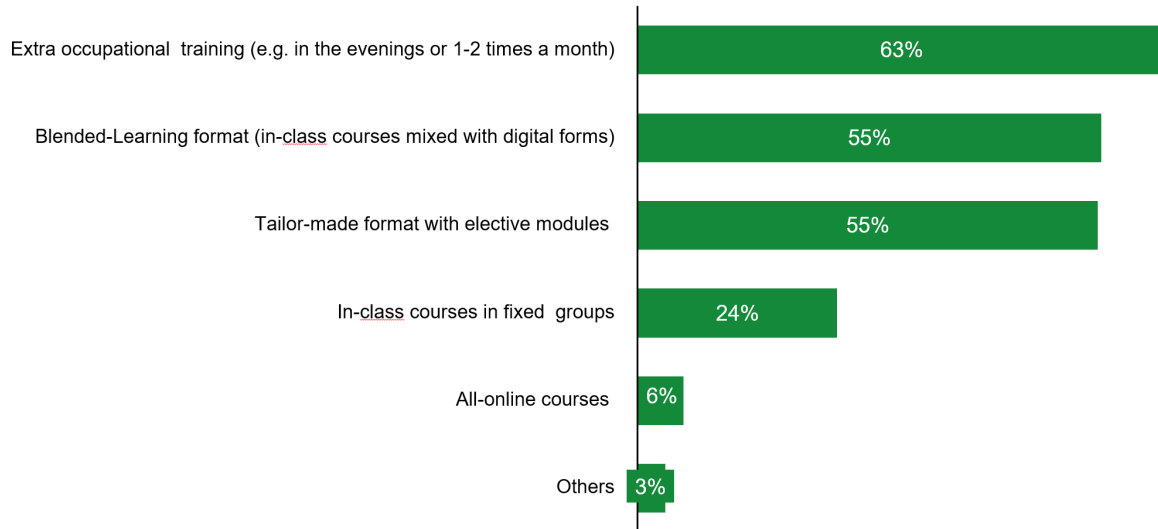
n = 568

Figure 24 - How would you like to educate yourself further?

In-depth data analysis of participants' professional training preferences according to age shows that, contrary to younger age groups, respondents between 45 and 65 prefer training in the form of regular in-classroom courses in fixed groups. At the same time, the wish for extra-occupational training was far less widespread among older participants than their younger counterparts. In terms of gender differences, it can be said that about 30 per cent of male respondents stated that they wish to receive further training in the form of regular in-classroom courses in a fixed group, whereas only 20 per cent of female participants said the same.

6. Communication, Connectivity and Health

The current interconnectedness through mobile and web-enabled devices signifies that opportunities to communicate digitally have multiplied. Employees are almost always reachable, no matter the time or location, particularly through smartphones, tablets and laptops. Furthermore, they are able to access information and documents from virtually anywhere. Because of this permanent digital availability, the boundaries between work and leisure become blurred. And changes are also happening on desktop computers in the workplace: By way of the internet, one is always reachable for personal contacts at work. Through the frequent opening of e-mails on the computer, the working process is interrupted in short time intervals.
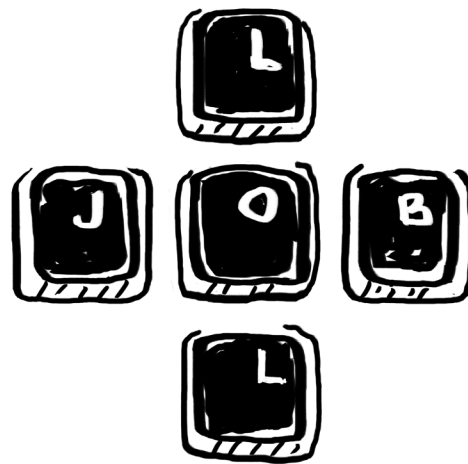
How do teams communicate with each other in the digital age? How do respondents deal with the possibility of being online always and everywhere? And how do they experience the impact of this development on their health and productivity?

Team communication

Local flexibility in the workplace affects how members of a team communicate. Those team members who are in the same location are less reliant on digital communication tools than those at dispersed locations. Two-thirds of respondents in the IAP Study work in the same place as their team members. A fourth is at dispersed locations within Switzerland and around 10 per cent are dispersed in Europe or globally.

Interestingly, e-mail has repeatedly been declared dead in favour of more modern digital tools, such as social networks and messengers (e.g. Cachelin, 2014). However, the data in this study clearly shows that almost one-third of team communication still runs via e-mail.

E-mail is the most used channel in team communication. It's even more widely used than meetings and informal agreements.

E-mail thus remains the most used channel for team communication. Almost on a par are formally scheduled in-person meetings. Nearly one-fifth of team communication is handled by informal agreements in passing, which is only possible at the same location. Around 10 per cent runs over the phone. Only a small percentage is handled through video telephony, such as Skype, messengers like WhatsApp, or internal social networks such as Slack (Figure 25 - Team location and team communication).
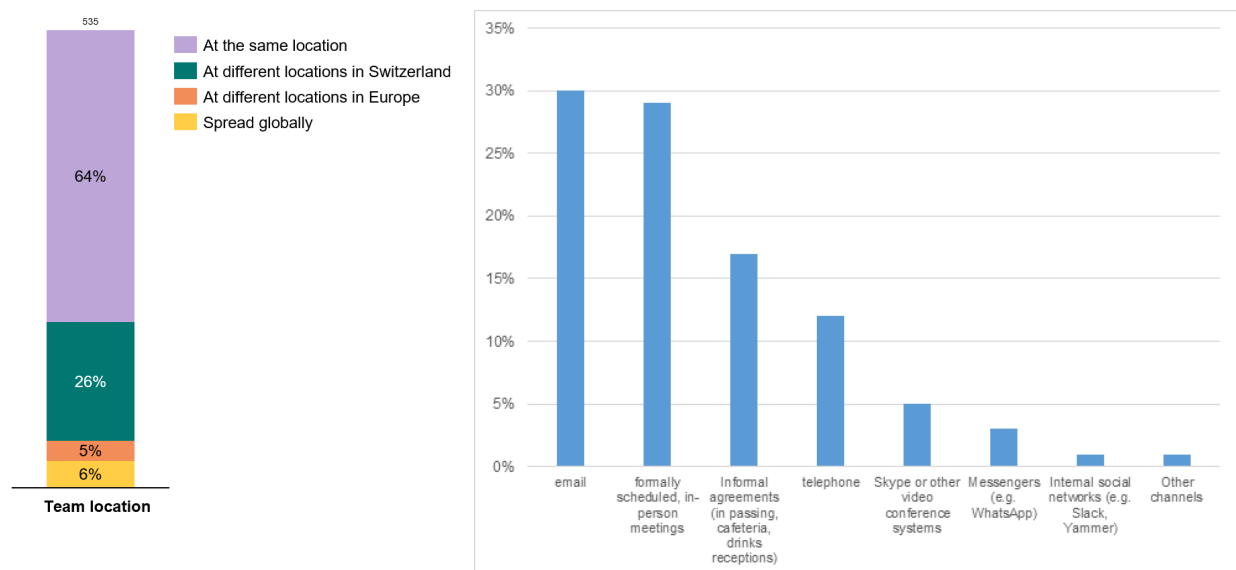

Figure 25 - Team location and team communication

How can the use of digital media in the workplace positively affect the quality of the work? More than three-fourths of respondents in the IAP Study state that they feel better informed thanks to the use of digital media at work. This, however, does not imply that professionals and executive staff believe this leads to faster or better decision making or that those decisions are implemented more efficiently. It also does not signify that a majority feels a

Four-fifths feel better informed, in terms of team communication, thanks to digital media. Nevertheless, the majority indicates that they do not work more efficiently and that the feeling of belonging to a team is not increased.
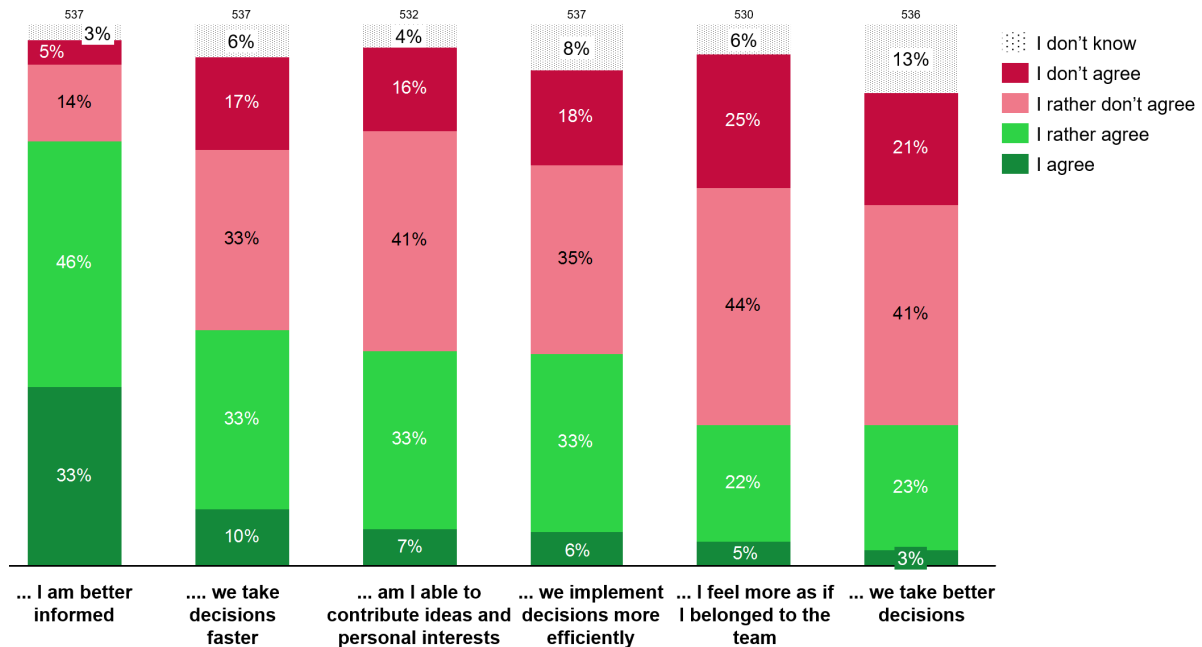
greater sense of belonging to the team, nor that they are able to weigh in more in terms of personal interests and opinions. On the contrary, as the graph below shows (Figure 26 - Through the use of digital media in the workplace (e.g. team communication) ...).

Figure 26 - Through the use of digital media in the workplace (e.g. team communication) ...

Online anywhere, anytime

In the early 1980s, the possible effects of technologically-based telework were already being discussed. Experts at that time were assuming that this could lead to a blurring of the boundaries between work and leisure (Desilver, 2014; Tydeman, Lipinski, Adler, Nyhan & Zwimpfer, 1982). Furthermore, experimental studies on the first mobile devices showed that, once the devices were in use, private and professional contexts began to shift. The boundaries between the two became increasingly blurred. The pressure to be reachable at any time, however, has not only increased in terms of being professionally available in your time off, but also to be reachable during working hours for personal matters (Genner, 2017, 63f).

On one hand, the IAP Study asks Swiss professionals and executive staff, how important the separation of work and leisure time is to them, and on the other, how participants deal with the possibility of being online anywhere, anytime.
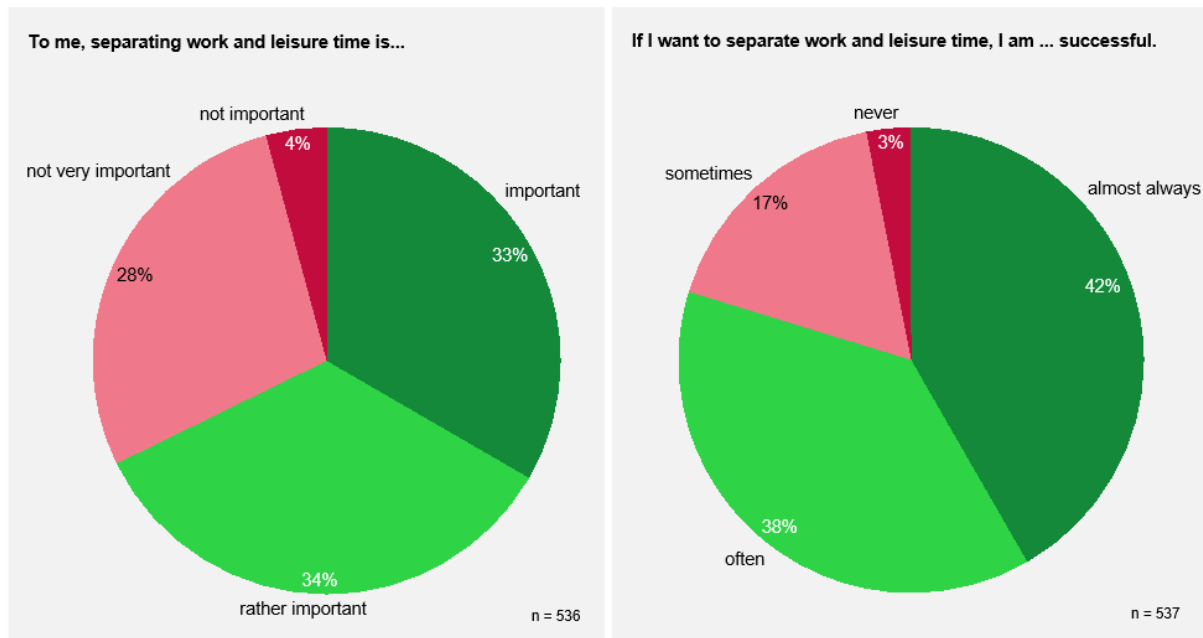
To me, separating work and leisure time is...

- not important 4%
- not very important 28%
- important 33%
- rather important 34%

n = 536

If I want to separate work and leisure time, I am ... successful.

- never 3%
- sometimes 17%
- almost always 42%
- often 38%

n = 537

Figure 27 - Separation of work and leisure

Two-thirds of the participants in the IAP Study stated that the separation of work and leisure is important to them and that, in most cases, they are able to separate them (Figure 27 - Separation of work and leisure.

Interestingly enough, there are no significant differences in age groups regarding the desire to separate leisure and work time. Occupational psychology surmises that, rather than generational differences, there is a spectrum with respect to the 'boundary management' (setting boundaries) between work and private life: At one end of the spectrum are the integrators, who wish to combine work and play and who appreciate permeable boundaries between the two. At the other end of the spectrum, there are the separators who feel strongly about the strict separation of work and leisure. In this sense, about two-thirds of respondents belong to the group of separators, while one-third are more likely integrators. Consequently, the blurred boundaries between work and leisure are experienced differently.

For executive staff, there are certain statistical tendencies found in the data: The more management responsibility someone possesses, the less importance they give to the separation of work and leisure, and the less successful they are at implementing such a separation. The differences between independent and salaried workers are more significant: 52 per cent of self-employed workers do not care about the separation of work and leisure, whereas with salaried workers it is only 31 per cent.

How do the surveyed specialists and executive staff manage their digital availability? Almost half is reachable for the employer outside of working hours. Around one-fourth are online in a private capacity during working hours (Figure 28 - Digital reachability between work and private life). These figures make it clear that the blurring of the boundaries between private life and work goes both ways.

Over half of the respondents are digitally reachable outside of working hours.

There is empirical evidence suggesting that many workers are digitally reachable in their free time, even though they were not explicitly asked to be (Syndicom, 2015). Whether this is because they want to be reachable for their work colleagues, who are taking care of their tasks in their absence, is not discernible from the data.
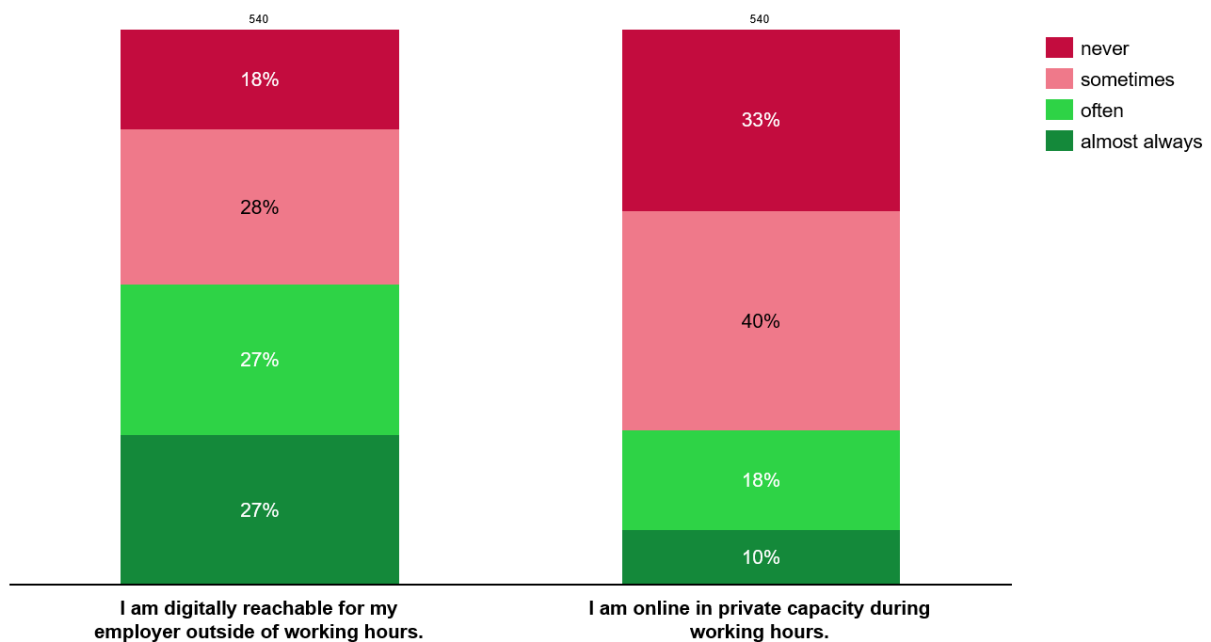

Figure 28 - Digital reachability between work and private life[2]

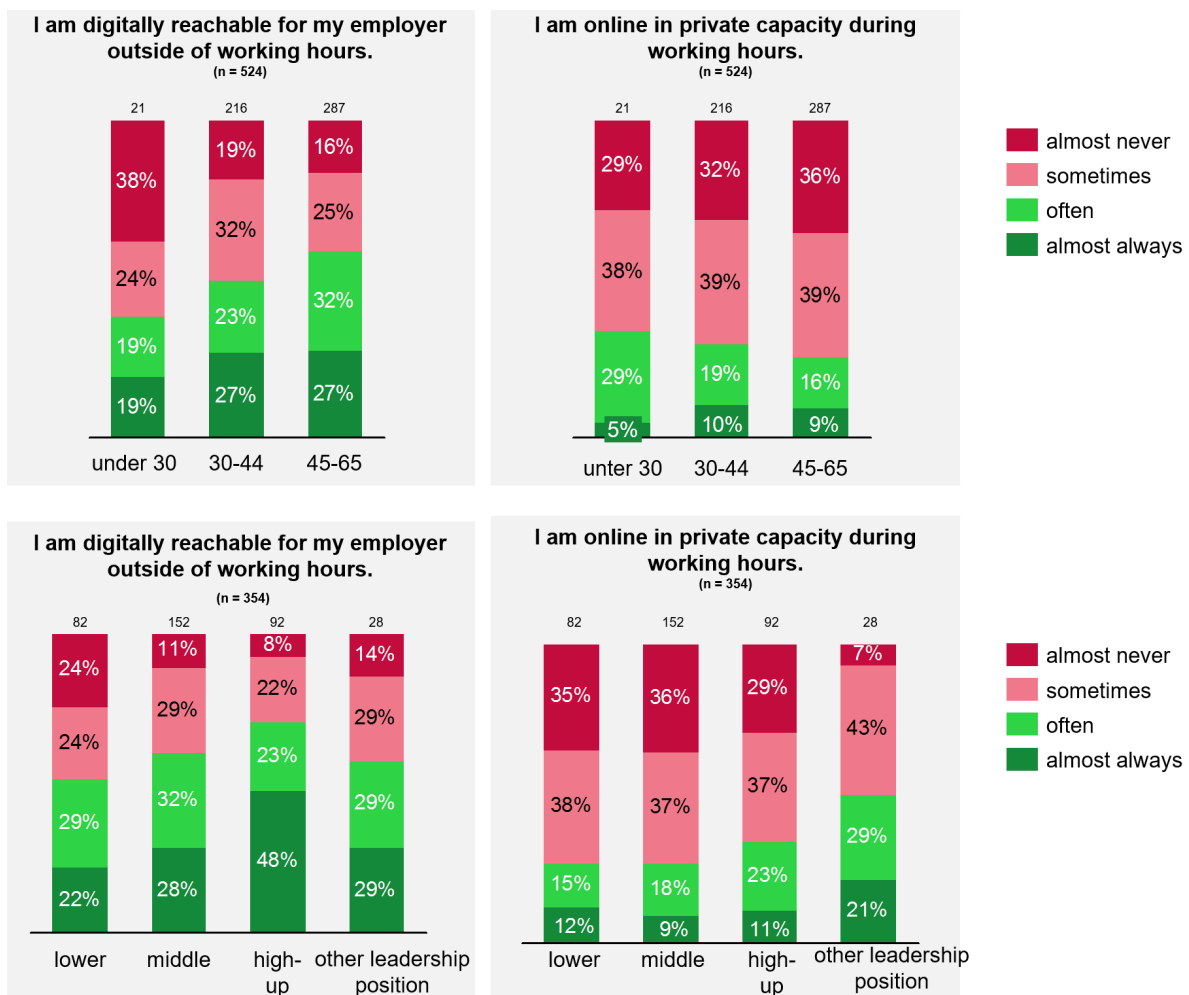In-depth analyses indicate age differences and differences between management levels (Figure 29- Digital reachability between work and private life, according to age and management level).

When dealing with digital availability, there are some age effects, which might be surprising at first glance. Generally, it is said that younger workers are less strict in drawing the boundaries of digital availability. However, the figures of the study show that this is valid only in one direction: Younger respondents tend to be less reachable for the employer in their free time, but are more frequently online in a private capacity at work. The fact that younger people are online at work more frequently than older workers may indeed be due to their different media socialisation. For younger people, the

_____
[2]Revised 28th May, 2021

boundaries between online and offline, as well as the professional and the personal sphere, are more blurred. Why is it than that young people are less reachable in their leisure time than older people? For older workers, being online in a professional capacity during leisure time might be less problematic: Based on experience and personal development, they are better equipped to counter excessive expectations by their employer. Exploratory research results suggest that the strain of constant digital accessibility, paired with a limited ability to distance themselves, correlate (Genner, 2017, 76f). However, these age differences may indirectly be related to executive functions: Executives are, by trend, older, and with increasing levels of responsibility they are also expected to be reachable in their spare time.

Figure 29 - Digital reachability between work and private life, according to age and management level

How does constant digital reachability affect respondents' productivity, creativity, as well as health and sleep? The numbers in the health sector are alarming, whereas in terms of productivity and creativity they rather point to a dilemma. Around 4 in 10 respondents feel more productive through the use of mobile internet, while 3 in 10 indicate that their productivity is deteriorating. Nearly a third of the respondents stated that the constant internet access helped them be more creative, whereas a fourth felt the opposite, namely less creative. Considerably more telling are the numbers in regards to health and sleep: while about half indicate that constant digital reachability has no effect on these areas, the other half of respondents notes that health and sleep deteriorate due to the permanent online access (Figure 30 – How does constant digital reachability affect you in terms of…?).
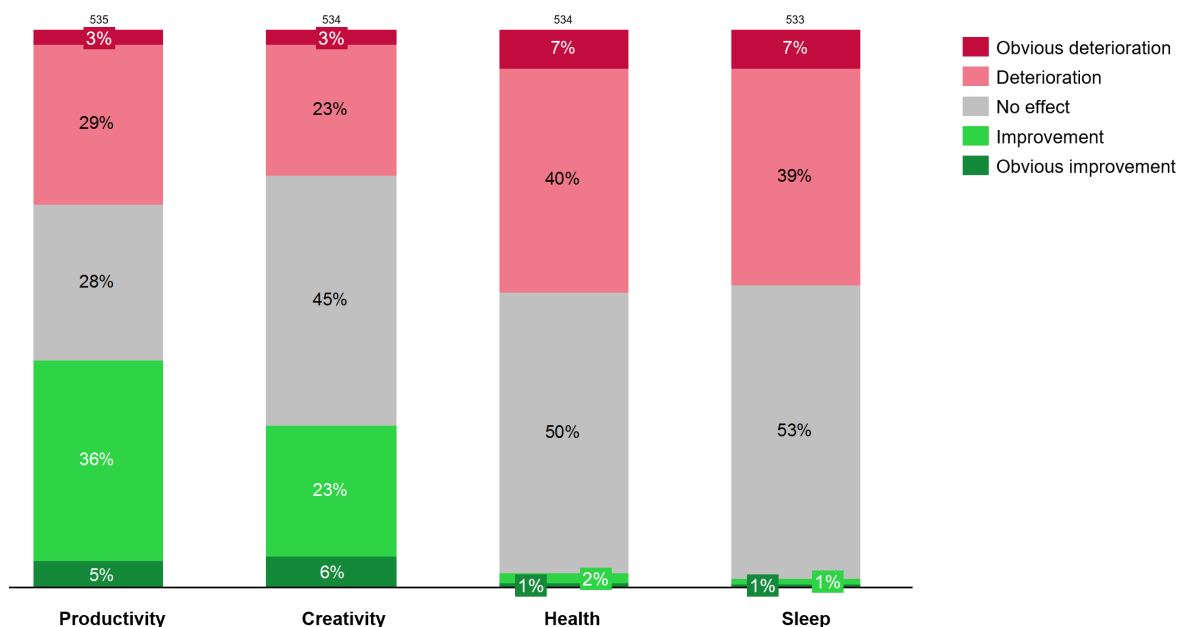
Figure 30 - How does constant digital reachability affect you in terms of…?

Considering that a high number of respondents' health and sleep have suffered from the constant digital reachability, one could expect that going offline is a relaxing experience for most. It appears, however, that, similar to the

Around half of the respondents suffer from deteriorating health and sleep due to constant digital connectivity.

assessments of the effects on productivity and creativity, the answers to this question fluctuate heavily. While a third assumes that going offline has no effect on the degree of their relaxation, about 40 per cent indicate that going offline relaxes them greatly. And yet another fourth indicates that the opposite is the case. Being offline makes them nervous (Figure 31 - If I have no online access ...).

15
.... it relaxes me greatly

26
... relaxes me to an extent

35
.... does not affect my well-being

22
... makes me a little nervous

2
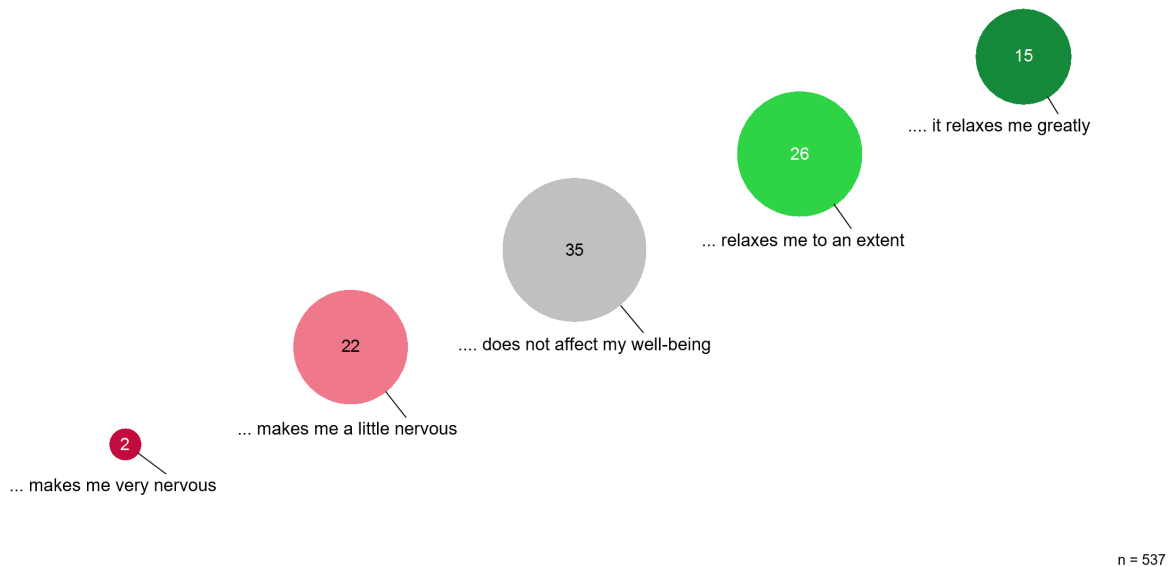... makes me very nervous

n = 537

Figure 31 - If I have no online access ...

55 per cent would deem it useful if their employer clearly defined reachability expectations outside of working hours.

Research suggests that the way people experience constant digital reachability primarily depends on the extent to which it can be individually controlled. In other words: The more self-determined digital accessibility, the less it is seen as a disturbing factor (Leung, 2011). The figures of the IAP Study are encouraging in so far as they show that the vast majority of interviewed specialists and executive staff experience their own reachability as mostly, or even exclusively, self-determined. All the more interesting is it that still more than half think it would be useful if the employer clearly defined reachability expectations outside of working hours (Figure 32 - Digital accessibility, self-determination and regulation).
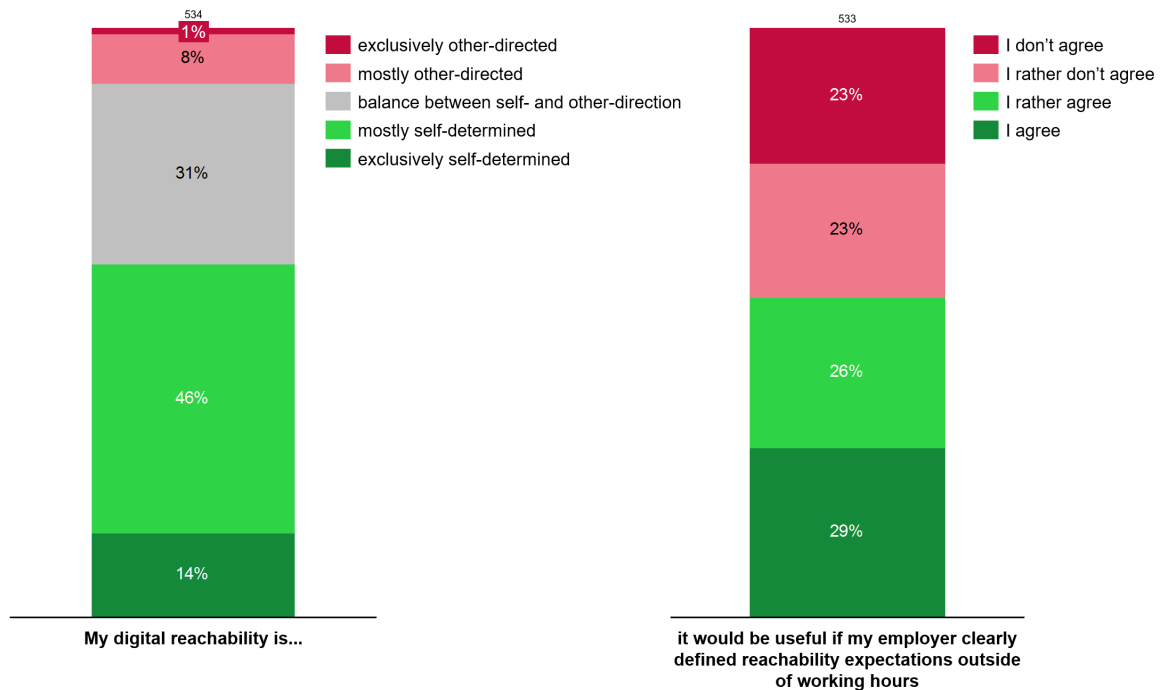
Figure 32 - Digital accessibility, self-determination and regulation

Performance and handling of pressure

The results of the representative Swiss Job Stress Index 2016 reveal that one in ten employees experiences stress at work. Likewise, one in ten employees feels exhausted. Stress is costing employers around 5.7 billion Swiss francs per year. Young employees are more frequently stressed and exhausted, whereas executives are less stressed than people without managerial responsibility (Health Promotion Switzerland, 2016). How many of the current stress factors are caused by the digital transformation of the working world is difficult to estimate. For one, digitalisation accelerates work processes and the changing of job profiles, which has implications for job security. Furthermore, it leads to an increasing spatial and temporal de-limitation, which might increase the pressure level on workers. However, besides digitalisation, there are other factors responsible for increasing stress levels in the workplace, such as economisation, individualisation, globalisation or multi-option society (Hunziker, 2015).

How do the surveyed specialists and executive staff deal with the pressure to perform in a resource-oriented manner? In most cases, according to the figures of the present study, they seek compensation by spending time with family or friends. As almost equally important, they evaluate sufficient sleep. Exercising comes in third, followed by other hobbies. Just over half also optimises their working methods. Only a minority rejects additional tasks or waive career steps for the sake of remaining efficient for longer (Figure 33 - What strategies help you to remain efficient for longer?).
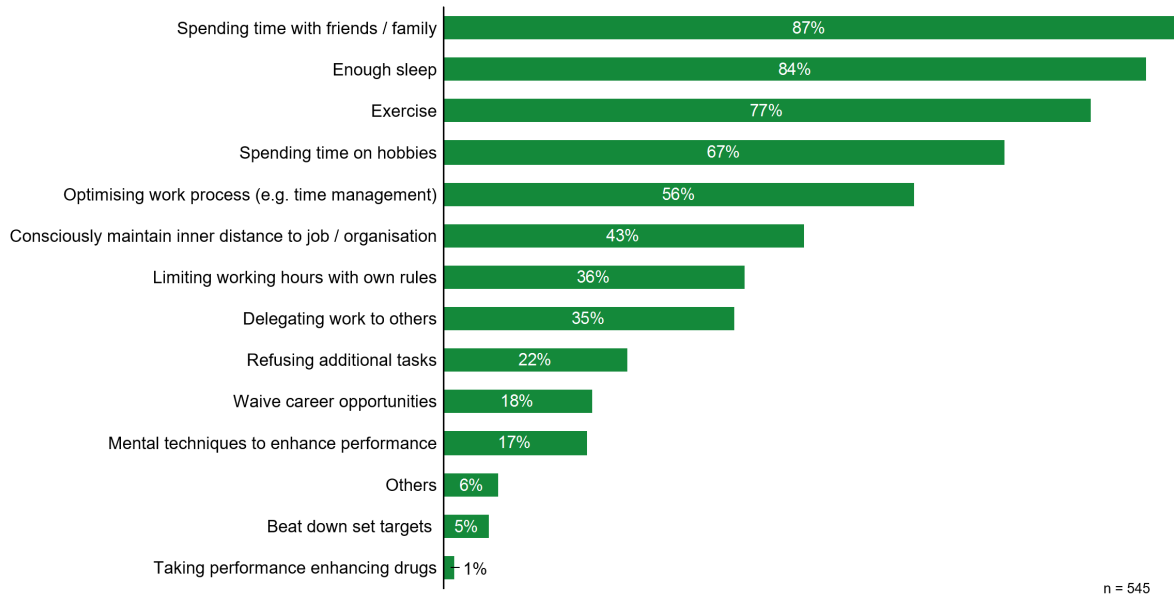
Spending time with friends / family — 87%
Enough sleep — 84%
Exercise — 77%
Spending time on hobbies — 67%
Optimising work process (e.g. time management) — 56%
Consciously maintain inner distance to job / organisation — 43%
Limiting working hours with own rules — 36%
Delegating work to others — 35%
Refusing additional tasks — 22%
Waive career opportunities — 18%
Mental techniques to enhance performance — 17%
Others — 6%
Beat down set targets — 5%
Taking performance enhancing drugs — 1%

n = 545

Figure 33 - What strategies help you to remain efficient for longer?

According to respondents' estimates, executive staff, in particular, have been subject to increasing pressure through digitalisation. Given the sample in which two-thirds say they possess management responsibilities, one can assume that many of them are talking about themselves. The IAP Study's participants view IT professionals and employees in the functional areas of marketing and communication in second and third place. In fourth and fifth place are HR specialists and education managers in the operational context (Figure 34 – In your opinion, who has been subject to increasing pressure through digitalisation?).

Executive staff	69%
IT	61%
Marketing & communication	53%
HR	41%
Education management	37%
Finance & Controlling	25%
Others	10%

n = 545
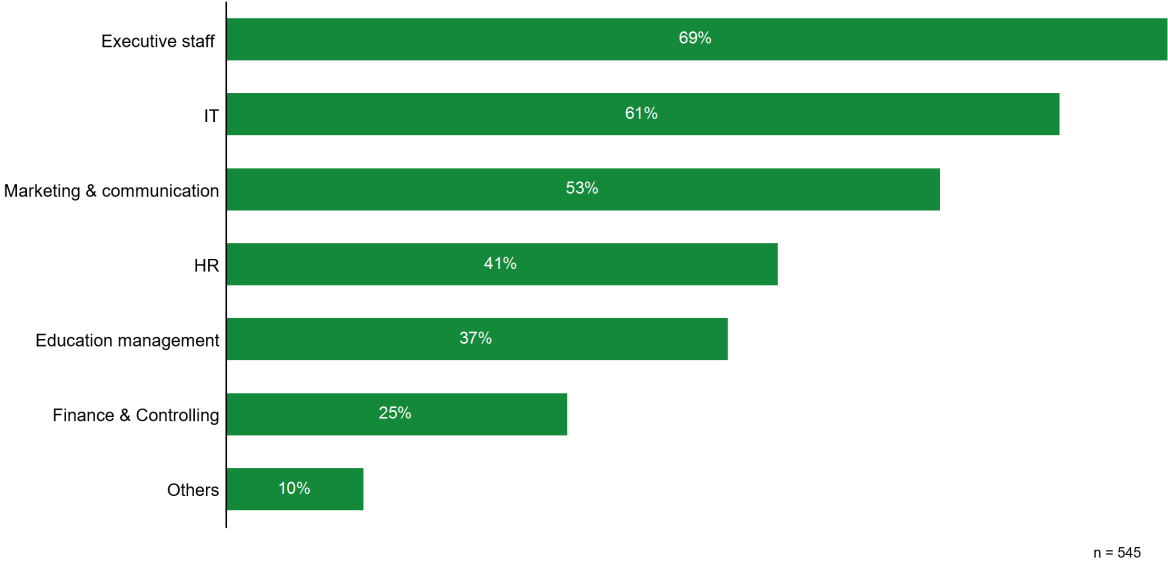
Figure 34 - In your opinion, who has been subject to increasing pressure through digitalisation?

7. Employees and Leaders of the Future

We asked the respondents about future developments in terms of workers and executive staff:
First of all, what is valuable manpower, secondly valuable executives, and thirdly, what does digital literacy entail? To answer this question, hundreds of open answers were manually categorised, summarised in umbrella terms, and presented in word clouds. The larger the word, the more often it was used.

What stands out in all three categories is the term 'up to date'. In times of rapid change, employees, who are at the peak of technological development, time and ongoing projects, are particularly valuable. Keywords such as training, flexibility and willingness to change, which are prominently represented in all three word clouds, point to how change is dealt with.

So far, there are no solid estimates of what new jobs will be created by digitalisation, and how high the number of newly created jobs will be, which is why high levels of development capacity and adaptability are required of workers in the future (Figure 35 – Valuable workers of the future). It is therefore understandable that the surveyed specialists and executive staff assess future workers as valuable if they are open to change, flexible and keen on further training.

Figure 35 - Valuable workers of the future

Respondents furthermore assess workers with a good work-life balance as valuable. The term is controversial because it suggests that 'work' is not part of 'life'. Nevertheless, it is still more popular than alternatives such as life-domain balance. A good work-life balance entails a lot of self-control. This coincides with the above-mentioned estimates, regarding changes in leadership behaviour particularly the assessment that self-leadership has gained importance in the digital age. Interestingly enough, respondents deem the work-life balance amongst executives as less important than

> **Even in the digital age, future executives are expected to be proficient in face-to-face communication. Furthermore, they should be supportive of their staff, as well as open to change.**

amongst regular workers (Figure 36 - Valuable executives of the future). Amongst executives, the ability to set boundaries was frequently named as a valuable characteristic of future leaders. This might be indirectly connected with the issue of work-life balance: Those who are good at setting boundaries, are able to protect themselves and their employees from an excessive workload.

Figure 36 - Valuable executives of the future

Most frequently mentioned by respondents, however, was the issue of support. In the digital age leaders are, above all, expected to support, encourage and empower their employees in a resource-oriented manner. Some respondents mentioned the idea that managers play a coaching role. In terms of digitalisation, it is particularly interesting that participants in the IAP Study give about the same weight to face-to-face (F2F) communication skills as digital literacy.

How do respondents imagine digital literacy of the future (Figure 37 – Digital literacy of the future)? Even though digital skills of the future likewise entail employees being up-to-date and able to deal with media confidently, it is striking that respondents' most frequent understanding of digital literacy primarily entailed the targeted use of media. This is understandable, given the great variety of possible information, communication

For most respondents, digital literacy means being able to use digital media in a focused, rather than in application-competent manner.

and publication channels. Thanks to the variety of digital media uses, it has become increasingly challenging to choose the appropriate channel, or right medium, for a certain task, message, or target audience. Being able to separate oneself from the numerous information and communication requirements which workers encounter in their professional, as well as their private lives, is likewise considered an important aspect of digital literacy. Further training serves to develop the skills of sovereign and targeted media use.

Figure 37 - Digital literacy of the future

Sample and Methodology

Overall, the Institute of Applied Psychology (IAP) has interviewed around 600 Swiss specialists and executive staff. This is a non-probabilistic sample within the field of IAP stakeholders. The survey was conducted online by the means of the professional software Unipark. It was distributed in December 2016 and January 2017 through several mailing lists and social media channels. In each case, the survey lasted between 10 and 15 minutes. 629 people answered the first questions, whereas this number decreased to 530 at the end of the questionnaire, where the socio-demographic data was collected. Information on how many people exactly answered each question can be found in this report for every graphic. The data was analysed using the statistical program SPSS, predominantly in a descriptive manner. Open questions were categorised manually, counted out by Excel, and arranged in word clouds by the software Wordle. Based on how many times a word was mentioned, the word clouds depict what categories came up most through the size of their font. Below is some detailed information on the sample:

528

No 33%

Yes 67%

management tasks

354

23%

43%

26%

8%

management
level

- Lower management (e.g. team leader)
- Middle management (e.g. department head)
- Higher management (e.g manager, CEO)
- Other management positions

527

20%

9%

13%

15%

12%

4%

11%

16%

Field of
occupation

- Public sector
- Business & industry
- Health
- Education & research
- Information & communication
- Trade
- Finance
- Others

525

4%

6%

5%

4%

8%

6%

34%

34%

Function

- Production
- Development
- Sales
- Finance & controlling
- Marketing & communication
- IT
- HRM / training
- Others

528

0-49   20%

50-250 18%

>250   62%

Number of
employees

List of Figures

Bibliography

Autor, D. H. (2015). Why Are There Still So Many Jobs? The History and Future of Workplace Automation. *Journal of Economic Perspectives*, *29*(3), 3–30. https://doi.org/10.1257/jep.29.3.3

Bonin, H., Gregory, T., & Zierahn, U. (2015). *Übertragung der Studie von Frey/Osborne (2013) auf Deutschland. Endbericht an das Bundesministerium für Arbeit und Soziales* (No. Kurzexpertise Nr. 57). Zentrum für Europäische Wirtschaftsforschung. Abgerufen von ftp://ftp.zew.de/pub/zew-docs/gutachten/Kurzexpertise_BMAS_ZEW2015.pdf

Bundesministerium für Arbeit und Soziales Deutschland. (2015). Grünbuch - Arbeiten 4.0. Abgerufen von www.arbeitenviernull.de

Bundesrat der Schweizerischen Eidgenossenschaft. (2017). *Bericht über die zentralen Rahmenbedingungen für die digitale Wirtschaft*. Schweizerische Eidgenossenschaft. Abgerufen von https://www.newsd.admin.ch/newsd/message/attachments/46892.pdf

Cachelin, J. L. (2014). Führen im digitalen Zeitalter. Von der Push- zur Pull-Führung. *Best Recruiters*, *5. Jahrgang*(15). Abgerufen von https://www.wissensfabrik.ch/pdfs/digitalleadership.pdf

Desilver, D. (2014, Mai 19). 32 years ago, experts foresaw much of today's digital world. Abgerufen 7. April 2017, von http://www.pewresearch.org/fact-tank/2014/05/19/32-years-ago-experts-foresaw-much-of-todays-digital-world/

Firlej, M., & Kluz, A. (2016, Mai 16). How to be a leader in the digital age. Abgerufen 7. April 2017, von https://www.weforum.org/agenda/2016/05/how-to-be-a-leader-in-the-digital-age/

Frey, C. B., & Osborne, M. (2013). The Future of Employment: How susceptible are jobs to computerisation? Abgerufen 10. März 2017, von http://www.oxfordmartin.ox.ac.uk/downloads/academic/The_Future_of_Employment.pdf

Genner, S. (2017). *ON/OFF: Risks and Rewards of the Anytime-Anywhere Internet*. vdf Hochschulverlag an der ETH Zürich.

Gesundheitsförderung Schweiz. (2016). Job-Stress-Index 2016: Ein Viertel der Erwerbstätigen ist erschöpft und gestresst. Abgerufen 4. Mai 2017, von https://gesundheitsfoerderung.ch/ueber-uns/medien/medienmitteilungen/artikel/job-stress-index-2016-ein-viertel-der-erwerbstaetigen-ist-erschoepft-und-gestresst.html

Godehardt, B. (1994). Entwicklung der Telearbeit und Begriffsbestimmung. In *Telearbeit* (S. 21–49). VS Verlag für Sozialwissenschaften. https://doi.org/10.1007/978-3-322-93504-5_2

Hunziker, R. (2015, März 29). Depressionen: «Nicht nur die Freiheit, auch die Erwartung ist gewachsen». *NZZ am Sonntag*. Abgerufen von https://www.nzz.ch/nzzas/nzz-am-sonntag/nicht-nur-die-freiheit-auch-die-erwartung-ist-gewachsen-1.18512018

Kagermann, H., & Lukas, W.-D. (2011, April 1). Industrie 4.0: Mit dem Internet der Dinge auf dem Weg zur 4. industriellen Revolution. Abgerufen 5. Mai 2017, von http://www.vdi-nachrichten.com/Technik-Gesellschaft/Industrie-40-Mit-Internet-Dinge-Weg-4-industriellen-Revolution

Leung, L. (2011). Effects Of Ict Connectedness, Permeability, Flexibility And Negative Spillovers On Burnout And Job And Family Satisfaction. *Human Technology 7(3)*. https://doi.org/10.17011/ht/urn.2011112211714

Meissner, J. O., Weichbrodt, J., Hübscher, B., Baumann, S., Klotz, U., Pekruhl, U., … Gisler, A. (2016). *Flexible neue Arbeitswelt: Eine Bestandsaufnahme auf gesellschaftlicher und volkswirtschaftlicher Ebene*. vdf Hochschulverlag an der ETH Zürich.

Passig, K., & Scholz, A. (2015). Schlamm und Brei und Bits. Warum es die Digitalisierung nicht gibt. *Merkur*, *69*(11), 75–81.

Pfister, A. (2011). *The dynamic five-factor model of leadership : developing and testing a holistic approach to leadership behavior*. University of Zurich. Abgerufen von http://www.zora.uzh.ch/57035/

Schneider, B. (2007). *Textiles Prozessieren: eine Mediengeschichte der Lochkartenweberei*. Diaphanes.

Städler, I. (2017, April 28). Digitale Revolution gefährdet auf dem Land mehr Jobs als in Städten. *Tages-Anzeiger*. Abgerufen von http://www.tagesanzeiger.ch/wirtschaft/standarddie-digitale-revolution-gefaehrdet-auf-dem-land-mehr-jobs-als-in-staedten/story/26244036

Steck, A. (2017, April 2). Kampf um den Bürotisch. *Neue Zürcher Zeitung.* Abgerufen von http://webpaper.nzz.ch/2017/04/02/wirtschaft/Q6G1L/kampf-um-den-buerotisch?guest_pass=fa60d55ea0%3AQ6G1L%3Afd57abd8b14acb7f645a6e59e4b781275d0ae68f

Syndicom. (2015). Entgrenzung der Arbeit. 20 Antworten von 3500 Beschäftigten der Schweizer Telekombranche zu ihrer Arbeitssituation. Abgerufen von http://www.syndicom.ch/fileadmin/user_upload/Dokumente/Dossiers/Entgrenzung_der_Arbeit/Entgrenzung_der_Arbeit_syndicom.pdf

Tydeman, J., Lipinski, H., Adler, R. P., Nyhan, M., & Zwimpfer, L. (1982). *Teletext and Videotex in the United States: Market Potential, Technology, Public Policy Issues*. New York, N.Y: McGraw-Hill Publishing Company.

Weitekamp, L. (2016). „Ersetzt ‚Digitalisierung' durch ‚Gulaschsuppe'": Kathrin Passig über einen problematischen Begriff | t3n. Abgerufen von http://t3n.de/news/digitalisierung-gulaschsuppe-kathrin-passig-690473/

Willimann, I., & Käppeli, S. (2017). *Digitalisierung trifft Land härter als Stadt*. Die Volkswirtschaft - Plattform für Wirtschaftspolitik. Abgerufen von http://dievolkswirtschaft.ch/de/2017/04/willimann-06-2017/

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