Effects of Workplace Digitalisation on the Motivation of German Office Employees

Senta Dziubek[1], Olivier Fuchs[2], Stefan Schwarz[3]

[1]CBS International Business School, Cologne, Germany
[2]Edinburgh Business School / Heriot-Watt University, Edinburgh, United Kingdom and
CBS International Business School, Cologne, Germany *
[3]CBS International Business School, Cologne, Germany

*Corresponding Author: of11@hw.ac.uk or o.fuchs@cbs.de

Abstract: Digitalisation allows more processes to be technologically supported and to increasingly implement remote work throughout all industries in order to enhance efficiency. However, new challenges arise. While employees can also profit from increased flexibility, communication with the management is changing and leaders need to tackle issues such as team and trust building, concerns around negative effects of remote electronic work and the management of engagement and performance via electronic means. Motivation is a key element thereof, and as part of a research lab on virtual and remote leadership in digital ecosystems, we endeavoured to gain insight into whether digitalisation of the workplace influences employees' motivation to work and whether there are preferences for purely electronic or rather for hybrid models. The aim was to be able to come up with recommendations for virtual leaders.

A qualitative analysis of the responses of 92 participants from different companies and age groups, all with experience of working remotely, was conducted. The average age of the group was about 10 years below the German average of employed people, but while this might lead to a bias towards the views of younger people, the results allowed some valuable initial results. Some motivational factors around digitalisation of the workplace were identified, such as technical equipment and autonomy, but this in itself will not suffice in order to manage employee motivation. Rather, is also important how digitalisation is introduced, and companies will have to manage introduction and support as a complex construct dependent on many factors.

1. Introduction

The far-reaching effects of digitalisation on work processes are changing the way employees perceive their current situation and their workplace design options. The same applies to companies: for example, home office concepts are at least planned and in many instances already being implemented and the COVID-19 pandemic has accelerated these developments [1]. Extensive digitalization and the making of work more flexible that comes with it,

and even the digital transformation of business models were seen as indispensable for overcoming the challenges caused by the pandemic [2], and many of these changes are likely to remain permanent as the so-called "new normal" [3].

Home office solutions and increasing electronic communication are among the most visible and noticeable changes. Before the pandemic, only 4% of German employees worked in a home office, but in April 2020 the figure was already at 27%. This decreased somewhat due to

---

Corresponding Author: Olivier Fuchs, EBS, Heriot-Watt University Gait 11, The Avenue, Currie EH14 4AS, United Kingdom

the relaxation of previously imposed restrictions but is still well above 20% [4]. However, electronic working (teleworking) brings new challenges and can lead to new burdens and additional stress [5]. In addition, there is a risk of reducing employee loyalty to the company and remote work, thus impacting employee motivation, to which many companies do not yet have structured answers [6].

Since a lack of motivation can have negative effects on job satisfaction, even burnout, and thus lead to efficiency losses and increased costs [7, 8], it is important for management to assess the effects of digitalisation on job satisfaction and motivation in order to be able to counteract negative effects. Therefore, this study looks at the effect of digitalisation and, in particular, digital communication in home office solutions, among others, on employees' motivation. For this purpose, a sample of 92 employees, as diverse as possible, who are exposed to digital changes were asked for their assessments by means of a questionnaire. The answers were then analysed to see what effects the type and frequency of digital communication have on general motivation. Other motivation-relevant aspects were also queried, such as salary and promotion opportunities. This served to prevent an overestimation of the effects of digitalisation. One of the main results is that at least no fundamentally negative effect of increasingly electronic communication on work motivation was found, although hybrid solutions are preferred to purely electronic ones. In addition, it also becomes clear that digitisation in the course of the COVID pandemic has so far concentrated mainly on communication and data exchange, but not yet on more complex digital cooperation solutions.

2. Changing the Workplace through Digitalisation

Driven by technological progress, new forms of workplace design and communication are constantly emerging. Solutions such as the home office or "remote work" play a central role. As a result, communication is increasingly digital and ensuring accessibility at variable work locations is becoming more important [9]. However, these digital communication options are also increasingly used at the workplace in the company, so the associated advantages, but also the disadvantages, occur at all possible work locations [10]. This section therefore first presents the flexible workplace designs and their effects, and then aspects of digital communication in general.

Home Office Solutions and "Remote Work"

In addition to the automation of production and logistics processes, which is not considered further here, digital transformation particularly affects communication. In the search for possible uses for new technologies, agile action is increasingly required, i.e. the ability to adapt to changing conditions [11]. In this context, concepts such as home office or "remote work" are not new [e.g. 12], but are increasingly evolving. The flexibility this brings is viewed positively by many employees, even if it also brings challenges, such as making it more difficult to separate work and leisure and putting strain on families [13]. In addition, research findings vary considerably in terms of productivity gains from digitally-enabled work flexibility. This ranges from a significant positive correlation between the adoption of remote work and motivation [14] to finding productivity losses [e.g. 15]. Nevertheless, "remote work" is increasingly developing into "flexible work", which includes time flexibility in addition to the spatial one - both coveted by many young employees [16]. Although this does not yet correspond to the more far-reaching definition of the ideally meaningful and fulfilling "new work" in the definition by Bergmann [17], it represents a further developmental step.

However, the success of introducing flexible solutions from the perspective of both employers and employees also depends on how they are introduced and supported, as well as on the solutions chosen. For example, increased home office work can lead to a reduction in employees' social contacts, and there are links between flexible workplace solutions and demographic inequality and status-related aspects [18, 19]. In addition to the benefits sought through the introduction of remote work, such as increased flexibility and reduced costs, disadvantages can also arise, such as new dependencies, control problems and abuse of trust [20].

To avoid such effects, careful planning and conscious management of the introduction process is important. A key role is to provide the necessary resources and infrastructure for communication [6]. Another aspect is ensuring the involvement of employees in the company. Vartiainen and Hyrkkänen [21] describe physical and virtual space as necessary elements of a workplace, but also space for social exchange. Whether this takes the form of regular, physical meetings or as part of the general design of the work is irrelevant, but at least some hybrid content can be beneficial and is also generally viewed positively by employees and management [22].

Challenges Posed by Electronic Communication

Regardless of the workplace design, the same digital communication tools are used. Essentially, these are emails, internal company platforms and video meetings [11]. The aim here, as with home office solutions, is to reduce costs (e.g. travel costs) and at the same time increase efficiency, e.g. through uniform forms of communication [23]. In addition, digital communication makes it possible to work digitally across spatial boundaries and to develop solutions together [24]. Electronic exchange of information is an important factor in the project management of spatially distributed teams: effective communication promotes the

success of the project, provided employees are given freedom in the use of the different communication means and the necessary training [25].

A prerequisite for effective digital communication is the adaptation of organisational structures and processes. Here, too, it has also proven effective to involve employees in the design at an early stage [11] in order to explain the necessity of the change and to create acceptance. This process of involving employees in the transformation process, referred to by Safar [23] as "active change communication" (p. 61), serves to clarify uncertainties and reduce concerns.

Notwithstanding, these structures can have both positive and negative effects on the health and well-being of employees [26]. This relates in particular to the flexibility of work, the lack of social contacts, problems with cooperation, the constant accessibility employees experience and the associated information overload. Even when employees support the goals and understand the benefits of introducing digital communication, such as during the Corona pandemic, stress and anxiety can arise [5]. Moreover, the constant use of electronic means of communication leads to both the loss of content that can only be conveyed in person [27] as well as to misinterpretation and signs of fatigue - Bailenson [10] speaks of "zoom fatigue" in this context.

Another relevant aspect is that different groups of people or companies use electronic communication tools differently. While on average they are viewed positively [28], smaller companies have greater concerns and different challenges with adoption than larger ones [29] and younger people are much more open to new media than older workers [30, 31]. This aspect is important when interpreting results on motivation and is one reason why participants as diverse as possible were interviewed for this study.

3. Relevant Aspects of Motivation at Work

It is generally accepted that motivated employees usually perform better and thus contribute to the success of their organisation. Work motivation is based on the circumstances and conditions in the workplace that ensure that employees pursue organisational goals, work productively and feel good at work [7]. Motivation describes a temporally limited orientation of behaviour towards a specific goal. It can arise from various motives, such as the desire for power, acceptance or belonging. However, the decisive factors for work motivation are essentially incentives, which can only be partially influenced by the employer [32]. Factors that exert an external influence on the employee are referred to as extrinsic, like for example, remuneration, recognition by the management or workplace conditions. Intrinsic motivation, on the other hand, arises from the existing personal interest in an activity. This arises when a task gives pleasure, leads

to desirable outcomes or is related to personal values [33]. It should be noted that an extrinsic incentive may reduce the intrinsic interest in the activity [34].

Motivational Theories as the Basis

Motivated employees and business success correlate [35], but there are very different views on how motivation arises. This paper follows the differentiation of motivation theories between content and process theories. While content theories aim to examine the original motive and goal for a person's behaviour as an object, process theories consider the individual as a subject who makes rational decisions based on expectations towards efforts and outcomes. The focus is particularly on the cognitive processes and the resulting behaviour and people act in a benefit-oriented way [32]. No theory is undisputed. Nevertheless, some theories are presented here as examples to illustrate which factors can be relevant to this research and why. These were then taken into account in the design of the questionnaire.

Content theories of motivation are based on the assumption that dissatisfaction and satisfaction do not represent contrary states on a bipolar scale; they are considered independent of each other. Herzberg [36], for example, assumes that job satisfaction and job dissatisfaction are not opposing states but represent different dimensions. He thus distinguishes between four states of motivation: dissatisfaction, no dissatisfaction, satisfaction and non-satisfaction. These are influenced by motivators on the one hand and hygiene factors (the lack of which can cause dissatisfaction) on the other. Hygiene factors include, in particular, working conditions, interpersonal relationships in the workplace, internal corporate culture, rewards and job security. According to this, employees cannot be motivated directly by managers or external circumstances such as digital equipment. Rather, a basis must be created through the corporate culture, atmosphere and structure of the processes that enable employees to motivate themselves intrinsically on the basis of the activity [37].

Another content theory is the ERG theory according to [38], who further developed Maslow's pyramid of needs of 1954. This theory builds on the assumption that motivation is based on the three central needs of existence, relationships and growth. In contrast to Maslow, however, they do not build on each other but can be present simultaneously. While the existence needs, for example, monetary rewards, are directed at material and physiological needs for security; the relational needs include interpersonal relationships and social contacts, for example, the feeling of cohesion and consideration. The simultaneity of such needs is relevant in the design of motivating workplaces, as is Alderfer's statement that needs become dominant if they are not fulfilled, and thus take precedence. The relevant motivating factors also include the behaviour of management, e.g. by showing appreciation,

which can have a significant influence on employees' work performance [39].

McClelland's achievement motivation theory, on the other hand, assumes that human action cannot be traced back to individual motives, but consists of basic motives that are learned. He distinguishes between achievement motives, power motives and relationship motives. The degree to which these are expressed varies from person to person, but determines what is perceived as motivating by a particular individual [40]. People with a strong power motive, for example, often choose management positions in which they have a high degree of creative freedom. McClelland adds to this the avoidance motive, i.e. striving to avoid failure and loss of power or of recognition [37].

Process based theories, on the other hand, look at the procedural structures and cognitive processes of goal-directed action. The focus is thus on the aspects of goal setting, goal attainment and final reflection, which can be achieved through specific behaviour and which take place in consideration of the expected results. These include, for example, Vroom's VIE theory in which motivation is the result of a rational "calculation" [41] or goal-setting theory, according to which employees with clear goals perform better than others [42]. However, since complex decision-making processes lie behind the responses to incentives in these models, these theories are not relevant to the present work to the same extent as content theories. Observing or assessing these processes would require a more comprehensive and longer study than planned here. Relevant for the discussion of the results, however, is the aspect that a delay between the execution of an action and the consequences of this action influences motivation. For example, the motivational factor of wage receipt depends on the time lag between the execution of the performance and the receipt [43].

Digitalisation, Motivation and the Aim of the Study

As shown above, digital work and communication tools have empowering effects on employees on the one hand, but on the other hand, content loss and stress factors have to be taken into account. Although some studies suggest that video communication allows richer, cognitive content, most elements of non-verbal communication are missing [10]. Implementing digital work also requires extensive preparation. Mitterweger and Wellhöfer [44], for example, recommend paying attention to five aspects: the competencies of employees (skills), the burden on employees (e.g. through increased amounts of information and associated extra work), the change in the company itself in terms of structure and processes, data protection and the intrinsic prerequisites of employees, i.e. acceptance and willingness to support the changes. However, this can change: some results suggest that independent work in the home office may bring about an increase in autonomy and one's own professional competencies, but in contrast,

intrinsic motivation and productivity can decrease. Amongst other factors, this might be due to the detachment from the office community [45].

Productivity losses can also result from unmanaged or even pre-determined work, and hybrid solutions - consisting of home office work as well as working in the office where communication is possible in person - seem to have better motivational effects and show fewer productivity losses than pure "remote" solutions [46]. In this context, Waizenegger, McKenna, Cai and Bendz [5, p. 439] speak of the "double-edged sword" of telework - on the one hand, it enables people such as project managers to work in a more organised, distributed way and to improve cooperation in the (distributed) team, but on the other hand, the symptoms of fatigue already described can occur. Maintaining contacts and networking may also be more effective with personal exchange, but they are certainly more motivating.

Moreover, the COVID pandemic has shown that there is not always enough time to prepare for change. If electronic communication becomes part of crisis management, there are also "best practices" that help to reduce negative effects such as loss of information [27]. However, most of the preparatory activities already mentioned to ensure staff motivation require more time than is available during crises. A consideration of the general motivational effects of digital communication is therefore helpful information for management.

The aim of this study is therefore to gain insights into whether digitisation of the workplace - with a focus on digital communication, especially in the home office - influences employees' motivation to work. On the one hand, the influence of employees who already work at least partially digitally is considered, but also whether the lack of such flexibility options has a negative effect. In addition, it will be examined whether a hybrid work model can have a positive effect on work motivation. The ultimate goal is to be able to give a recommendation for action for companies, especially those with little experience with employee motivation in the context of digitalisation projects or home office solutions.

4. Methodology

The present work was subject to time restrictions. In order to achieve the goal of initial findings relatively quickly, a target of approximately 100 participants was set. This was pragmatically assessed as achievable within the available time frame by using personal contacts. Since the collected data are largely based on personal assessments and experiences, a qualitative approach was chosen. Therefore, beyond frequencies, no figures are analysed. As changes, including those in crises such as COVID-19, are also an emotional experience, a qualitative approach is appropriate and may also yield surprising results that cannot be derived from statistics [47].

Means of Data Collection

To ensure high response rates, a questionnaire was designed so that answering was possible in less than 10 minutes, which was tested on five people who later did not participate in the survey. The questionnaire contained a total of 16 questions. Free-text questions were avoided as much as possible in order to shorten the response time. Thus, there was only one open question in the main part (on, if applicable, why home office is not possible in the company) and the last two, optional questions on other comments on the topic.

The first four questions concern demographic data. The subsequent main part comprised ten questions, either with multiple-choice answering options or with the option of rating several statements such as "I know what is expected of me" on a five-point Likert scale. The main part focused on questions on the use of digital communication and home office work, self-organisation options and the effects of the changes on working in a team and with superiors. It also asked about the proportion of digital work and inquired about the participants' ideal ideas in this regard.

The last two questions took up the aspects of motivation discussed above. First, an attempt is made to determine the degree of current work motivation. On the one hand, we asked for an assessment of one's own motivation and well-being at work, but also for the presence of some motivators and hygiene factors (based on Herzberg [36]), specifically praise, clear expectations, the possibility of meeting deadlines or time pressure and the perceived importance of one's own role. These aspects are representative of many others and served as a general assessment of whether participants feel "motivated" – and to what extent. Finally, participants were asked to rate their satisfaction with a number of variables such as performance, praise, general work situation or infrastructure. Both extrinsic and intrinsic factors are taken into account. These questions serve to get an impression of which factors besides digitalisation could have an influence on the participants' motivation to work.

The subsequent analysis is purely qualitative, also because a clear, mathematical separation of the above-mentioned effects is not possible on the basis of the sample. Although the results of the first and second part of the main section could also be evaluated statistically in part, this was judged to be insufficiently meaningful due to the small number of participants (for a confidence level of 95% with a margin of error of 5%, for example, a number of participants of approx. 385 would have been necessary), and to be able to discuss the variety of considered and otherwise conceivable influences on motivation in detail would have required a more extensive approach.

Microsoft Forms was used to create the questionnaire. Although face-to-face interviews offer more chances to build trust and a relationship with the interviewee [48], it was also decided to simply send the questionnaires for answering. The channels used for this were social media such as WhatsApp and Instagram. In the first step, a pilot test was sent to seven personally known participants, and the questionnaire or the electronic implementation of the processing was adapted according to the results. Then, the questionnaire was put online for four weeks and the invitations to participate were sent out. The invitations contained an introductory text with an explanation of the purpose of the survey and information on anonymity and the use of the data. According to feedback from participants, it took about five minutes on average to complete, with a response of 92 out of 110.

Data collection and Sampling

As existing work experience and exposure to electronic means of communication were necessary to answer the questions, the survey was aimed at office employees with at least one year of work experience. While age specifications were not made, the aim was to reach, within the target group, as diverse a sample of participants as possible, all, however, in Germany. For this purpose, personal contacts from different age groups, types of companies and with differently designed workplaces were approached first, including people without home office experience. In addition, participants were requested to forward the calls to their acquaintances in order to achieve a "snowballing" effect.

The goals regarding response rate and participant structure were largely achieved. The total of 92 participants was roughly half female and half male (no one "diverse"), with ages ranging from 18 to 62. However, about half of the participants were between 20 and 25 years old. This is relevant for the interpretation of the results due to the greater openness of younger workers to digital solutions discussed in 2.2. The majority of respondents, however, were between 26 and 50 years old, and the average age was 32,2 which is about ten years below the German average [49].

Accordingly, the professional experience of most participants (59%) is between one and five years, 4% stated that they had no professional experience. However, the results of these participants could not be taken out of consideration of the figures, but should not significantly distort the overall picture due to their small number. About 40% of the participants have between seven and 40 years of work experience. In terms of position, 46% of the participants stated that they had a permanent full-time job (including four young professionals), 29% worked as interns or temporary workers. 9% were in training and the remaining participants were either self-employed or - in the majority - in management positions. Thus, the planned diversity among the participants was achieved, even though with a large share of younger workers.

5. Findings and Discussion

This section will first look at the current situation at work and digitalisation-related preferences, and then at the discerned effects on motivation.

Home office options and employee preferences

First, the current possibilities of the respondents and the wishes associated with home office or "remote work" were asked. The vast majority of respondents stated that they could work in a home office. Only 4% work in companies that do not offer this option, although it would make sense from the respondents' point of view. Just under a quarter cannot work remotely because the type of work does not allow this, see Table 1. The participants could give reasons for this; the majority of them work in location-based trade and personal services.

Table 1: Possibility of working in a home office (N=92)

Opportunities for working from home	Share of Participants
Working from home not permitted	4%
Working from home not possible because of the nature of the participant's work	24%
Working from home possible already before the pandemic	34%
Working from home made possible because of pandemic-related measures	38%

What is striking is the large proportion of respondents whose companies' home office options were only created as a reaction to the pandemic. This confirms observations made elsewhere [e.g. 1]. The high proportion of participants who already have home office experience is also important for the relevance of the following answers. However, it is higher than the German average of about 25% [50], which may also be due to sampling bias (where possible, potential participants were approached who were known to have relevant experience).

Table 2 shows the percentage of respondents by days per week that are actually working remotely as well as the desired value stated by the participants in this regard. It is particularly striking that a large majority would like to work remotely at least some of the time. This confirms current data: in 2018, the proportion of employees who wanted home office options was 20%; currently, it is around half [51]. The higher proportion in this survey may be due, among other things, to the fact that, as shown, the proportion of young participants who are more open to digital and remote working [31] is significantly higher than the German average.

Table 2: Home office days per week, actual and desired value and deviation (N=92)

Number of days of WFH	As is	Preferred	Deviation
None	37%	13%	24%
1 day	12%	26%	-14%
2 days	14%	23%	-9%
3 days	18%	24%	-6%
4 days	8%	9%	-1%
5 or more days	11%	5%	6%

(WFH = working from home)

However, the table also shows that only a few respondents would like to work 4 or more days in a home office. This confirms findings such as Messenger, Llave [46] and [27] that despite the advantages employees see in digital and "remote work" solutions, a certain amount of presence is still desired. This is also confirmed by the direct question about preferences in the format of communication: 37% of participants generally prefer face-to-face meetings, only 11% prefer purely digital communication and 52% want hybrid forms. Nevertheless, digital work is seen positively, 75% of the participants stated that digital tools make their tasks easier at least to some extent, 13% saw the effects neutrally. Only 12% saw negative effects, but without specifying which ones. A connection with the challenges and stress factors caused by digitalisation described in 2.2 is at least possible. In general, however, the results confirm [28], who report mostly positive experiences with digital communication.

The participants were also asked which means of communication they mainly use for digital work, whereby multiple answers were possible and thus 187 answers were available from the 92 participants. It is noticeable that pure data exchange is still the predominant variant of electronic collaboration: e-mail (71 answers) and the storage of data on shared data carriers (45) were named significantly more frequently than platforms that allow joint and simultaneous processing (34) or company-specific collaboration solutions (9). 28 participants even stated that they also use or exchange paper-based information in the context of the home office.

This suggests that the measures to ensure successful implementation, such as those described and recommended by Ternès and Englert [11] or Safar [23], were not or only partially followed during the introduction of new forms of work. Due to the high proportion of participants whose companies only made remote work possible with the COVID pandemic, this may also be due to the fact that the introduction there had to take place in a short time as a crisis management measure and thus with insufficient preparation. Due to the anonymous survey, it remains unclear which companies this could have affected.

It may be due to the advantages and disadvantages of the introduction of digital work and the home office discussed above, yet the result of the question on cooperation with superiors is surprising: apparently the change in the quality of cooperation is largely neutral. 62% of the respondents see no difference, of the others 23% see a negative and 15% a positive change. As many as four participants even see a significant improvement in cooperation, although some respondents also indicate a significant deterioration. Nevertheless, the results show satisfaction with the situation on average. As shown, the home office creates new challenges in cooperation for both employees and supervisors [13, 20], but at least up to the time of the survey, this seems to have been addressed in a satisfactory manner.

Effects on motivation

As described above, it is first determined whether the participants feel motivated and, based on the question about the presence of some motivators and hygiene factors such as praise, clear expectations, the possibility of meeting deadlines or time pressure and perceived importance of one's own role, whether the description of the environment confirms these self-assessments. On a five-point Likert scale, the factors for self-assessment of motivation resulted in values between approx. 3.6 and 3.9. Accordingly, the participants assessed themselves as motivated on average (corresponding to "largely true"). The most frequently mentioned value was "4" in all cases, the rarest "2". Some less satisfied participants stated "does not apply at all" and thus lower the mean value, but many fives show the picture of a largely motivated and satisfied sample.

This is confirmed by the fact that, according to the respondents, the above-mentioned motivating factors are largely present (values between approx. 3.6 and 4.2); only in the case of praise do 45% state that it does not occur to a sufficient extent. The frequencies of the statements on motivation and well-being with simultaneously high values for clear expectations - which would confirm the assessments of McClelland [37] - and the assessment of the importance of one's own work (as would also be shown by calculated correlations) also suggest a participant group that on average has a positive attitude towards work and performance and also experiences motivation through this.

The next step is to examine whether there are recognisable correlations between motivation according to self-assessment and the following factors already presented in the last section:
- Possibility to work in a home office or remotely
- Frequency of work away from the office
- Assessment of the change in cooperation with superiors

The difference in perceived motivation is largely the same for all groups with home office options or the group that cannot work remotely due to their job. Only the respondents who consider digital working possible and

useful, but are not allowed to do so, are visibly less motivated: the result is close to the (neutral) average self-assessment value of three, and for the other groups close to the positive value of four. The desire for at least partially offered opportunities for remote work [see also 28, 45, 52] is thus recognisable. No meaningful pattern can be discerned when comparing the motivation values with the digitally worked days.

What is clear, however, is the correlation between the improvement in collaboration after the introduction of digital working and perceived motivation, which confirms that it is not only important whether home office and digital working are made possible, but also how the introduction has worked and what the implementation looks like [44]. However, the picture regarding the causal relationship between the introduction of remote working and high motivation is not as clear as in Toscano and Zappalà [14], and subsequently, other factors that may have led to the high motivation of participants are considered.

Table 2: Home office days per week, actual and desired value and deviation (N=92)

Influence on Motivation			
Potential motivational factors in general	**High to very high**	**Medium influence**	**Low to very low**
Regular feedback	62%	26%	12%
Career opportunities	63%	24%	13%
Salary	78%	17%	5%
Training opportunities	59%	27%	14%
Appreciation by superiors	83%	11%	6%
Potential motivational factors around digitalisation	**High to very high**	**Medium influence**	**Low to very low**
Technical equipment	63%	22%	15%
Flexible working times	75%	15%	10%
Autonomy at work	76%	22%	2%

The factors with the strongest effect according to the participants were, in addition to general factors such as salary and appreciation by superiors, also the aspects of autonomy and flexible time management associated with digitalisation. Interestingly, the quality of the technical equipment also plays an important role. This might be linked to how this supports the other motivational factors. Even if academic research still remains sparse, grey literature material can be found, and surveys support this result and show that a large proportion of the people who worked in a home office during the pandemic would also like to continue doing so [53, 54].

The results thus support that the advantages of

digitalisation and the associated possibilities of remote working offer attractive, new opportunities for employees and can also be an option for employers to position themselves successfully in the "war for talent" [16]. However, the results of the free-text question, which a total of 26 participants used, show that this should also be linked to opportunities for personal exchange: almost all of the respondents named aspects of interpersonal relationships as important for motivation, for example "exchange", "personal interaction" and "team".

6. Conclusion, Limitations and Suggestions for Next Steps

The study shows that despite - also due to the pandemic - increasing use of digitally supported remote work, many work steps still represent a simple data exchange. On the one hand, this may be due to the fact that the digital solutions had to be introduced under time pressure during the crisis, but on the other hand, the results also indicate that, at least for employees, flexibility and autonomy appear to be more important than the actual, digital process support. In this case, companies would have to actively push this aspect to the fore in order to be able to leverage the benefits of technological development. The COVID pandemic has accelerated digitisation [1], but at least for the participants in this study, it appears to be only in the area of information exchange and less with real, digital collaboration tools.

In general, the individual differences in the answers also show that the situation and motivation of the participants are very different. Which companies prepared and carried out the introduction of digital and remote work how well - and which aspects they paid attention to - remains anonymous, but large differences depending on the acting persons and companies are common [see 55].

However, the results show that a pure remote solution seems to be less attractive than a hybrid one, a finding that is also found in other studies from both employer and employee perspectives [23, 26, 45]. It also shows that companies run the risk of creating negative motivational influences if no digital or home office options are offered, at least if the activities seem suitable from the employee's perspective, which is true for about 60-70% of workplaces, depending on the source, but is deliberately not implemented by many supervisors [56].

The present study takes into account the data of a relatively small sample, which is also younger on average than the average German employee, and thus assesses some aspects differently, confirming Andresen, Lips [31] and Cabell, Wood [30]. Information on self-assessment of motivation, among other things, is also requested, which can only be answered subjectively, and the influence of social desirability cannot be ruled out in the answers. The results must therefore be analysed with caution and can only indicate tendencies, all the more so as an exact assignment of motivation influences in addition to digitalisation could not be carried out on the basis of the available data.

A positive motivational effect from the introduction of digitalisation and remote working alone cannot be clearly deduced from the available data. The question is obviously not only whether digitisation is introduced, but also how. The results lead to the recommendation to companies to continue to treat motivation in the introduction of digitalisation as a complex construct dependent on many factors, to plan the introduction of new forms of work more meticulously than has been done so far, at least on average, and to take personal aspects of employees into account. Digitisation can be motivating, but it is not equally suitable for every person and poses risks to efficiency and well-being [13, 26]. Moreover, even when satisfying desires such as flexibility, other factors such as salary and appreciation remain important.

The work also offers some approaches for further studies, such as clarifying why hybrid forms are more popular and what advantages employees and employers see in them. Publication in the media in particular show that many managers would like to reduce remote working options again after the end of the pandemic in order to be able to exercise better control and to limit "bumming around" [57]. In turn, some papers show that even opposite effects such as the autonomy paradox can occur [58]: self-regulating employees in some cases even tend to work more instead of less. The results on productivity in digital remote working are still inconclusive [27] and require further investigation.

A relevant aspect can also be whether the digital solutions only concern the exchange of information or represent more complex collaboration solutions, and why this is so. No less important for companies, however, is differentiation in the labour market, especially among younger, tech-savvy workers seeking flexibility [16, 30] - a challenge for which the offer of thoughtfully introduced, digital or digitally supported remote working can be attractive and motivating.

7. Acknowledgements

8. References

[1] Stürz, R., et al., *Digitalisierung durch Corona.* 2020, bidt Institute, Bavarian Academy of Science.
[2] Priyono, A., A. Moin, and V.N.A.O. Putri, *Identifying Digital Transformation Paths in the Business Model of SMEs during the COVID-19 Pandemic.* Journal of Open Innovation: Technology, Market, and Complexity, 2020. **6**(4): p. 104.
[3] John, J.D. and R. Thakur, Long term effects of service adaptations made under pandemic conditions: the new post

COVID-19 normal. European Journal of Marketing, 2021: p. 1679-1700.

[4] statista, Remote work in Germany. 2022 https://www.statista.com/study/108858/remote-work-in-ger many/. Accessed April 28th, 2022.

[5] Waizenegger, L., et al., An affordance perspective of team collaboration and enforced working from home during COVID-19. European Journal of Information Systems, 2020. **29**(4): p. 429-442.

[6] Landes, M., et al., Führung von Mitarbeitenden im Home Office. Umgang mit dem Heimarbeitsplatz aus psychologischer und ökonomischer Perspektive. Essentials. 2020, Wiesbaden: Springer Gabler.

[7] Kauffeld, S. and C. Schermuly, *Arbeitszufriedenheit und Arbeitsmotivation*, in *Arbeits-, Organisations- und Personalpsychologie* S. Kauffeld, Editor. 2011, Springer: Berlin. p. 179-194.

[8] Felfe, J., Die Relation von Arbeitszufriedenheit und Commitment, in Arbeitszufriedenheit: Konzepte und empirische Befunde L. Fischer, Editor. 2006, Hogrefe: Göttingen. p. 37-60.

[9] Yang, L., et al., The effects of remote work on collaboration among information workers. Nature Human Behaviour, 2021. **6**: p. 43-54.

[10] Bailenson, J.N., *Nonverbal overload: A theoretical argument for the causes of Zoom fatigue.* APA Open, Technology, Mind and Behavior, 2021. **Vol. 2**(Issue 1).

[11] Ternès, A. and M. Englert, Digitale Unternehmensführung. Kommunikationsstrategien für ein exzellentes Management. 2019, Wiesbaden: Springer Gabler.

[12] Olson, M.H., *Remote office work: changing work patterns in space and time.* Communications of the ACM, 1983. **26**(3): p. 182-187.

[13] Eddleston, K. and J. Mulki, Toward Understanding Remote Workers Management of Work-Family Boundaries: The Complexity of Workplace Embeddedness. Group & Organization Management, 2017. **42**: p. 346 - 387.

[14] Toscano, F. and S. Zappalà, Overall Job Performance, Remote Work Engagement, Living With Children, and Remote Work Productivity During the COVID-19 Pandemic: A Mediated Moderation Model. European Journal of Psychology Open, 2021. **80**: p. 133-142.

[15] Filges, T. *Arbeiten im Homeoffice steigere die Produktivität, sagen Angestellte — eine Studie hat nun das Gegenteil herausgefunden.* Business Insider 2021 [April 25th, 2021]; Available from: https://www.businessinsider.de/wirtschaft/arbeiten-im-home office-steigere-die-produktivitaet-sagen-angestellte-eine-stud ie-hat-nun-das-gegenteil-herausgefunden-b/.

[16] Hafshah, R.N., et al., The Impact of Remote Work During COVID-19 Pandemic on Millennial Employee Performance: Evidence from the Indonesian Banking Industry. Journal of Insurance and Financial Management, 2022. **7**(2): p. 15-39.

[17] Bergmann, F., *New work new culture.* New Zero Books Edition ed. 2019: John Hunt Publishing.

[18] Klain, R. *Inequality and the Internet.* 2015 [December 14th, 2020]; Available from: http://www.democracyjournal.org/36/our-digital-future.php.

[19] Barsness, Z.I., K.A. Diekmann, and M.-D.L. Seidel, Motivation and Opportunity: The Role of Remote Work, Demographic Dissimilarity, and Social Network Centrality in Impression Management. Academy of Management Journal, 2005. **48**(3): p. 401-419.

[20] Entschew, E.M. and A. Suchanek, *Digital Communication: A New Challenge for Moral Discernment* Zeitschrift für Wirtschafts- und Unternehmensethik, 2017. **18**(3): p. 347-369.

[21] Vartiainen, M. and U. Hyrkkänen, *Changing requirements and mental workload factors in mobile multi-locational work.* New Technology, Work and Employment, 2010. **25**(2): p. 117-135.

[22] Fuchs, O., S. Weissleder, and M. Najmaei, *A Probing German Case Study on Trust Building Factors Around Online Leadership in Virtual Work Environments.* International Journal of Business and Management, 2022. **6 (4)**: p. 30-39.

[23] Safar, M., Digital Workforce: Auf dem Weg zur hybriden Belegschaft – Wie Sie im Unternehmen eine digitale Workforce aufbauen. Digitale Welt, 2022. **6**(2): p. 59-61.

[24] Mars-Matzke, M., *Wie Technologie den Arbeitsplatz verändert.* Digitale Welt, 2022. **6**(2): p. 61-62.

[25] Zając, J., Towards successful communication in global virtual teams: team language and team culture. . Kwartalnik Neofilologiczny, 2012. **LIX**(3): p. 345-370.

[26] Potter, R.E., et al., *Digital communication, health & wellbeing in universities: a double-edged sword.* Journal of Higher Education Policy and Management, 2022. **44**(1): p. 72-89.

[27] Fuchs, O., Improved Practices for Client Contact Management in a Crisis During Restrictions on Personal Contact as caused by Covid-19, in Edinburgh Business School. 2022, Heriot-Watt University: Edinburgh.

[28] Baert, S., et al., The COVID-19 Crisis and Telework: A Research Survey on Experiences, Expectations and Hopes, in IZA Discussion Paper Series. 2020, Institute of Labor Economics.

[29] Meroño-Cerdán, Á.L., Perceived benefits of and barriers to the adoption of teleworking: peculiarities of Spanish family firms. Behaviour & Information Technology, 2017. **36**: p. 63 - 74.

[30] Cabell, J., et al., Staying in touch during COVID-19: How communication methods varied by age and COVID-related experiences. Qualitative Research Reports in Communication, 2022. Pre-publication: p. 1-13. DOI 10.1080/17459435.2021.2016921

[31] Andresen, S., et al., Erfahrungen und Perspektiven von jungen Menschen während der Corona-Maßnahmen. JuCo Surveys, 2020. **1**: p. 4-17.

[32] Heckhausen, H., *Entwicklungslinien der Motivationsforschung*, in *Motivation und Handeln*, J. Heckhausen and H. Heckhausen, Editors. 2018, Springer Berlin Heidelberg: Berlin, Heidelberg. p. 13-48.

[33] Giancola, F.L., *Should HR Professionals Devote More Time to Intrinsic Rewards?* Compensation & Benefits Review, 2014. **46**(1): p. 25-31.

[34] Kohn, A., *Why Incentive Plans Cannot Work.* Harvard Business Review, 1993. **71**(5): p. 54-63.

[35] Antoni, C.H., et al., *Reward Management.* Journal of Personnel Psychology, 2017. **16**(2): p. 57-60.

[36] Herzberg, F., *One more time: how do you motivate employees? .* Harvard Business Review, 2003. **81**(1).

[37] Lippold, D., *Theoretische Ansätze der Personalwirtschaft* 2nd ed. Essentials. 2019, Wiesbaden: Springer-Gabler.

[38] Alderfer, C.P., *An empirical test of a new theory of human needs.* Organizational Behavior and Human Performance, 1969. **4**(2): p. 142-175.

[39] Arnolds, C.A. and C. Boshoff, *Compensation, esteem valence and job performance: an empirical assessment of Alderfer's ERG theory.* The International Journal of Human Resource Management, 2002. **13**(4): p. 697-719.

[40] Winter, D.G., The motivational dimensions of leadership: Power, achievement, and affiliation, in Multiple intelligences and leadership. 2002, Lawrence Erlbaum Associates Publishers: Mahwah, NJ. p. 119-138.

[41] Lord, R.G., P.J. Hanges, and E.G. Godfrey, *Integrating*

neural networks into decision-making and motivational theory: Rethinking VIE theory. Canadian Psychology / Psychologie canadienne, 2003. **44**(1): p. 21-38.

[42] Latham, G.P. and E.A. Locke, *Enhancing the Benefits and Overcoming the Pitfalls of Goal Setting.* Organizational Dynamics, 2006. **35**(4): p. 332-340.

[43] Mayes, B.T., Incorporating Time-Lag Effects into the Expectancy Model of Motivation: A Reformulation of the Model The Academy of Management Review, 1998. **3**(2): p. 374-380.

[44] 44. Mitterweger, J. and L. Wellhöfer, *Die fünf Säulen der Digitalisierung*, in *Faszination New Work: 50 Impulse für die neue Arbeitswelt*, D. Brommer, S. Hockling, and A. Leopold, Editors. 2019, Springer Fachmedien: Wiesbaden. p. 79-86.

[45] 45. Rietveld, J.R., et al., Motivation and Productivity of Employees in Higher Education during the First Lockdown. Administrative Sciences, 2022. **12**(1): p. 1.

[46] 46. Messenger, J., et al., *Working anytime, anywhere: the effects on the world of work*. 2018, Publications Office of the EU.

[47] Teti, M., E. Schatz, and L. Liebenberg, *Methods in the Time of COVID-19: The Vital Role of Qualitative Inquiries.* International Journal of Qualitative Methods, 2020. **19**: p. 1-5.

[48] Clarke, A., Qualitative interviewing: encountering ethical issues and challenges. Nurse Res, 2006. **13**(4): p. 19-29.

[49] Stroh, M., *Zum Tag der Arbeit: Mehr als ein Drittel der Beschäftigten ist fünfzig Jahre und älter*. 2021, Statistisches Landesamt Baden-Württemberg / State Office for Statistics: Stuttgart.

[50] Statistisches_Bundesamt, *Ein Viertel aller Erwerbstätigen arbeitete 2021 im Homeoffice*. 2022, Federal Statistical Office of Germany.

[51] Flüter-Hoffmann, C. and O. Stetter, Home Office nach fast zwei Jahren Pandemie - Home office work after two years of pandemic, in IW Report. 2022, Institut der Deutschen Wirtschaft: Cologne.

[52] Shockley, K.M., et al., Remote worker communication during COVID-19: The role of quantity, quality, and supervisor expectation-setting. J Appl Psychol, 2021. **106**(10): p. 1466-1482.

[53] Sonnenschein, K., et al., "Make it possible for more people to work at home!" representations of employee motivation and job satisfaction in Danish and Norwegian newspapers during the COVID-19 pandemic. Frontiers in Psychology, 2022. **13**: p. 2-12.

[54] ntv_News. *Jeder sechste Beschäftigte will dauerhaft im Homeoffice bleiben* 2022 February 20th, 2022]; Available from:
https://www.n-tv.de/panorama/18-00-Jeder-sechste-Beschaeftigte-will-dauerhaft-im-Homeoffice-bleiben--article21626512.html.

[55] Mirandilla, K.A., J. Chia, and M. Peters. Decision Making in the Crisis Cycle: The need for Research and Better Understanding. in Power & Place: Refereed Proceedings of the Australian & New Zealand Communication Association Conference. 2008. Wellington.

[56] Mergener, A., *Homeoffice in Deutschland – Zugang, Nutzung und Regelung* Bundesinstitut für Berufsbildung Papers, 2020. BIBB-Preprint 2020.

[57] Wolf, L., German managers fear idling in the home office, in Die Welt. 2021: Hamburg.

[58] Curzi, Y., T. Fabbri, and B. Pistoresi, *The stressful implications of remote e-working: Evidence from Europe.* International Journal of Biometrics, 2020. **15**: p. 108-119.