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WORKERS' ATTITUDES TOWARDS DIGITAL TRANSFORMATION AND PERCEIVED WELL-BEING AT WORK: A CASE STUDY

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Abstract

This study examines workers' attitudes toward digital transformation and job well-being in the semiconductor industry, focusing on a major German manufacturer, to identify ergonomic and managerial potentials for improvement. Through a standardized paper survey of 46 skilled workers in 2021, it explores the impact of automation and digitalization on well-being and the influence of job characteristics and attitudes on workers' behavior. For confirmatory hypothesis testing, Pearson's correlation coefficient was calculated between the variables. The results show no direct link between company digitalization efforts and worker well-being. However, worker identification with their job and interest in new technologies positively correlate with willingness to embrace digital challenges and participate in further education. These findings suggest fostering job identification and tech interest can enhance engagement in digital initiatives, offering organizational insights for navigating digital transformation.

Keywords

Semiconductor industry; Automation; Job characteristics; Technology commitment; Human factors; Mental and physical well-being.

Introduction

For more than a decade, automation and digitalization have been the driving factors behind the so-called Industry 4.0 (Kagermann et al., 2013). Although most of the companies in Germany and other European countries have not yet adopted I4.0 concepts as much as expected (Handelsblatt Research Institute, 2022), the implications for companies are manifold. For example, the introduction of I4.0 technologies and approaches can also have negative side effects, especially for workers on the shop floor. Along with increased automation and digitalization efforts, such as the use of robots and artificial intelligence (AI) in manufacturing, many of them may experience a lack of workplace skills or fear of job loss (Keil et al., 2020).

So far, the research on and adoption of I4.0 technologies like augmented reality (AR) has focused heavily on technological aspects (Mühlan et al., 2021). However, social considerations are expected to be at least as important in such change management processes (Richter et al., 2018). The recent concept of Industry 5.0 (I5.0) points to the need to further

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explore the social, ergonomic, and individual aspects of workers in cyber-physical production systems to design human-centered workplaces that optimally combine both human and machine capabilities (Maddikunta et al., 2022).

Semiconductors form the basis of almost every modern technology, making semiconductor manufacturing itself one of the most innovative and complex industries. It is characterized by capital- and cost-intensive investment in plant and equipment, while the production of a computer chip can involve up to 1,000 process steps and take up to three months to ship (Keil, 2012). To remain competitive, manufacturers must constantly adapt to new technologies, optimize their operations, and reduce costs through automation and digitalization. The semiconductor industry is therefore a promising area to explore how workers in this industry feel affected by increased automation and digitalization.

The rest of this article is structured as follows: First, an overview of the current research background on automation and digital transformation in the semiconductor industry (Section 1.1) and on human factors related to technology acceptance and well-being (Section 1.2) is presented. On this basis, research hypotheses are derived (Section 2), and the applied survey method and analyses are described in Section 3. The results of the confirmatory hypothesis tests are then presented (Section 4) and their implications for answering the RQs are discussed (Section 5). This includes comparing the findings with the current literature, highlighting the limitations of our study (Section 5.1), and suggesting future avenues for research in this area (Section 5.2), before concluding on the relevance of the findings.

1 Theoretical Background

In the following, we briefly review the current literature and research gaps on automation and digital transformation in the semiconductor industry, as well as the role of employee well-being and technology acceptance as the rationale for our research.

1.1 Automation and Digital Transformation in the Semiconductor Industry

With the invention of the steam engine, the conveyor belt, electronics, sensors, and actuators, manual labor was first mechanized and then automated, enabling mass production at affordable prices. At the same time, these industrial revolutions have had profound impact on the way we work and live (Britannica, 2024).

With the advent of computers, modern information and communication technology (ICT), and now artificial intelligence (AI), information has been further digitized, jobs have been digitalized, and business have digitally transformed (Brynjolfsson & McAfee, 2014). While digitization refers to the one-to-one process of transforming analogue to digital processes (Gartner, Inc., 2024), digitalization further encompasses changes in the characteristics of the processes, tasks, or jobs as well (Muro et al., 2017), and digital transformation includes the application of new business models on top (MIT Center for Digital Business & Capgemini Consulting, 2011).

In our work, we use the term digital transformation when referring to the general economic, organizational, and operational efforts of the company to transform and adapt its business to the digital age, as it is also the case for Infineon Dresden, our case company. However, when relating to the employees of Infineon, we have used the term digitalization, as this is what directly affects their jobs and workplaces and what they directly experience.

The semiconductor industry is one of today's key global industries. Its chips and components are required for almost every modern technology. At the same time, semiconductor-manufacturing processes are complex, resource, time, and cost-intensive (Bureau et al., 2006).

Some semiconductor manufacturers follow Moore's Law, which aims to double the number of integrated circuits per chip each year (Mack, 2011). Others follow a strategy called "more than Moore", focusing on different technologies and a broader product portfolio. However, both approaches require constant changes in processes and equipment, supported by automation of process steps and digitalization of workplaces. For example, in modern semiconductor factories, factory workers are less likely to be required to lift or move heavy objects such as lots of chip wafers. Instead, their activities are shifting towards monitoring and control tasks (Keil et al., 2020). This affects not only workers on the shop floor, but also business and administrative processes (Schneider et al., 2021).

However, the role of the human worker as part of a highly automated and digitalized environment has not yet been analyzed in depth and requires further study (Schneider et al., 2022; von der Weth et al., 2022). This semiconductor manufacturing environment, where constant change through automation and digitalization has become commonplace, therefore seems well suited to investigate the effects of digitalization in the workplace on workers' attitudes.

1.2 Human Factors Concerning Technology Acceptance and Well-being

Human factors and ergonomics refer to the psychological, emotional, and social factors that influence socio-technical work systems and the human-machine interaction. Through the thorough design of work tasks, workplaces, and assistance systems, human factors engineering can prevent errors and accidents (Hinsch & Olthoff, 2019), benefiting both the organization and the individual worker. Furthermore, the proper design of physical and mental work can keep employees healthy, motivated, and committed to the organization (Büssing et al., 2004).

More recently, the notion of Industry 5.0 (I5.0) promotes, among other things, the worker-centered design of production systems and the targeted use of assistive technologies (de Nul et al., 2021). For example, Romero et al. (2016) distinguish several types of operators that can be individually supported by different technologies like exoskeletons, AR, virtual reality (VR), wearables, or collaborative robots. Therefore, in I5.0, it should be possible for technology not to be implemented for its own sake, but to be targeted and individually adapted to the personal needs and preferences of workers.

There are several approaches to assessing individuals' attitudes towards technology and their behavioral antecedents. The Technology Acceptance Model (TAM), for example, measures the behavioral intention of employees to use a specific information technology (IT) system at work, considering the perceived usability and usefulness of the system (Venkatesh & Bala, 2008). However, as in our case, we are not focusing on a single technology but on digitalization in the workplace in general, we are applying theoretical concepts from traditional work design for our purpose.

For example, in their Self-Determination Theory (SDT), Deci and Ryan (2014) state that autonomy, competence, and relatedness form the three basic needs that individuals strive for in their self-motivated behavior. Hackman and Oldham (1975) relate motivation, autonomy, and self-efficacy, among others, specifically to the work context. They operationalize them in their Job Diagnostic Survey (JDS) to assess psychological job characteristics and identify improvement potential for designing healthy workplaces. Based on these constructs, we derive hypotheses in the following section to be investigated in the case of automation and digitalization in the semiconductor industry.

2 Research Objectives and Hypotheses

As to the best of our knowledge the effects of digitalization and automation have not been specifically addressed in semiconductor workplaces, we want to contribute to the investigation of their sociological effects by analyzing secondary survey data from employees at a large German semiconductor manufacturer, Infineon Technologies Dresden GmbH & Co. KG (NACE class 26.11: Manufacture of electronic components; NACE Rev. 2.1, 2023). Infineon Dresden is characterized by a high level of automation and digitalization (Keil et al., 2020; Keil et al., 2019), particularly in the facility where 300 mm diameter silicon wafers are processed and where our research took place. Automation and digitalization are helping Infineon Dresden to standardize processes and minimize human error, avoiding potentially large economic losses. But how do workers react to such automation and digitalization efforts in their workplace?

To find answers to this question, our goal is to identify factors that correlate with employees' willingness to face the challenges of digitalization and automation. Such insights are essential for considering and deriving (counter-)measures from a managerial perspective to enhance workforce well-being. Therefore, our research questions (RQs) are:

- RQ1: *How do automation and digitalization in the workplace affect the well-being of factory workers?*
- RQ2: *How do individual job characteristics and personal attitudes influence employees' behavior towards automation and digitalization?*

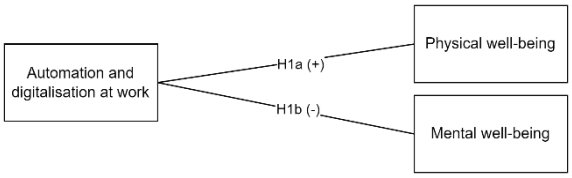
Based on the previous literature and research described in Section 1, we are primarily interested in the links and relationships between the company's automation and digitalization efforts and workers' well-being (Hackman & Oldham, 1975). Starting from the assumption that automation in a factory, e.g., through robots or automated guided vehicles (AGVs), reduces the physical strain of workers, we hypothesize that

- H1a: *The company's automation and digitalization efforts are positively correlated with workers' physical well-being.*

Conversely, given employees' latent fear of being replaced by robots or AI, we expect a negative relationship between automation and digitalization and employees' psychological well-being.

- H1b: *The company's automation and digitalization efforts are negatively correlated with employees' psychological well-being.*

The relationship between the two above-mentioned Hypotheses 1a and 1b, automation and digitalization, and well-being is shown in Figure 1.



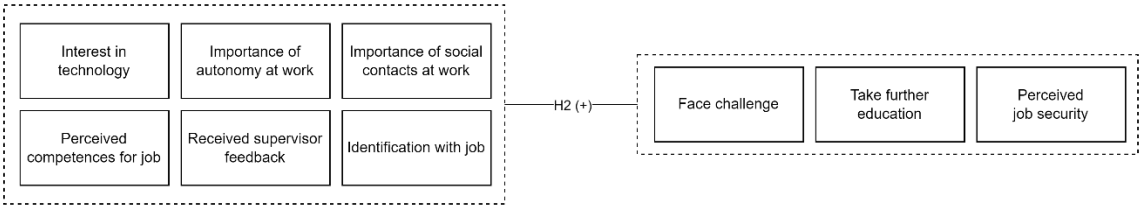
Source: Own

Fig. 1: *Conceptual model of Hypotheses 1a and 1b*

Second, we are interested in the relationships between workers' job characteristics and attitudes towards their work (Deci & Ryan, 2014; Hackman & Oldham, 1975; Neyer et al., 2012) and their prospective behavior in the face of further digital transformation. This forms our Hypothesis 2:

- H2: *Workers' autonomy, competence, feedback interested, social embeddedness, and identification, and interest in new technologies are positively correlated with their willingness to face upcoming challenges, participation in training, and perceived job security.*

Correlation of Hypothesis 2 is shown in Figure 2.



Source: Own

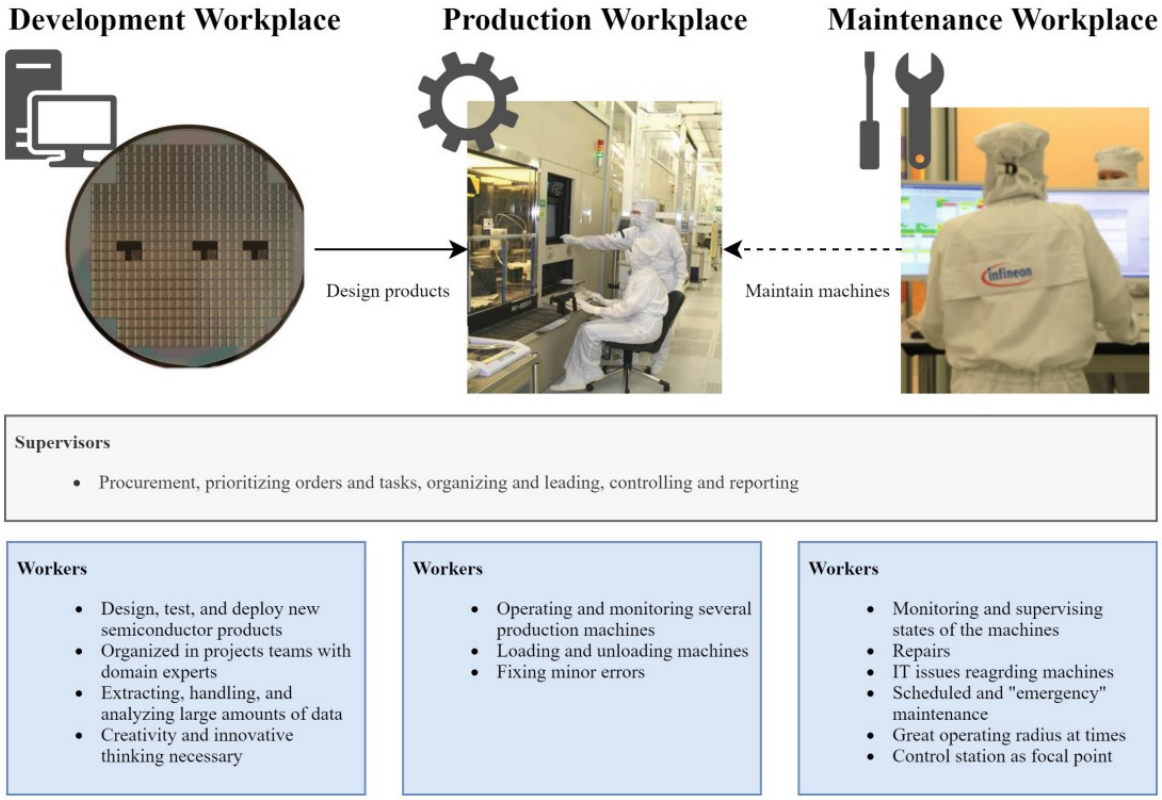
Fig. 2: *Conceptual model of Hypothesis 2*

3 Methods

For confirmatory hypothesis testing, we conducted a correlational study based on secondary data from a survey described in detail below. Using a convenience sample from the European research and development project Integrated Development 4.0 (iDev40) in the semiconductor industry, a standardized paper questionnaire was administered to skilled workers from two departments of Infineon Technologies Dresden GmbH & Co. KG in 2021: machine tool operators (Department 1) and maintenance workers responsible for the wafer transport system (Department 2). All shift supervisors in the two departments were approached and asked to distribute the questionnaire to their colleagues on a voluntary basis, while maintaining their anonymity. In the end, two shift supervisors forwarded the questionnaire to their colleagues (one each from Department 1 and 2), resulting in a response rate of almost 100%. From these shifts, only workers on holiday or sick leave could not be reached.

Both jobs at Infineon Dresden are already characterized by a high level of automation and digitalization (Schneider et al., 2022) and therefore highly suitable for our research to assess their impact on the workers. The operators at Infineon Dresden are rarely needed to load and unload equipment and almost never to transport wafer batches, as is shown in Figure 3. These processes have been automated through wafer handling robots and AGVs under the ceiling. They are responsible for operating and monitoring the equipment in terms of tool processes and recipes from their computer station, relying on sensor data and using the Manufacturing Execution System (MES), and initiating minor countermeasures if necessary.

The maintenance staff of the wafer transport system monitor the status of the transport system from a control room with several displays and carry out scheduled and unscheduled maintenance (Keil et al., 2020). For these tasks, they use sophisticated, digital transport system monitoring software and mobile applications to track issues and coordinate their tasks and actions throughout the plant in real time. Just the mechanical task itself remains manual (Schneider et al., 2022).



Source: Infineon Dresden (Keil et al., 2020)

Fig. 3: *Generic production and production-support workplaces at highly automated and digitalized semiconductor manufacturers*

3.1 Measures

The questionnaire items used for the measures and their codes are reported in Table 1.

The *level of Automation and Digitalization* in the workplace was measured by two questions, one on the current level of automation and digitalization and the other on the company's future efforts in this area. The answers to each question were coded as "0" ("neither"), "1" ("either automation or digitalization"), "2" ("both"). The mean of both items was then used as a measure of the perceived overall level of automation and digitalization in the company.

Both *Physical and Mental Well-being* was also measured with two items asking how often workers currently feel physically or mentally tired and how they expect this to change with increased automation and digitalization, respectively, on response scales of "1" to "4" ("negatively" to "positively"). The responses were then inversely recoded to fit the concept of "well-being" instead of "exhaustion," and the mean of each was used for the analysis.

Autonomy, Social Contacts, Job Competence, Feedback and Job Identification were measured in an analogous way with two items and the same response scales, but without recoding.

The same scales were used for Interest in *New Technologies, Willingness to Face New Challenges, Participation in Training, and Perceived Job Security*, but with only one item each.

3.2 Analysis

For the analysis, we used version 2.3 of The jamovi Project (2022) and version 4.1 of R from R Core Team (2021). As we calculated the averages of the respective variable items in question shown in Table 1, we used the Pearson correlation coefficient for metric values to

test the bivariate relationships in H1 and H2. We used an alpha level of 0.05 as the threshold for rejecting each null hypothesis. Where appropriate, we also adjusted the respective alpha level by using the Holm-Bonferroni method (Holm, 1979) to account for the respective family-wise error rates (FWER) of multiple hypothesis testing in H1a and H1b and H2.

Tab. 1: *Survey items (translated from German)*

Variable	Item	Code	Meaning
Automation / digitalization	Have your work processes been already automated (e.g. use of robots, automated guided vehicles, …) or digitalized (e.g. use of tablets, VR glasses, …)?	0	neither
		1	either automation or digitalization
		2	both
	Your work processes are not automated or digitalized but they are already planned to be changed in such a way.	0	neither
		1	either automation or digitalization
		2	both
Physical well-being	Do you often feel physically exhausted and tired because of your current work? *Requires inverse recoding.*	1	very rarely
		2	rarely
		3	frequently
		4	very frequently
	In your opinion, how would a planned automation and/or digitalization of work processes impact your physical condition mentioned in the previous question?	1	very negatively
		2	negatively
		3	positively
		4	very positively
Mental well-being	Do you often feel mentally exhausted and tired because of your current work? *Requires inverse recoding.*	1	very rarely
		2	rarely
		3	frequently
		4	very frequently
	In your opinion, how would a planned automation and/or digitalization of work processes impact your mental condition mentioned in the previous question?	1	very negatively
		2	negatively
		3	positively
		4	very positively
Autonomy	How important is it for you to be able to work independently?	1	very unimportant
		2	unimportant
		3	important
		4	very important
	How do you think your level of independence has changed or will change because of automation and/or digitalization?	1	very negatively
		2	negatively
		3	positively
		4	very positively
Social contacts	How important is personal contact with other colleagues for the fulfilment of your work tasks?	1	very unimportant
		2	unimportant
		3	important
		4	very important
	How do you think the importance of personal contact has changed or will change because of automation and/or digitalization?	1	very negatively
		2	negatively
		3	positively
		4	very positively

Variable	Item	Code	Meaning
Job competence	Do you think you have all the necessary competencies (skills and knowledge) to work successfully in an automated and/or digitalized workplace?	1	no
		2	rather no
		3	rather yes
		4	yes
Feedback	Do you receive enough feedback from your supervisor (frequency/content) on your work?	1	not sufficient
		2	rather not sufficient
		3	rather sufficient
		4	sufficient
	How do you think the level of feedback from supervisors has changed or will change because of automation and/or digitalization?	1	very negatively
		2	negatively
		3	positively
		4	very positively
Job identification	How much do you identify with your job?	1	very weakly
		2	weakly
		3	strongly
		4	very strongly
	How do you think the identification with your job has changed or would change because of automation and/or digitalization?	1	very negatively
		2	negatively
		3	positively
		4	very positively
Interest in new technologies	I am always interested in using the latest technical equipment.	1	not true at all
		2	rather not true
		3	rather true
		4	completely true
Willingness to face new challenges	Imagine that your company plans to implement automated and digitalised systems and processes. How likely is it that you would be up to the new challenge from a professional perspective?	1	very unlikely
		2	rather unlikely
		3	rather likely
		4	very likely
Participation in training	How likely would you be to take advantage of training opportunities offered by the company to this regard?	1	very unlikely
		2	rather unlikely
		3	rather likely
		4	very likely
Perceived job security	How secure do you think your job is regarding increasing automation and/or digitalization?	1	very insecure
		2	rather insecure
		3	rather secure
		4	very secure

Source: Own

4 Results

4.1 Descriptive Statistics

46 participants completed the questionnaire, 42 from Department 1, and 4 from Department 2. 30 of the participants identified themselves as male, 16 as female. 11% were 34 years old or younger, 46% were 35–49 years old, and 44% were 50 years old or older. Overall, the respondents perceived their workplaces to be slightly above average in terms of automation and/or digitalization.

The sample statistics in Table 2 shows that, except for *Physical* and *Mental well-being*, all individual variables were reported to be above average. The highest average scores were given to employees' *Willingness to face new challenges* due to digitalization and to *Participate in further training*. Perceived *Autonomy*, *Competences*, *Job identification* and *Feedback* also received high mean scores ranging from 3.03 to 3.14. However, *Social contacts*, *Interest in new technologies*, and *Job security* were reported to be the lowest. In particular, the *Interest in new technologies*, *Job security* and *Competences* show the greatest variation in terms of their standard deviation.

Tab. 2: *Sample statistics*

Variable	*N*	Mean	Standard deviation
New challenges	46	3.46	0.59
Further education	46	3.33	0.52
Autonomy	45	3.14	0.41
Competence	46	3.13	0.69
Identification	38	3.07	0.35
Feedback	38	3.03	0.55
Social contacts	43	2.94	0.48
New technologies	46	2.93	0.74
Job security	46	2.89	0.71
Mental well-being	43	2.35	0.46
Physical well-being	42	2.24	0.51
Automation / digitalization	26	1.19	0.60

All variables have score from 1 to 4 with the exception of *Automation / digitalization* which has score from 0 to 2, see Table 1.

Source: Own

Overall, the variables related to *New challenges* and *Further education* are rated highest, while *Job security*, along with *Physical* and *Mental well-being*, receive lower scores. This suggests a greater perceived importance of career development opportunities than respondents' perceived *Job security* and *Well-being*.

4.2 H1: Automation, Digitalization, and Well-being

The results of the one-tailed Pearson correlation tests between automation and digitalization and both *Physical* (alternative hypothesis is positive, $r = 0.19$, $p > 0.05$, $N = 26$) and *Mental well-being* (alternative hypothesis is negative, $r = 0.09$, $p > 0.05$, $N = 26$) show no statistically significant correlation.

We, therefore, reject both H1a and H1b. We conclude that there is either no or a negative relationship between the level of automation and digitalization and *Physical well-being*. Similarly, there is either no or a positive relationship between automation and digitalization and *Mental well-being*.

These results contradict our previous assumptions. This may indicate that it is not possible to draw a direct link between the perceived automation and digitalization efforts of the company and the perceived well-being of the workers. Rather, it may be that their well-being is related to one or more other human factors and ergonomic aspects, such as those investigated in H2.

4.3 H2: Job Characteristics, Attitudes, and Behavior

Given the number of relationships tested (n = 18), the adjusted alpha levels using the Holm-Bonferroni correction method (Holm, 1979) allow us to reject the null hypotheses only for the correlations between *Job identification* and *Willingness to face new challenges* (alternative hypothesis is positive, r = 0.50, p < 0.0028, N = 38) and *Interest in new technologies* and *Continuing education* (alternative hypothesis is positive, r = 0.46, p < 0.0029, N = 46). Although several other associations also show statistical significance for themselves, it cannot be ruled out that these associations are not due to chance.

Table 3 presents Pearson's correlation coefficients between the various variables and three main factors: *New challenges*, *Further education*, and *Job security*. The correlations are one-sided, assuming a positive relationship. Significant results, as determined by the Holm-Bonferroni correction for multiple hypothesis testing, are highlighted in **bold**.

Tab. 3: *Correlation matrix of Hypothesis 2*

Variables	*N*	*New challenges*	*Further education*	*Job security*
Autonomy	45	0.06	0.09	–0.01
Competence	46	0.35 **	0.25 *	0.31 *
Feedback	38	0.21	0.15	0.11
Social contacts	43	0.18	–0.01	0.08
Job identification	38	**0.50** ***	0.24	0.40 **
Interest in new technologies	46	0.38 **	**0.46** ***	0.03

Note: * p < .05, ** p < .01, *** p < .001
Source: Own

Job identification (N = 38) demonstrates significant medium correlations with *New challenges* (r = 0.50, p < 0.001) and *Job security* (r = 0.40, p < 0.01). The correlation with *Further education* is small but non-significant (r = 0.24).

Interest in new technologies (N = 46) shows significant medium correlations with *Further education* (r = 0.46, p < .001) and *New challenges* (r = 0.38, p < 0.01). The correlation with *Job security* is weak and non-significant (r = 0.03).

Competence (N = 46) exhibits significant medium correlations with *New challenges* (r = 0.35, p < 0.01) and *Job security* (r = 0.31, p < .05). Also, the correlation with *Further education* is significant but weak (r = 0.25, p < 0.05).

Feedback (N = 38) has weak, non-significant correlations with *New challenges* (r = 0.21), *Further education* (r = 0.15), and *Job security* (r = 0.11).

Social contacts (N = 43) shows also weak and non-significant correlations with *New challenges* (r = 0.18), *Further education* (r = -0.01), and *Job security* (r = 0.08).

Autonomy (N = 45) shows weak and non-significant correlations with all three factors: *New challenges* (r = 0.06), *Further education* (r = 0.09), and *Job security* (r = -0.01).

Overall, the variables *Competence*, *Job identification*, and *Interest in new technologies* show the most significant positive correlations with the factors of *New challenges*, *Further education*, and *Job security*, suggesting that these aspects are strongly interrelated. *Autonomy*, *Feedback*, and *Social contacts*, however, do not show significant correlations with these factors.

5 Discussion

The results show that contrary to our initial hypotheses, workers' physical and mental well-being is not directly related to the level of automation and/or digitalization within the company (H1a and H1b). A plausible explanation could be that the semiconductor production environment has been subject to automation and digitalization efforts ever since, and workers may be used to such changes or at least less susceptible to strain.

Furthermore, we only see relationships between employees' identification with their job and their willingness to face new digitalization challenges, as well as between their interest in new technologies and participation in training (H2). This shows that identification with and interest in new technologies may be key personal characteristics of employees that are necessary to drive automation and digitalization efforts in organizations successfully.

It also means, that we could not find support in our sample and with our methods for well-known concepts of work design such as autonomy, competence, and relatedness (Deci & Ryan, 2014; Hackman & Oldham, 1975), which raises the question of other influencing factors for the observed behavior.

Nevertheless, although not statistically significant, there are also indications that the perception of appropriate skills for digitalization may be positively correlated with the willingness of employees to face new challenges and to participate in further training (Tab. 2). Conversely, this would imply that employees who perceive their digital literacy as low are also less likely to participate in relevant training, which seems counterintuitive. Less surprisingly, perceived competence is also likely to be correlated with perceived job security.

The fact that the willingness to take on new professional challenges and to participate in training are rated the highest overall (Tab. 1), and that perceived job security and well-being are rated lowest, suggests that job security and well-being may be closely linked, and that the skilled workers may have understood that continuous personal development and lifelong learning are necessary improve their situation.

5.1 Limitations

Although our study provides valuable insights and starting points for further research, it also has several limitations, which we highlight below.

First, although the questionnaire and its items are based on well-known constructs from SDT and JDS introduced in Section 1.2, they have only been used in this study so far, which poses a threat to the internal validity of the measurement method and requires further testing. Furthermore, in order to reach skilled workers in the semiconductor industry at all, we had to rely on the role of gatekeepers in the form of the shift supervisors. This means that the supervisor's decision to forward the questionnaire may have been based on an expectation of good results from their employees, thus biasing our data. Furthermore, as the survey was administered by the supervisors themselves, we cannot completely rule out the possibility that the employees answered the questions in an unbiased manner and did not fall prey to socially desirable answers. Finally, due to the characteristics of the sample (only employees of one company), the external validity and generalizability of the results is also limited and must be used with caution.

5.2 Future Research

Based on the findings and the limitations of our study, several areas for further research can be identified. While we have studied a semiconductor company with a high level of automation and digitalization, we call for a comparison of the results with other industries,

jobs, and different companies with different levels of automation and digitalization, especially at lower levels. In doing so, we hope to gain further insights into whether our conclusions apply to workers in other contexts, or how they should be modified.

Such research can be both qualitative and quantitative, through interviews or observations of workers, or through further survey studies or natural experiments comparing different groups of workers with different individual and organizational characteristics.

Furthermore, the questionnaire needs to be optimized and further validated to improve its internal validity. This should be done by further testing in the field and comparison or inclusion and adaptation of other already validated questionnaires such as the TAM or Technology Commitment (Neyer et al., 2012) in order to obtain a standardized measurement method.

Conclusion

We conducted a case study focusing on semiconductor industry employees, using a standardized paper questionnaire to assess 46 employees' personal attitudes towards automation and digitalization and their job characteristics. To gain insights into the relationships between job characteristics, well-being, and digitalization, we adapted constructs from both SDT and JDS explained in Section 1.2.

Contrary to previous assumptions, employees' mental and physical well-being is not related to the level of automation or digitalization in the company. Similarly, autonomy, feedback, and social contacts at work are not correlated with employees' prospective behavior in relation to workplace digitalization, such as personal effort or participation in training.

However, job identification and interest in new technologies are positively correlated with such prospective digital behavior. Most interestingly, however, the lower the perceived digital competence of employees, the lower their willingness to participate in digital training.

Consequently, these findings lead to several implications for managers. First, in their efforts to promote digitalization, companies should focus on job seekers with high levels of job identification, interest in new technologies, commitment to lifelong learning and/or openness to change. However, while the labor market is difficult for companies, they would secondly need to foster these attitudes in their current employees to successfully manage the digital transformation between the organization and its employees with as little friction as possible. However, this effort is no less challenging.

In addition to the managerial implications mentioned above, we have also contributed to the literature on digital work design. As we could not find any correlations between the constructs of SDT or JDS (Section 1.2) in the light of digitalization, except for job identification, we suggest that these constructs should be considered and tested, e.g. as interaction effects, in more complex empirical studies. Such studies could also take the form of natural experiments, comparing the attitudes of employees in highly digitalized companies (as in our study) with those in less digitalized companies.

Further research is needed to capture the multifaceted nature of employee well-being, especially in the digital age.

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POSTOJE PRACOVNÍKŮ K DIGITÁLNÍ TRANSFORMACI A VNÍMANÁ PRACOVNÍ POHODA: PŘÍPADOVÁ STUDIE

Tato studie zkoumá postoje pracovníků k digitální transformaci a pracovní pohodě v polovodičovém průmyslu se zaměřením na významného německého výrobce s cílem identifikovat ergonomické a manažerské potenciály pro zlepšení. Prostřednictvím standardizovaného papírového průzkumu 46 mezi kvalifikovanými pracovníky v roce 2021 zkoumá dopad automatizace a digitalizace na pracovní pohodu a vliv pracovních charakteristik a postojů na chování pracovníků. Pro potvrzující testování hypotéz byl mezi proměnnými vypočten Pearsonův korelační koeficient. Výsledky neukazují žádnou přímou souvislost mezi digitalizačním úsilím společnosti a pohodou pracovníků. Identifikace pracovníků s jejich prací a zájem o nové technologie však pozitivně korelují s ochotou přijímat digitální výzvy a účastnit se dalšího vzdělávání. Tato zjištění naznačují, že podpora sebeidentifikace s prací a zájem o technologie může zvýšit zapojení do digitálních iniciativ, což nabízí organizační poznatky pro řízení digitální transformace podniků.

DIE EINSTELLUNG VON ARBEITNEHMERN ZUR DIGITALEN TRANSFORMATION UND DAS WAHRGENOMMENE WOHLBEFINDEN AM ARBEITSPLATZ: EINE FALLSTUDIE

Diese Studie untersucht die Einstellung von Arbeitnehmern zur digitalen Transformation und das Wohlbefinden am Arbeitsplatz in der Halbleiterindustrie, um arbeits- und managementwissenschaftliche Verbesserungspotentiale zu identifizieren. Anhand einer standardisierten Befragung von 46 Facharbeitern im Jahr 2021 werden die Auswirkungen von Automatisierung und Digitalisierung auf das Wohlbefinden sowie der Einfluss von Arbeitsplatzmerkmalen und persönlichen Einstellungen auf das Verhalten der Arbeitnehmer untersucht. Zur Bestätigung der Hypothesen wurde der Korrelationskoeffizient nach Pearson zwischen den Variablen berechnet. Die Ergebnisse zeigen keinen direkten Zusammenhang zwischen den Digitalisierungsbemühungen des Unternehmens und dem Wohlbefinden der Arbeitnehmer. Allerdings korrelieren die Identifikation der Arbeitnehmer mit ihrem Arbeitsplatz und ihr Interesse an neuen Technologien positiv mit ihrer Bereitschaft, sich digitalen Herausforderungen zu stellen und an Weiterbildungsmaßnahmen teilzunehmen. Diese Ergebnisse deuten darauf hin, dass die Förderung der Identifikation mit dem Arbeitsplatz und des Interesses an neuen Technologien das Engagement für digitale Initiativen erhöhen kann und somit Erkenntnisse für das Management bei der Bewältigung des digitalen Wandels bietet.

STOSUNEK PRACOWNIKÓW DO TRANSFORMACJI CYFROWEJ A ODCZUWANY KOMFORT PRACY: STUDIUM PRZYPADKU

Przedmiotem niniejszego badania jest analiza nastawienia pracowników do transformacji cyfrowej i komfortu pracy w branży półprzewodników, ze szczególnym uwzględnieniem wiodącego producenta w tym sektorze w Niemczech, w celu zidentyfikowania ergonomicznych i menedżerskich możliwości poprawy. Poprzez standardową ankietę papierową przeprowadzoną wśród 46 wykwalifikowanych pracowników w 2021 r., zbadano wpływ automatyzacji i cyfryzacji na dobre samopoczucie oraz wpływ cech pracy i postaw na zachowanie pracowników. W celu potwierdzenia hipotez obliczono współczynnik korelacji Pearsona między zmiennymi. Otrzymane wyniki nie wykazują bezpośredniego związku między wysiłkami podejmowanymi przez firmę w zakresie cyfryzacji a dobrostanem pracowników. Jednakże poziom identyfikacji pracowników z ich pracą oraz ich zainteresowanie nowymi technologiami są pozytywnie skorelowane z chęcią podejmowania przez nich wyzwań związanych z cyfryzacją i udziału w dalszym kształceniu. Wyniki te sugerują, że promowanie identyfikacji z pracą i zainteresowania technologią może zwiększyć zaangażowanie w inicjatywy związane z cyfryzacją, oferując wgląd organizacyjny w nawigację po procesie transformacji cyfrowej.