

# Human Resource Sustainability and Digital Transformation: Exploring the Role of Key Actors

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## Abstract

Digital transformation changes economy and society, makes significant changes in people's life and can have both positive and negative consequences for individuals, organisations and society. To the success of digital transformation, the human factor is more important than the technology itself. This research survey focuses on the human perception of support needed from different actors for their adaptation towards digital transformation. The quantitative research in the form of a questionnaire survey was carried out using an online panel. The respondents for the questionnaire survey were adult people living in the Czech Republic ( $n = 1000$  from generations Baby Boomers, X and Y). The questionnaire design was inspired by the OECD Risks That Matter Survey 2020. The research focuses on what role different actors play in addressing negative impacts of digital transformation. The findings show that the highest level of responsibility was given to the Czech government, followed by firms and public administration. Conversely, lower levels of accountability were attributed to nonprofit organisations and trade unions, but surprisingly also at the individual level. The findings further found no significant effect on the perception of responsibility of government, firms and public administration, nonprofit organisations and trade unions for gender, education, nature of work and type of generation. However, we identified differences among groups in their assessment of responsibility on an individual level. Findings are important for decision-makers that should be responsible for peoples' transformation in the context of digital transformation.

## Key Words

*digital transformation, human resources, generations, individual's perception*

**JEL Classification: M39, M53, M54**

## Introduction

Digital transformation (DT) has a significant impact on all aspects of our lives, including the manner of doing business, working and living (Švarc et al., 2021). It also represents a challenge for individual companies, institutions and national and global economies as a whole (Kraus et al., 2022). Digital transformation refers to a broader process of transforming an organisation on different levels (e.g., strategy, governance, leadership, culture, people, technology, etc.) by making use of digital technologies and concepts (Heilig et al., 2017). It is also important to note that digital transformation does not solely concern technologies and strategies but also people and their mindset to accept digital changes (Tabrizi et al., 2019). Digital transformation has been becoming increasingly important in the field of corporate sustainability and has brought many benefits to businesses and society (Chen & Hao, 2022). The increase in digital transformation may in many areas accelerate economic performance, significantly improve the production

and innovation efficiency of enterprises, reduce costs, increase revenue, enhance customer engagement and customer service and, in the end, lead to substantial improvements in the companies (Li et al., 2023).

Notwithstanding the positive impacts of digital transformation, some negative consequences for individuals, organisations, and society have occurred (Aly, 2020). In this context, increasing attention is given to the human impact of digital transformation. Some authors argue that digital transformation can lead to job displacement or the replacement of some occupations, contribute to social and economic inequality including wage inequality, and increase job polarisation and skills instability (Kristal, 2020, Frey & Osborne, 2017). Similar to any other change, digital transformation induces uncertainty among individuals. The uncertainty and fear in the context of digital transformation, associated with changes concerning potential job loss and the changes in the nature of work, are a burden on individuals (cf. Boswell et al., 2014). However, individuals are not only affected by digital transformation but can actively shape it (Blanka et al., 2022). Thus, it is important to understand people's perceptions and attitudes toward digital transformation in the workplace. An important role in how individuals view and engage with digital technologies is played by generational cohorts (Calvo-Porrall et al., 2019). Each generational cohort shares similar values, beliefs, and attitudes and holds specific characteristics that distinguishes one generational cohort from the other (Brink & Zonda, 2021). Thus, the generational cohort approach enables us to understand attitudes and motivations of different generations towards digital transformation in the workplace.

A sustainable approach to human resource management (HRM) has the potential to overcome some of the negative consequences of digitalization in the workplace (Aust et al., 2020). Sustainable HRM refers to social, human and environmental outcomes that contribute to a sustainable organisation. Furthermore, sustainable HRM stressing the leading role of HRM in digital transformation can provide more flexibility to the organisation and its workforce in this process (Kramar, 2022). In addition, sustainable HRM together with digital transformation can help to create sustainable organisations.

It is evident that the impact of DT occurs not only at the business level, it also has environmental, societal, and institutional implications (Kraus et al., 2021). In addition, DT represents a process that involves several ongoing initiatives and different interconnected actors such as government, local institutions, companies, management and individuals. In this process none of the actors can be seen in isolation. Instead, all of them need to actively interact, collaborate with each other, accelerate DT and create sustainable societies (Pappas et al., 2018).

This research survey focuses on the human perception of support needed from different actors for their adaptation towards digital transformation. Thus, the research raises the following research question: How do individuals perceive the role that different actors play in addressing negative impacts of DT, including their own active involvement? In light of the research question, the following research hypotheses were developed:

H1: Individual's perception of different actors' responsibility in addressing the potential negative side effects of digital transformation is influenced by the type of generation.

H2: There is no difference between men and women concerning perception of different actors' responsibility in addressing potential negative side effects of DT.

H3: Individual's perception of different actors' responsibility in addressing potential negative side effects of DT is influenced by the level of education.

H4: Individual's perception of different actors' responsibility in addressing potential negative side effects of DT is influenced by the nature of their work (predominance of physical or mental work).

## 1. Methods

The quantitative research in the form of a questionnaire survey was carried out at the end of the year 2021. The primary data were collected using an online panel. Talk Online Panels operate in Central and South Eastern Europe through a network of representative offices (DATACOLLECT, 2022). Detailed tracking across selected demographic attributes allows for respondents to be selected according to the required sample selection characters (gender, age, location in CZ). The data were collected by both computer-assisted web interviewing and computer-assisted telephone interviewing.

### 1.1 Sample

The respondents for the questionnaire survey were adult people (aged 18+) living in the Czech Republic. The research sample size was set at 1,000 respondents, which is the usual size for surveys within the Czech population for this type of research (cf. CVVM, 2021). The distribution of respondents in the quota sampling (cf. Burs et al., 2017) is according to the basic demographic characteristics of the population, such as gender and age (see Table 1), but also the region. Therefore, the sample could be considered representative of the Czech Internet population. In addition, in 2022 the Internet penetration in the Czech Republic was 87% (Internet World Stats, 2023).

### 1.2 Instrument

The questionnaire design was inspired by the OECD Risks That Matter Survey 2020, specifically by the section Digitalization, technology, and the changing world of work and by the items focused on finding out respondents' views on the roles of different actors in addressing potential negative side effects of technological change in the context of DT. For the purpose of our survey, we modified these items in order to use them in the Czech context. In modified items, we used the following actors – the European Union, the Czech government, public administration, firms, trade unions, nonprofit organisations (NGOs) and individual workers. For each questionnaire item, a 5-point Likert scale was used for responses, ranging from 1 = strongly disagree to 5 = strongly agree. In the final part of the questionnaire, supporting information for further statistical analysis was collected from the respondents' demographic information (for our purpose in particular age = division into generations, gender, educational attainment, nature of work = predominance of physical or mental work).

### 1.3 Statistical Methods

First, the obtained data were evaluated using descriptive statistics, namely sample means and frequencies. The data was used to determine the ranking of actors according to respondents' comments on the importance of their role in supporting people in the context of digital transformation. Second, formal statistical methods were used to verify the H 1-4 hypotheses. The samples are independent of each other, data have normal distributions and the number of participants is high. Thus, the effect of gender, generation, education and nature of work on the level of need for support from different subjects was

assessed using a two-sample t-test and an one-way ANOVA. Statistical analysis was performed in the statistical software TIBCO (Statistica).

## 2. Results

The research sample size of 1,000 was obtained using quota sampling. Quotas by gender and generation are presented in Table 1.

**Tab. 1: Quota sampling**

Gender / Generation	B	X	Y	Total
Male	85	285	130	500
Female	85	285	130	500
Total	170	570	260	1000

*Source: own*

Table 1 shows that the distribution of males and females in the sample of respondents is 50/50. Table 2 documents the distribution of the respondent population by education and by nature of work (predominance of physical or mental work).

**Tab. 2: Overview of control variables**

Variable	Number	Percentage
Education Level		
Primary	22	2.2
Secondary	611	61.1
Tertiary	367	36.7
Work Type		
Mental	699	69.9
Physical	301	30.1

*Source: own*

In Table 3 below we see the distribution of responses to the questionnaire items by generations. Respondents expressed the degree of responsibility of the selected entity for possible negative side effects of technological change in the context of digital transformation on humans.

**Tab. 3: Distribution of responses by generations**

Items		Gen BB		Gen X		Gen Y	
		Means	SD	Means	SD	Means	SD
EU	Q3_1	3.49	1.13	3.66	1.03	3.65	1.00
Czech government	Q3_2	3.95	0.90	3.84	0.95	3.77	0.99
Public administration	Q3_3	3.79	0.85	3.80	0.85	3.67	0.92
Firms	Q3_4	3.79	0.71	3.81	0.77	3.73	0.82
Trade unions	Q3_5	3.55	0.87	3.63	0.85	3.60	0.84
NGOs	Q3_6	3.01	1.03	3.06	1.03	3.07	0.91
Involvement of individuals	Q3_7	3.38	0.93	3.59	0.86	3.60	0.91

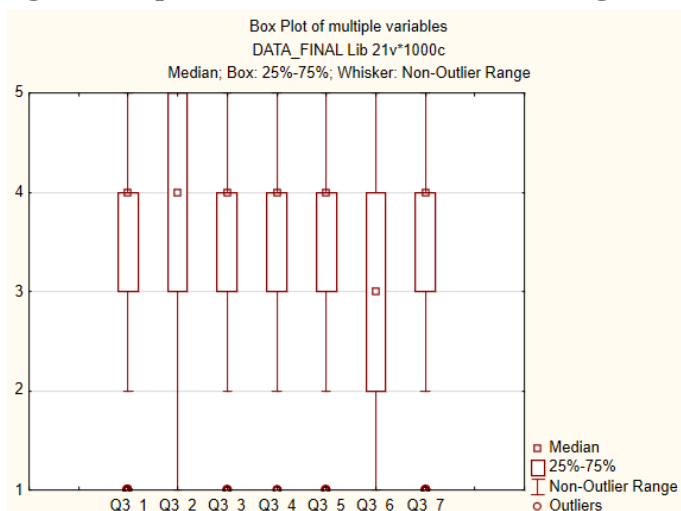
*Source: own*

Note: 1 = strongly disagree to 5 = strongly agree.

The highest level of responsibility was given to the Czech government, followed by firms and public administration. Conversely, lower levels of accountability were expressed for

NGOs and trade unions, but surprisingly also at the individual level. The basic graphical presentation of descriptive data is shown in Figure 1 below.

**Fig. 1: Box plots, data distribution for all generations**



Source: own

Figure 1 offers general information about a group of data symmetry, skew, variance and outliers. The box plots show the distribution of numeric data values of the research sample in all items. The results (Table 3) show that differences are only in item Q3\_7, and for all groups assessed. This means that hypotheses H1 - H4 will be further evaluated only in this item of the questionnaire.

Thus, the two-sample t-test and a one-way ANOVA were used to determine statistically significant differences in responses according to the classification criteria.

Statistically significant differences were found in Q3\_7 item, involvement of individuals in terms of generation type. A one-way ANOVA revealed that the effect of generations was significant between at least two groups ( $F(2, 1) = [3.91]$ ,  $p = 0.02$ ). H1 for Q3\_7 is supported.

**Tab. 4: Post hoc tests for statistically significant differences in involvement of individuals towards DT according type of generation.**

Generations		Sig. Q3_7
BB	X	0.023
BB	Y	0.034
X	Y	0.975

Source: own

Statistically significant differences were found in Q3\_7 item, involvement of individuals in terms of gender. There was a significant effect for gender,  $t(998) = 3.398$ ,  $p < .001$ , with men receiving higher scores than women. H2 is for item Q3\_7. Statistically significant differences were also found in Q3\_7 item, involvement of individuals in terms of education. In this case, we did not include the group of participants with only primary education in the comparison ( $n = 22$ ), and the only groups with secondary ( $n = 611$ ) and university education ( $n = 367$ ) are compared. There was a significant effect for education,  $t(976) = -4.509$ ,  $p < .001$ , respondents with higher education received higher scores than respondents with secondary level of education. H3 for Q3\_7 is supported. Statistically significant differences were found in Q3\_7 item, involvement of individuals in terms of

nature of work (predominance of physical or mental work). The participants were divided into two groups, first one = predominance of physical work ( $n = 301$ ), and second one = predominance of mental work ( $n = 699$ ). There was a significant effect for the nature of work,  $t(998) = 2.963$ ,  $p = .003$ , respondents with a predominance of mental work receiving higher scores than respondents with a predominance of physical work. H4 for Q3\_7 is supported.

### 3. Discussion

The findings indicate that respondents ascribed the greatest responsibility to the Czech government, followed by firms and public administration. On the other hand, NGOs, trade unions and surprisingly individuals themselves are perceived as less responsible for addressing the potential negative side effects of DT. This shows that respondents are unwilling to take more responsibility and that they see government, firms and public administration as dominant actors who are decision-makers in the DT. These findings have important implications for policymakers and companies in terms of how much support should be given to encourage digital transformation. As stated by Aly (2022) policymakers should emphasize the benefits of DT on the economy and the society as a whole and encourage a more positive societal attitude toward DT. On the other hand, they need to actively address and anticipate the downsides of DT and lessen the negative impact of digital transformation. Companies must proactively adapt to the new situation that DT presents (Kraus et al, 2022). It is the responsibility of management to prioritize quality policy and strategy for successful DT (Alieva & Powell, 2023).

The findings found no significant effect on the perception of responsibility of government, firms and public administration NGOs and trade unions for gender, education, nature of work and type of generation. However, we found differences among groups in their assessment of responsibility on an individual level. Significant differences emerge in each breakdown according to the groups of respondents. As expected, there was a generation difference (Calvo-Poral et al. 2019). Baby boomers are indeed different from Generations X and Y. Members of this generation expressed significantly lower willingness with their active involvement. Surprisingly, there was also a difference between men and women in this item (Q3\_7). Further, we expected persons with university education to be more active in relation to DT and to agree that they need to be actively involved themselves. This findings in fact confirmed the positive influence of higher educational attainment on the activity of individuals in the direction of lifelong learning and development. Our last criterion was the focus of work activity (predominance of physical or mental work), where again people with a predominance of mental work expressed a higher level of agreement with their active involvement in addressing the potential negative impacts of DT on their employment and life security.

### Conclusion

DT poses a substantial challenge for global and national economies, companies and individuals. It has a set of various positive and negative effects. Awareness of the negative effects of digital transformation allows us to focus on issues that lessen the negative impact of DT. Different actors should be involved in this process, including individuals who need to interact with each other in order to accelerate DT and create sustainable societies. There are some limitations that we acknowledge. The research design was

influenced by the mentioned resources. The research focused on only one country, and the respondents were not obtained by a random sample (quota sampling and the online panel were used to select respondents).

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## References

- ALIEVA, J. and POWELL, D.J. (2023). The significance of employee behaviours and soft management practices to avoid digital waste during a digital transformation, *International Journal of Lean Six Sigma*, **14**(1), (2023) 1-32. <https://doi.org/10.1108/ijlss-07-2021-0127>
- ALY, H. (2022). Digital transformation, development and productivity in developing countries: is artificial intelligence a curse or a blessing? *Review of Economics and Political Science*, **7**(4), 238-256. <https://doi.org/10.1108/reps-11-2019-0145>
- AUST, I., MATTHEWS, B., and MULLER-CAMEN, M. (2020). Common Good HRM: A paradigm shift in Sustainable HRM? *Human Resource Management Review*, **30**(3), 1–11. <https://doi.org/10.1016/j.hrmr.2019.100705>
- BLANKA, CH., KRUMAY, B., and RUECKEL, D. (2022). The interplay of digital transformation and employ competence: A design science approach. *Technological Forecasting & Social Change*. **178**, 121575. <https://doi.org/10.1016/j.techfore.2022.121575>
- BOSWELL, W. R., OLSON-BUCHANAN, J. B., and HARRIS, T. B. (2014). I cannot afford to have a life: Employee adaptation to feelings of job insecurity. *Personnel Psychology*. **67**(4), 887–915. <https://doi.org/10.2139/ssrn.2556303>
- BRINK, K.L., and ZONDA, M.M. (2021). Examining Job Attribute Preferences Across Three Generational Cohorts. *Journal of Career Development*, **48**(1) 60–72. <https://doi.org/10.1177/0894845319837384>
- BURS, A. C., VEECK A., and BUSH, R. F. (2017). *Marketing research*. Harlow: Pearson.
- CALVO-PORRAL, C., PESQUEIRA-SANCHEZ, R., and FAIÑA MEDÍN, A. (2019). A clustered-based categorization of millennials in their technology behavior, *International Journal of Human-Computer Interaction*. **35**(3), 231–239. <https://doi.org/10.1080/10447318.2018.1451429>
- CHEN, P., and HAO, Y. (2022). Digital transformation and corporate environmental performance: the moderating role of board characteristics. *Corporate Social Responsibility and Environmental Management*, **29**(5), 1757–1767. <https://doi.org/10.1002/csr.2324>
- CVVM. (2021). *How does the Public Opinion Research Centre select respondents?* [online]. [cit. 2021-12-15]. Available at: <https://cvvm.soc.cas.cz/en/cvvm2/frequently-asked-questions-menu/4847-how-does-the-public-opinion-research-centre-select-respondents>
- DATA COLLECT, 2022. CAWI – Online Interviewing. [online]. [cit. 2021-12-15]. Available at: <https://www.datacollect.cz/en/cawi-online-research/>

- FREY, C.B., and OSBORNE, M.A. (2017). The future of employment: how susceptible are jobs to computerisation? *Technological Forecasting & Social Change*, 114, 254–280. <https://doi.org/10.1016/j.techfore.2016.08.019>
- HECKLAU, F., GALEITZKE, M., & FLACHS, S. and KOHL, H. (2016). Holistic approach for human resource management in Industry 4.0, *Procedia CIRP*, **54**, 1–6. <https://doi.org/10.1016/j.procir.2016.05.102>
- HEILIG, L., LALLA-RUIZ, E., and VOß, S. (2017). Digital Transformation in Maritime Ports: Analysis and a Game Theoretic Framework. *Neteconomics: Economic Research and Electronic Networking*, **18**(2–3), 227–254. <https://doi.org/10.1007/s11066-017-9122-x>
- INTERNET WORLD STATS. (2023). Usage and population statistics. [cit. 2023-06-15]. Available at: <https://www.internetworldstats.com/stats4.htm>
- KRAMAR, R. (2022). Sustainable human resource management: Six defining characteristics. *Asia Pacific Journal of Human Resources*, **60**(1), 146–170. <https://doi.org/10.1111/1744-7941.12321>
- KRAUS, S., DURST, S, FERREIRA, J. J., VEIGA, P., KAILER, N., and WEINMANN, A. (2022). Digital transformation in business and management research: An overview of the current status quo. *International Journal of Information Management*, **63**, 102466. <https://doi.org/10.1016/j.ijinfomgt.2021.102466>
- KRISTAL,T. (2020). Why has computerization increased wage inequality? Information, occupational structural power, and wage inequality, *Work and Occupations*, **47**(4) (2020) 466–503. <https://doi.org/10.1177/0730888420941031>
- LI, S.; GAO, L., HAN, C.; GUPTA, B., ALHALABI, W., and ALMAKDI, S. (2023). Exploring the effect of digital transformation on Firms' innovation performance. *Journal of Innovation & Knowledge*, **8**(1), 100317. <https://doi.org/10.1016/j.jik.2023.100317>
- OECD (2021). OECD Risks That Matter Survey 2020 survey. [online]. [cit. 2021-10-15]. Available at: <https://www.oecd.org/social/risks-that-matter.htm>
- PAPPAS, I.O., MIKALEF, P., GIANNAKOS, M., N.,KROGSTIE, J., and LEKAKOS, (2018). Big dataand business analytics ecosystems: paving the way towards digital transformation and sustainable societies. *Information System and e-Business Management*, **16**, 479–491. <https://doi.org/10.1007/s10257-018-0377-z>
- ŠVARC, J., LAŽNĀK, J., and DABIĆ, M., (2021). The role of national intellectual capital in the digital transformation of EU countries. Another digital divide?, *Journal of Intellectual Capital*, **22**(4), 768–791.
- TABRIZI, B., LAM, E., GIRARD, K. and IRVIN, V. (2019). Digital transformation is not about technology. *Harvard Business Review*, [online]. [cit. 2021-10-15]. Available at: <https://hbr.org/2019/03/digital-transformation-is-notabout-technology>.