

“The impact of technostress on organizational functioning”

AUTHORS	Andrea Bencsik  Tímea Juhász 
ARTICLE INFO	Andrea Bencsik and Tímea Juhász (2023). The impact of technostress on organizational functioning. <i>Problems and Perspectives in Management</i> , 21(1), 230-241. doi: 10.21511/ppm.21(1).2023.20
DOI	http://dx.doi.org/10.21511/ppm.21(1).2023.20
RELEASED ON	Monday, 13 February 2023
RECEIVED ON	Thursday, 13 October 2022
ACCEPTED ON	Tuesday, 17 January 2023
LICENSE	 This work is licensed under a Creative Commons Attribution 4.0 International License
JOURNAL	"Problems and Perspectives in Management"
ISSN PRINT	1727-7051
ISSN ONLINE	1810-5467
PUBLISHER	LLC “Consulting Publishing Company “Business Perspectives”
FOUNDER	LLC “Consulting Publishing Company “Business Perspectives”



NUMBER OF REFERENCES

41



NUMBER OF FIGURES

1



NUMBER OF TABLES

6

© The author(s) 2023. This publication is an open access article.



BUSINESS PERSPECTIVES



LLC "CPC "Business Perspectives"
Hryhorii Skovoroda lane, 10,
Sumy, 40022, Ukraine
www.businessperspectives.org

Received on: 13th of October, 2022
Accepted on: 17th of January, 2023
Published on: 13th of February, 2023

© Andrea Bencsik, Tímea Juhasz, 2023

Andrea Bencsik, Ph.D., Professor,
Management Department, University
of Pannonia, Hungary.

Tímea Juhasz, Ph.D., Associate Profes-
sor, Department of Methodology for
Social Studies, Faculty of International
Management and Business FIMB,
Budapest Business School, Hungary.
(Corresponding author)



This is an Open Access article,
distributed under the terms of the
[Creative Commons Attribution 4.0
International license](https://creativecommons.org/licenses/by/4.0/), which permits
unrestricted re-use, distribution, and
reproduction in any medium, provided
the original work is properly cited.

Conflict of interest statement:
Author(s) reported no conflict of interest

Andrea Bencsik (Hungary), Tímea Juhasz (Hungary)

THE IMPACT OF TECHNOSTRESS ON ORGANIZATIONAL FUNCTIONING

Abstract

Research in recent years has shown that IT-enabled companies have higher productivity than their competitors. The new and latest technological solutions enrich the range of tools available to workers, ensuring that information is always available, communication is easier, and customers are better served. At the same time, these opportunities also create psycho-social pressures that strain workers' working and private lives and can lead to further problems of techno-addiction. The study aims to investigate the relationships between the characteristics of technostress and their combined impact on trust within the organization between human-human and human-technology relationships. The quantitative study involved 531 respondents. Responses were analyzed using IBM SPSS 28 and IBM AMOS 27. The results show that there is undoubtedly a close relationship and a mutually generating effect between technostress characteristics, which substantially impact trust within the organization. However, trust is still stronger in personal relationships than in human-technology relationships. According to the respondents, the level of preparedness, technological knowledge, and expectations influence trust in the use of technology, which also affects performance and work-life balance.

Keywords technology, stress, technostress, work-life balance, trust

JEL Classification J19, J20, J89

INTRODUCTION

According to Pompa (2013), a specter is haunting Europe – the 'Gestalt' of the virtual, invisible worker working digitally anywhere and everywhere. As a result, even more companies of 21st century Europe have entered into a holy alliance to promote this specter of time- and place-independent working, or 'New Ways of Work' (NewWoW).

Stress is a frequently cited negative phenomenon in today's organizational practice, resulting from an imbalance between the demands of a given situation and the ability to meet them (Tarafdar et al., 2015; Cooper et al., 2001). Stressful situations can manifest themselves in different forms, one of which, increasingly demanding attention, is technostress, which is a consequence of the forced use of information systems (IS). It is a complex phenomenon, the extent and significance of which are increasing in parallel with the advance of advanced information technology. ICT and AI applications raise questions about their impact on employee behavior. A number of stress factors related to IT can be identified that inhibit successful performance, impact engagement, and trust, and compromise personal fulfillment and learning, creating adverse situations in both work and private life.

Technostress has become an important area of scientific research in the last 10-15 years, and its study concerns both private and organizational situations. According to La Torre et al. (2020), technostress is the cost of using technology with a wide range of effects.

This study aims to investigate how each technostress parameter influences each other, how they affect trust between employees and toward technology in the organization, and whether they affect satisfaction and work-life balance.

1. LITERATURE REVIEW

Technostress research is still in its infancy after the issues raised in the 1980s, as the most advanced technologies are quite recent. Until recently, a smaller proportion of people were exposed to the risks associated with this topic. However, available studies on the subject suggest the existence of potential risks. If risks are ignored, they could be severe consequences down the road (Harremoës et al., 2001; EEA, 2013). Popma (2013) refers to the areas related to this topic as ‘nomadic work’ and identifies the following principal risks: technostress, techno-dependence, blurring of the boundaries between private and professional life, exhaustion, safety risks, electromagnetic fields, and ergonomic problems. Research on the negative consequences is more abundant in the literature (Brod, 1984; Kupersmith, 1992, 2003; Arnetz & Wiholm, 1997; Brillhart, 2004). This is no coincidence since the convenience of technology is experienced by all who use it, but the range of problems is less readily faced by employers and employees alike.

Jena (2015) and Salo et al. (2019), similar to Pompa (2013), revealed that technostress could cause a range of negative consequences in people’s personal (depression and concentration problems) and professional lives (reduced job satisfaction, reduced organizational commitment, and lower work performance). These negative feelings were experienced even more strongly by workers forced into the home office due to Covid-19. Moreover, the lack of direct help, reassuring support, and answers to questions was magnified by the sudden emergence of new solutions that had to be used.

Modern technologies result in almost constant connectivity, with the consequence that people constantly feel “on call” and possess more information than they can process effectively. This kind of technological complexity leads to stress. Tarafdar et al. (2007) defined technostress as one of the individual’s attempts and struggles to cope with constantly evolving technologies and the changing cognitive and social demands associat-

ed with their use. Their definition already encompasses emerging applications, constant connectivity, information overload, regular system updates, constant uncertainty, continuous relearning process, stress experienced as a result of job-related uncertainties, and technical problems associated with the organizational use of information and communication technologies (Tarafdar et al., 2010, 2015).

Thomé et al. (2007) found that technostress can cause depression and sleep problems, affecting many other aspects of life, such as personal life. Later, in 2010, three critical characteristics of the technological environment were identified:

- Managers and workers increasingly depend on information and communication technologies as they constantly upgrade software and hardware.
- Due to the increasing sophistication of ICTs, there are often significant gaps between the technological skills required and the actual knowledge of workers and managers.
- Modern ICT has changed the work environment and culture Thomee et al. (2010).

On the one hand, e-mail, electronic scheduling, and video-conferencing facilitate flexible working arrangements and teleworking. However, on the other hand, this change can lead to multi-tasking, social isolation, and increased work abstraction.

The three characteristics represent a change in thinking about how an individual interacts in the workplace. Although information and communication technologies have liberating effects that relieve workers from repetitive tasks, they also require new work styles and technological skills (Tarafdar et al., 2007). These findings were confirmed by Sareen (2019) nearly a decade later.

Tarafdar et al. (2007) identified five technostress creators. The problem of techno-complexity can

arise when a company adopts new information technology solutions and neglects supporting solutions. These solutions should always be designed according to the organizational security culture they belong to (Brivio et al., 2018).

Information overload leads to concentration disorders: information processing capabilities are not developed enough to pay sufficient attention to the ever-increasing information overload. Not paying attention means information loses its meaning or cannot be stored properly. Distraction at work causes a lack of thinking, which leads to a deterioration in the quality of the product or process (Himma, 2007). This is the problem of techno-overload. Being increasingly overwhelmed by data means losing the ability to solve and manage problems. Creativity dries up, and mistakes multiply (Hallowell, 2005). Many people lie in wait all night, waiting to hear the soft ring of their smartphone or tablet reminding them that the rest of the world is awake (iPass, 2011). This problem causes difficulties in reconciling work and private life, which is closely linked to the characteristics of working independently of time and place. This has the advantage of allowing workers to manage their working time better, but independence has drawbacks. People often work late into the evening, which takes time away from rest and family time. Sometimes this on-call availability is what employers really expect. This means they cannot get away from their work, which causes mental exhaustion, and they cannot recover. Some people may work too long in the evenings, reducing their rest periods.

On the other hand, workers feel they have to be available at all times, and sometimes they are expected to be. This means that they are never able to mentally escape from their work, which has a negative impact on their recovery. This is the phenomenon of techno-invasion, which can lead to burnout and frustration.

Techno-uncertainty is a situation where ICT users feel threatened by the possibility of losing their job or being replaced by someone with higher technological skills. Studies have shown that technostress has a negative impact on employee turnover (Tu et al., 2005). High turnover rates indicate a lack of employee engagement (Tarafdar et al., 2007, 2010, 2015), which may result from a lack of skills,

low levels of preparedness, and internal fears of employees.

In the case of techno-insecurity, workers feel insecure because of the constant change and development of technology. Related to the above characteristic, leaving the workplace is an alternative, not by choice but by necessity. In such cases, the higher level of employee preparedness may lead to internal uncertainty, mistrust, unhealthy competition, and consequently to leaving the job. In this respect, job insecurity and control are essential factors (Tams et al., 2018). If control contributes to the development of technostress, it is reasonable to assume that mutual trust may prevent this. The mutual effects and interdependencies between the constituent elements were verified through questionnaire research. The basis and initial logic of this study were provided by the statements made in the questionnaire they also tested. The summary of research objectives and results in Table 1 indicates the rise of technostress studies.

The results in Table 1 show that technostress creators harm innovation and negatively affect users' work performance, satisfaction and engagement.

The topicality of the relationship between technostress and trust issues is indicated by the fact that several researchers have addressed this topic in recent years (Tu et al., 2005; Ayyagari et al., 2011; Champion, 1988; Caro & Sethi, 1985; Salanova et al., 2013). Research has shown the need for value and trust-based management and managerial thinking to facilitate knowledge transfer within the firm. Previous research supports that organizations do not truly value trust as a profit-generating factor (Bencsik et al., 2020). A review of the demands on today's workforce shows that communication, digital technology skills, continuous learning, problem-solving, multidisciplinary knowledge, and innovative thinking have come to the fore (Némethy & Poór, 2018; Tarafdar et al., 2020).

IT awareness can mitigate the consequences of technostress in the workplace directly and indirectly, i.e., by increasing job satisfaction (Ioannou & Papazafeiropoulou, 2017). Trust (Swanson & Ramiller, 2004), a dominant feature of organizational culture, plays a crucial role in the understanding, implementation, adoption, and assim-

Table 1. Research findings on technostress

Source: Own elaboration.

Sources	Research results	Sample
Tarafdar et al. (2010, 2015)	<ul style="list-style-type: none"> Harmful effects of technostress: reduced innovation and productivity, ICT and end-user satisfaction; Technostress can be reduced: user involvement, innovation support mechanisms, and communication support environment. 	A mid-western region in the USA two organizations of public sectors (233 respondents)
Jena (2015)	<ul style="list-style-type: none"> Adverse effects of technostress: negatively impacting job satisfaction and organizational commitment, performance supported by technology; Technostress inhibitors: reduce the components of technostress and positively affect job satisfaction, organizational commitment, and technology-enhanced performance. 	Academics of Indian universities and colleges (216 respondents)
Saunders et al. (2017)	There is no link between age and ICT overload.	Social media (e-mails, personal interviews) (1004 respondents)
Al-Ansari and Aalshare (2019)	<ul style="list-style-type: none"> Technostress creators negatively affect job satisfaction; Technostress inhibitors positively affect job satisfaction. 	Random sample (401 respondents)
Pirkkalainen et al. (2019)	<ul style="list-style-type: none"> The creators of technostress negatively affect IT-supported productivity; Separation from IT increases IT-based productivity. 	Full-time employees in informatics (846 respondents)
Maier et al. (2019)	<ul style="list-style-type: none"> Individual neurosis increases the effect of technostress, which increases the chance of burnout; Technostress can be reduced by personal innovation in IT, IT awareness, and user participation. 	Sample 1 German employees Sample 2 persons from the USA (408 respondents)
La Torre et al. (2020)	<p>There is a significant relationship:</p> <ul style="list-style-type: none"> techno-overload and gender, age group, and work activity; techno-invasion and gender, educational attainment; techno-complexity and age, marital status, year of employment. <p>In terms of techno-uncertainty, there was no significant association with these factors.</p>	Respondents between 16-65 age (313 respondents)

ilation of technological developments. If trust is strong, members of the organization can respond positively to increases in technological burden, easing the burden through mutual knowledge transfer. If trust does not exist, the reaction is the opposite, with the fear of knowledge and the assertion of individual interests coming to the fore. The constantly challenging burden of technology can be reduced through the mutually supportive behavior of staff by promoting knowledge sharing, which is dysfunctional without a climate of trust.

When looking at the listed characteristics of technostress from the aspect of trust, it is essential to clarify whether trust can be directed toward technology on the part of the employees or, in business organizations, it refers to trust between the organization and the individual or between two individuals. Emotional intelligence can alleviate stress and enhance trust among software developers working on information system projects (Rezvani & Khosravi, 2019).

Trust is an exceptional phenomenon and value in business today. Building a trust-based organi-

zational culture is important because it can foster knowledge transfer and, thus, innovation. Trust also has an impersonal dimension. This includes the acceptance by employees of the credibility of the organization. Impersonal trust also has significant organizational value and contributes to creating an innovative climate (Krot & Lewicka, 2020). When trust is present, AI capabilities can help clarify professional issues, and their use does not lead to performance degradation.

Trust can also be viewed in another way, e.g., when a loss of trust occurs because of a relationship established during work. Another critical aspect of the relationship between trust and technostress is trust in collaborative IT service providers. Organizations are intensively involved in such cooperation, which can lead to mutual benefits. Trust serves as an intervening mechanism through which collaborative intensity enhances performance. Trust has a mediating role, and distrust has a moderating role (Rezvani & Khosravi, 2019). Trust plays a vital role in corporate knowledge acquisition, dissemination, and use. Not only are knowledge processes accelerated by trust, but

also trust is increased by knowledge transmission (Miković et al., 2020).

Therefore, based on the literature review, the study tests the hypotheses formulated as follows, which seek to reflect the research questions formulated:

H1: The effects of technostress on competitive employees vary by age, gender, education, and position.

H2: Technostress impacts the quality of life, including psychological well-being at home and work-related confidence.

2. METHODS

The 2021 survey was conducted with employees of organizations in the business sector. Respondents were asked to voluntarily fill in a questionnaire anonymously on the internet, distributed via social media platforms, in person and online. Before filling in the questionnaires, test interviews were conducted, during which respondents did not find any questions they could not interpret. The questions were closed questions (95%), of which 80% were based on a 5-point Likert scale. Tarafdar et al. (2007) have already tested the questionnaire used for this survey. The response rate was around 9%, with a total of 531 questionnaires returned

out of 6000 sent out, all of which were assessable. Univariate and multivariate statistical methods (mean, standard deviation, factor analysis, ANOVA, SEM) were used to analyze the research results.

3. RESULTS

Sample characteristics are summarized in Tables 2 and 3.

Keeping the statements of the original questionnaire (Tarafdar et al., 2007), the questionnaire in this study was formulated according to the distinct areas of technostress: technological overload, technological invasion, technological complexity, technological threat, and technological uncertainty. Within these groups of questions, respondents could indicate the strength of their agreement. One indicated no agreement at all, while five indicated complete agreement. Table 4 summarizes the respondents' judgments along the lines of these questions.

According to workers, technological overload results from new technologies requiring a faster work pace, complex thinking, and an integrated vision. The invasion of technology is already affecting the private sphere. It impacts the need to be constantly on call at work, making it harder to separate work and private life.

Table 2. Characteristics of respondents

Source: Own elaboration.

Characteristics	%	Characteristics	%
Gender	62.6% male; 37.4% female	Highest level of education	55.7% graduation; 44.3% degree
Age	≤ 25 years 3.6%; 25-35 years 33%; 35-45 years 36.8%; 45-55 years 18.6%; ≥ 55 8%	Position	51.4% staff members; 48.6% leaders

Table 3. Organizational characteristics

Source: Own elaboration.

Activity of organizations	Respondents %	Size of companies	Respondents %	Legal form of organization	Respondents %
Info-communication	15.5	Large	34.5	Ltd	47.2
Transport and storage	12.4	Medium	25.4	Llc	2.8
Education	11.3	Small	24	Plc	4
Scientific, technical activities	6.2	Micro	16.1	–	–
Administrative	5.6	–	–	–	–

Table 4. Characteristics and effects of technostress (mean, standard deviation, factor weights)

Source: Own elaboration adapted from the questionnaire developed by Tarafdar et al. (2007, 2010, 2011).

Technostress creators	Statements	Mean	Std. deviation	Factor weights
Technological overload Cronbach's Alpha: 0.801	(K_1a) "I am forced by this technology to work much faster"	3.73	1.230	0.599
	(K_1b) "I am forced by this technology to do more work than I can handle"	2.91	1.294	0.795
	(K_1c) "I am forced by this technology to work with very tight time schedules"	3.11	1.277	0.774
	(K_1d) "I am forced to change my work habits to adapt to new technologies"	3.40	1.321	0.540
	(K_1e) "I have a higher workload because of increased technology complexity"	3.30	1.330	0.808
Technological invasion Cronbach's Alpha: 0.789	(K_1f) "I spend less time with my family due to this technology"	2.79	1.409	0.723
	(K_2a) "I have to be in touch with my work even during my vacation due to this technology"	2.81	1.421	0.844
	(K_2b) "I have to sacrifice my vacation and weekend time to keep current on new technologies"	2.35	1.324	0.888
Technological complexity Cronbach's Alpha: 0.860	(K_2c) "I feel my personal life is being invaded by this technology"	3.15	1.432	0.787
	(K_3a) "I do not know enough about this technology to handle my job satisfactorily"	2.19	1.175	0.825
	(K_3b) "I need a long time to understand and use new technologies"	2.53	1.270	0.867
	(K_3c) "I do not find enough time to study and upgrade my technology skills."	2.53	1.247	0.746
	(K_3d) "I find recruits to this organization know more about computer technology than I do"	2.76	1.342	0.711
Technological insecurity Cronbach's Alpha: 0.781	(K_3e) "I often find it too complex for me to understand and use new technologies"	2.30	1.209	0.865
	(K_4a) "I feel a constant threat to my job security due to new technologies"	1.91	1.053	0.788
	(K_4b) "I have to constantly update my skills to avoid being replaced"	2.57	1.257	0.668
	(K_4c) "I am threatened by co-workers with newer technology skills"	1.90	1.049	0.848
	(K_4d) "I do not share my knowledge with my co-workers for fear of being replaced"	1.61	1.040	0.637
Technological uncertainty Cronbach's Alpha: 0.784	(K_4e) "I feel there is less sharing of knowledge among co-workers for fearing of being replaced"	2.17	1.230	0.727
	(K_5a) "There are always new developments in the technologies we use in our organization"	3.73	1.149	0.736
	(K_5b) "There are constant changes in computer software in our organization"	2.85	1.275	0.873
	(K_5c) "There are constant changes in computer hardware in our organization"	2.58	1.186	0.830
	(K_5d) "There are frequent upgrades in computer networks in our organization"	3.00	1.177	0.668

Technological complexity increases competition between workers, which can weaken teamwork and negatively affect self-esteem. In addition, employees must keep up with the pace of learning and using technology to avoid falling behind and being penalized. This effect can lead to harmful discrimination.

Technological insecurity creates a sense of threat and reinforces the need for consistent performance. It has a detrimental effect on knowledge transfer within the organization due to the risk of job loss. Lack of knowledge transfer or gaps in knowledge transfer impedes the learning of technology, so the potential benefits and additive values of advanced solutions cannot be unlocked. This self-stimulating spiral can lead to a slowdown and stalling of technological development and innovation.

The uncertainty factor is not only manifested in a lack of technical knowledge but also in a speed of learning that is not in line with the constant re-

placement of hardware and software and the pace of change. The difference between the two speeds can result in superficial knowledge, inadequate depth of knowledge embedded, and errors and gaps.

The high values of the standard deviations indicate that there was no unanimity of opinion among respondents when evaluating the statements. In particular, there was heterogeneity of opinion regarding the technological invasion (presumably, different workplace expectations, cultural characteristics and individual workloads, and family situations strongly influenced this assessment).

For further analyses, the five technology characteristics (with their constituent variables) were transformed into principal components, which retain the name of the technostress characteristic: technological overload, technological invasion, technological complexity, technological insecurity, and technological uncertainty (Tarafdar et al.,

2007). The component values are shown in the fifth column of Table 4, while Cronbach's Alpha values are shown in the first column.

It was examined whether a correlation could be detected between the individual characteristics. The analyses confirm that a significant relationship was demonstrated in all cases. The more strongly they perceive the increase in the burden of technology, the more they experience negative impacts related to quality-of-life issues ($r: 0.558$). Feelings of overload are also increased by uncertainty ($r: 0.272$) and vulnerability ($r: 0.352$). At the same time, the more complex the technology and hence the more complex the demands, the more overloaded ($r: 0.401$), the more threatened ($r: 0.501$), and insecure ($r: 0.208$) they feel.

Studies have also looked at whether specific demographic characteristics influence the stress generated by technology. Gender, age, education, and occupation were examined to see if any differences could be identified for the technology characteristics listed in Table 4. The results of the ANOVA

tests are summarized in Table 5. It can be seen how each demographic group perceives a particular characteristic and how the groups under study differ significantly in these respects. Where significant differences are found, the ANOVA results and strength of association are also indicated.

Technological features and changes have a more substantial impact on men than women. However, it is those aged 45 and over who feel the challenges more strongly. Typically, those with a secondary education find it harder to cope with the stresses generated by technology, although the feeling of insecurity is more pronounced among graduates. Managers have to make strategic technology decisions more often and are therefore more affected by technological uncertainty and threat.

Overall, the employees in this study encounter several effects that generate technostress. However, demographically, the depth of the impacts varies, and they do not affect the mental and emotional well-being of the study participants in the same way. Therefore, based on the above results, Hypothesis 1 is confirmed.

Table 5. Perception of technological phenomena in the light of demographic characteristics

Source: Own elaboration.

Technological creators	Demographic characteristics			
	Gender (male/female)	Age	Education (graduation/degree)	Position (staff members/leaders)
Technological overload	Men feel it more strongly	Those under 25 feel it most	Those with secondary education feel more strongly	Staff feel more strongly
Technological invasion	Men feel it more strongly	25-35 year olds feel the most	Those with secondary education feel more strongly Significant differences by level of education F: 9.377 sign.: 0.003 $\eta^2: 0.054$	Leaders feel more strongly
Technological complexity	Women feel it more strongly	Those aged 55 and over feel it most Significant differences by age group F: 2.424 sign.: 0.016 $\eta^2: 0.034$ weak impact	Higher-educated people feel more strongly Significant differences by level of education F: 4.136 sign.: 0.044 $\eta^2: 0.024$ weak impact	Staff feel more strongly
Technological insecurity	Men feel it more strongly	Those aged 55 and over feel it most	Those with secondary education feel more strongly	Leaders feel more strongly
Technological uncertainty	Men feel it more strongly Significant difference between genders F: 4.617 sign.: 0.032 $\eta^2: 0.013$ weak impact	Those aged 45 and over feel it most	Higher-educated people feel more strongly	Leaders feel more strongly

Note: $p = 0.05$.

Table 6. Relationship between technological stress and trust

Source: Own elaboration adapted from the questionnaire developed by Tarafdar et al. (2007, 2010, 2015).

	Statements	Mean	Std. deviation
Technological stress and trust	"The possibilities offered by artificial intelligence give me more confidence in my work"	2.95	1.208
	"Technical difficulties often make me distrust my colleagues/manager"	1.88	1.031
	"I often feel clueless when using technical tools/software"	2.30	1.239
	"I trust human cooperation more than technology"	3.29	1.227
	"The constant use of technology in my private life has a negative impact on my work"	1.97	1.149
	"I often feel my data/results are at risk"	2.41	1.311

Next, the impact of technostress on organizational trust and personal life was investigated. Finally, regarding the relationship between technostress and trust, respondents were asked to decide on several statements how much they agreed with the statement. In this respect, the mean and standard deviation results are summarized in Table 6.

Respondents have more trust in personal interaction between people than in technology. They distrust some factors in the operation of new systems, such as successful outputs of their work, which are due to poor or under-utilized technology. Collaborative work and the resulting trust that stems from human resources are not perceived as being at risk by respondents. They do not believe that their preoccupation with the technology used outside the workplace has a negative impact on their work. However, technological solutions at work often require them to be on call, even at home, i.e., the counteracting effect (workplace expectations) has an impact on the difficulty of reconciling work and private life.

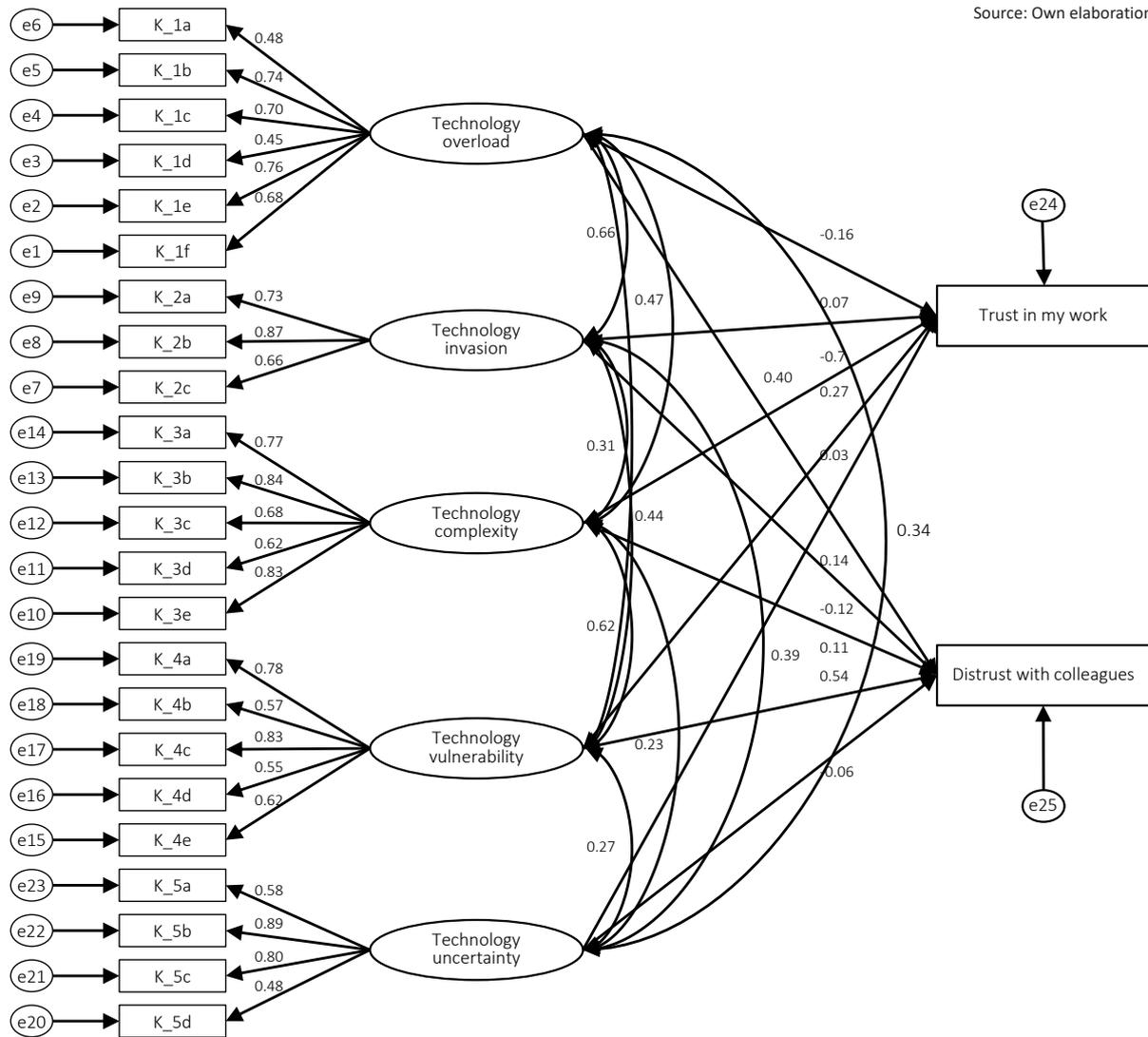
The analysis also looked at how different technological features affect trust within the organization. To this end, the previously established principal components (technological overload, technological invasion, technological complexity, technological insecurity, technological uncertainty) (Tarafdar et al., 2007) were examined to see how they affect trust. The first two findings in Table 6 are that technology gives confidence at work and that technological difficulty creates distrust among employees.

The relationship between the variables was analyzed. The study used a model built with SPSS AMOS version 27. Figure 1, in addition to the latent and test variables, marked the error variables (circled) in the figure. The error variables have been ignored in the analysis.

There are a number of criteria for testing the adequacy of the model, which were examined. The Chi-square was significant (810.816, $df = 257$, $p = 0.00$). This is not enough to reject the fit of the model since the significance of the Chi-square is stronger after a sample number above 200. The RMSEA (Root Mean Square Error Approximation) value = 0.064, which should typically be below 0.08. For Incremental Model Fit, CFI = 0.895, NFI = 0.855, TLI = 0.867. For Parsimonious Fit, the Chi squared/df value was 3.155. Based on these, the model is accepted.

Figure 1 shows the relationship between technostress, work-related trust, and trust among co-workers. There is a robust correlation between the different stress factors, and their stimulating effect on each other is not questionable. For example, the greater the technological invasion, the stronger the feeling of technological overload among employees. Increasing technological complexity strongly increases technological vulnerability, etc. Technological overload and vulnerability significantly impact trust, namely trust generated by artificial intelligence and distrust between employees. If employees have the time to learn and get to know technological systems, they will have more trust in them when using them and thus make fewer mistakes. This can foster trust between staff and support teamwork and information sharing. Based on the results, Hypothesis 2 is accepted.

Source: Own elaboration.



Note: K factors are indicated in Table 1.

Figure 1. Technology stress and trust relationship

4. DISCUSSION

The study shows that workers in the competitive sector are experiencing the consequences of the technostress phenomenon. These findings support previous research that there is a strong relationship between the characteristics of technostress and that their mutually reinforcing effects undoubtedly affect the quality of daily work and work-life balance. In addition, this result supports Tarafdar et al. (2007, 2010, 2015).

The faster pace of work dictated by new technologies, the need for complex thinking, and the need for an integrated vision are expressed.

Consequently, the boundaries between work and private life are blurred, and competition between workers is intensified, leading to tensions and an unhealthy workplace climate. Evidence of this is provided by a slightly different perspective (Tams et al., 2018), which shows that the problem manifests itself in job satisfaction and turnover. In addition, it increases absenteeism and works against teamwork.

The constant pressure to perform has a detrimental effect on knowledge transfer within the organization and increases the risk of losing one's job. In addition, insecurity is caused by a lack of technological knowledge, and the speed of learn-

ing differs from the pace of change. This can lead to superficial knowledge and frequent mistakes. Although the respondents' opinions were not all at the same level, this can be attributed to differences in workplace expectations, cultural characteristics, individual workloads, and family expectations (results in Table 4).

Studies have shown that certain demographic characteristics influence the stress generated by technology. Technological change affects men more than women, and those aged 45 and over experience the challenges more intensely. Those with a secondary education have a more challenging time coping with technology-induced stress, but the feeling of uncertainty is more common among graduates. Because of the frequency of strategic

decisions, managers' feelings of uncertainty and threat are stronger (results in Table 5).

The impact of technostress on organizational trust and private life is also evident. In terms of trust, respondents prefer personal interaction between people rather than technology. They do not feel that the operation of new systems threatens collaboration and trust and that using technology outside the workplace does not affect their work activities. However, technological solutions at work require them to be on standby, even at home, which means that workplace expectations influence work-life balance. Technological overload and threats significantly impact trust, especially trust generated by artificial intelligence and distrust between co-workers (see Figure 1).

CONCLUSION

The aim of this study was, among other things, to investigate how each of the technostress parameters influences each other, how they affect employees, work-life balance, etc. There is a robust correlation between the different stress factors, and their stimulating effect on each other is not questionable. Overall, the more strongly workers feel the increase in the burden of technology, the more they experience the negative effects on their quality of life. Overload brings uncertainty and a feeling of being at risk. The more complex the technology requirement, the greater the sense of overload and danger, and the more prevalent the feeling of insecurity. Demographics vary in terms of exposure, and the effects are not the same on study participants' mental and emotional well-being. It is worth bearing in mind the impact on workplace trust, which can be strongly influenced by managerial support and attention.

The results of this paper draw the attention of managers and practitioners to the need to keep technostress triggers low in their organizations. Corporate culture is essential in building trust, and managers play a central role. In addition, training on technology should be made widely available to employees throughout the organization.

This research topic is recommended for those who wish to study this subject. For future research, it is crucial to consider the conjunction with other areas of the company that affect the work of human resources in other ways. It is worthwhile to carry out further research in international comparison, in particular, comparing economically developed and less developed regions. The general ability of the results is limited, mainly due to the lack of sample representativeness. In addition, the respondents are employees in the competitive sector, so employees in other sectors may have different opinions and attitudes. Nevertheless, comparison can be a future research objective.

AUTHOR CONTRIBUTIONS

Conceptualization: Andrea Bencsik, Tímea Juhász.

Data curation: Andrea Bencsik, Tímea Juhász.

Formal analysis: Andrea Bencsik, Tímea Juhász.

Investigation: Andrea Bencsik, Tímea Juhász.

Methodology: Andrea Bencsik, Tímea Juhász.

Writing – original draft: Andrea Bencsik, Tímea Juhász.

Writing – review & editing: Andrea Bencsik, Tímea Juhász.

ACKNOWLEDGMENT

This study is supported by the Research Centre at Faculty of Business and Economics (No. PE-GTK-GSKK A095000000-4) of University of Pannonia (Veszprém, Hungary).

REFERENCES

1. Al-Ansari, M. A., & Aalshare, K. (2019). The impact of technostress components on the employees satisfaction and perceived performance: The case of Qatar. *Journal of Global Information Management*, 27(3), 65-86. <https://doi.org/10.4018/JGIM.2019070104>
2. Arnetz, B. B., & Wiholm, C. (1997). Technological stress: Psychophysiological symptoms in modern offices. *Journal of Psychosomatic Research*, 43(1), 35-42. [https://doi.org/10.1016/S0022-3999\(97\)00083-4](https://doi.org/10.1016/S0022-3999(97)00083-4)
3. Ayyagari, R., Grover, V., & Purvis, R. (2011). Technostress: Technological antecedents and implications. *MIS Quarterly*, 35(4), 831-858. <https://doi.org/10.2307/41409963>
4. Bencsik, A., Jakubik, M., & Juhász, T. (2020). The economic consequences of trust and distrust in knowledge-intensive organizations. *Journal of Competitiveness*, 12(3), 28-46. <https://doi.org/10.7441/joc.2020.03.02>
5. Brillhart, P. E. (2004). Technostress in the workplace: Managing stress in the electronic workplace. *Journal of American Academy of Business*, Cambridge, 5, 302-307.
6. Brivio, E., Gaudio, F., Vergine, I., Mirizzi, C. R., Reina, C., Stellari, A., & Galimberti, C. (2018). Preventing technostress through positive technology. *Frontiers in Psychology*, 9. <https://doi.org/10.3389/fpsyg.2018.02569>
7. Brod, C. (1984). *Technostress: The human cost of the computer revolution*. Reading, MA: Addison-Wesley.
8. Caro, D., & Sethi, A. S. (1985). Strategic management of technostress. The chaining of Prometheus. *Journal of Medical Systems*, 9(5-6), 291-304. <https://doi.org/10.1007/bf00992568>
9. Champion, S. (1988). Technostress: Technology's toll. *School Library Journal*, 35(3), 48-51.
10. Cooper, C. L., Dewe, P. J., & O'Driscoll, M. P. (2001). *Organizational stress: A review and critique of theory, research and applications*. Sage Publications.
11. European Environmental Agency (EEA). (2013). *Late lessons from early warnings: Science, precaution, innovation* (EEA Report No. 1/2013). Luxembourg: Publications Office of the European Union. Retrieved from <https://www.eea.europa.eu/publications/late-lessons-2>
12. Hallowell, E. H. (2005). Overloaded circuits: Why smart people underperform. *Harvard Business Review*, 83(1), 54-62, 116. Retrieved from <https://pubmed.ncbi.nlm.nih.gov/15697113/>
13. Harremoës, P., Gee, D., MacGarvin, M., Stirling A., Keys, J., Wynne, B., & Vaz, S. G. (Eds.). (2001). *Late lessons from early warnings: The precautionary principle 1896-2000* (Environmental Issue Report No. 22/2001). Copenhagen: European Environmental Agency. Retrieved from https://www.eea.europa.eu/publications/environmental_issue_report_2001_22
14. Himma, K. E. (2007). The concept of information overload: A preliminary step in understanding the nature of a harmful information-related condition. *Ethics and Information Technology*, 9(4), 259-272. <https://doi.org/10.1007/s10676-007-9140-8>
15. Ioannou, A., & Papazafeiropoulou, A. (2017). Using IT mindfulness to mitigate the negative consequences of technostress. *Twenty-third Americas Conference on Information Systems*. Boston. Retrieved from <https://aisel.aisnet.org/amcis2017/AdoptionIT/Presentations/7/>
16. iPass. (2011). *The iPass global mobile workforce report: Understanding enterprise mobility trends and mobile usage*. Redwood Shores. Retrieved from http://www3.ipass.com/wp-content/uploads/2011/05/iPass_MWR_Q2_2011.pdf
17. Jena, K. (2015). Technostress in ICT enabled collaborative learning environment: An empirical study among Indian academicians. *Computers in Human Behavior*, 51(Part B), 1116-1123. <https://doi.org/10.1016/j.chb.2015.03.020>
18. Krot, K., & Lewicka, D. (2020). Relationship between impersonal trust and innovative culture: An empirical study. *E&M Economics and Management*, 23(3), 82-100. <https://doi.org/10.15240/tul/001/2020-3-006>
19. Kupersmith, J. (1992). Technostress and the reference librarian. *Reference Services Review*, 20(2), 7-50. <https://doi.org/10.1108/eb049150>
20. Kupersmith, J. (2003). Library technostress survey results. *Zenfolio/John Kupersmith*. Retrieved July 20, 2015, from <https://www.jkup.net/tstress-survey-2003>

21. La Torre, G., De Leonardis, V., & Chiappetta, M. (2020). Technostress: How does it affect the productivity and life of an individual? Results of an observational study. *Public Health*, 189, 60-65. <https://doi.org/10.1016/j.puhe.2020.09.013>
22. Maier, C., Laumer, S., Wirth, J., & Weitzel, T. (2019). Technostress and the hierarchical levels of personality: A two-wave study with multiple data samples. *European Journal of Information Systems*, 28(5), 496-522. <https://doi.org/10.1080/0960085X.2019.1614739>
23. Miković, R., Petrović, D., Mihić, M., Obradović, V., & Todorović, M. (2020). The integration of social capital and knowledge management – The key challenge for international development and cooperation projects of nonprofit organizations. *International Journal of Project Management*, 38(8), 515-533. <https://doi.org/10.1016/j.ijproman.2020.07.006>
24. Némethy, K., & Poór, J. (2018). A jövő munkahelye az IPAR 4.0 tükrében. *Opus et Educatio*, 5(2), 216-224. (In Hungarian). <http://dx.doi.org/10.3311/ope.251>
25. Pirkkalainen, H., Salo, M., Tarafdar, M., & Makkonen, M. (2019). Deliberate or instinctive? Proactive and reactive coping for technostress. *Journal of Management Information Systems*, 36(4), 1179-1212. <https://doi.org/10.1080/07421222.2019.1661092>
26. Popma, J. (2013). *The Janus face of the 'New Ways of Work' rise, risks and regulation of nomadic work* (Working Paper No. 2013.07). Brussels: ETUI aisbl. (In Hungarian). Retrieved from https://www.etui.org/sites/default/files/tech-nostress_HU.pdf
27. Rezvani, A., & Khosravi, P. (2019). Emotional intelligence: The key to mitigating stress and fostering trust among software developers working on information system projects. *International Journal of Information Management*, 48, 139-150. <https://doi.org/10.1016/j.ijinfomgt.2019.02.007>
28. Salanova, M., Llorens, S., & Cifre, E. (2013). The dark side of technologies: Technostress among users of information and communication technologies. *International Journal of Psychology*, 48(3), 422-436. <https://doi.org/10.1080/0207594.2012.680460>
29. Salo, M., Pirkkalainen, H., & Koskelainen, T. (2019). Technostress and social networking services: Explaining users' concentration, sleep, identity, and social relation problems. *Information Systems Journal*, 29(2), 408-435. <https://doi.org/10.1111/isj.12213>
30. Sareen, P. (2019). Techno stress creators – An exploratory research on teaching and non teaching staff working in colleges. *International Journal of Management and Humanities (IJMH)*, 3(9), 1-7. Retrieved from <https://www.ijmh.org/wp-content/uploads/papers/v3i9/I0241043919.pdf>
31. Saunders, C., Wiener, M., Klett, S., & Sprenger, S. (2017). The impact of mental representations on ICT-related overload in the use of mobile phones. *Journal of Management Information System*, 34(3), 803-825. <https://doi.org/10.1080/07421222.2017.1373010>
32. Swanson, E. B., & Ramiller, N. C. (2004). Innovating mindfully with information technology. *MIS Quarterly*, 28(4), 553-583. <https://doi.org/10.2307/25148655>
33. Tams, S., Legoux, R., & Léger, P. M. (2018). Smartphone withdrawal creates stress: A moderated mediation model of nomophobia, social threat, and phone withdrawal context. *Computers in Human Behavior*, 81, 1-9. <https://doi.org/10.1016/j.chb.2017.11.026>
34. Tarafdar, M., Gupta, A., & Turel, O. (2015). Editorial special issue on 'dark side of information technology use': An introduction and a frame-work for research. *Information Systems Journal*, 25(3), 161-170. <http://doi.org/10.1111/isj.12070>
35. Tarafdar, M., Maier, C., Laumer, S., & Weitzel, T. (2020). Explaining the link between technostress and technology addiction for social networking sites: A study of distraction as a coping behavior. *Information System Journal*, 30(1), 1-214. <https://doi.org/10.1111/isj.12253>
36. Tarafdar, M., Tu, Q., & Ragu-Nathan, T. S. (2010). Impact of technostress on end-user satisfaction and performance. *Journal of Management Information Systems*, 27(3), 303-334. <https://doi.org/10.2753/MIS0742-1222270311>
37. Tarafdar, M., Tu, Q., Ragu-Nathan, B. S., & Ragu-Nathan, T. S. (2007). The impact of technostress on role stress and productivity. *Journal of Management Information Systems*, 24(1), 301-328. <http://doi.org/10.2753/MIS0742-1222240109>
38. Thomée, S., Härenstam, A., & Hagberg, M. (2011). Mobile phone use and stress, sleep disturbances, and symptoms of depression among young adults – A prospective cohort study. *BMC Public Health*, 11(66). <https://doi.org/10.1186/1471-2458-11-66>
39. Thomée, S., Dellve, L., Härenstam, A., & Mats, H. (2010). Perceived connections between information and communication technology use and mental symptoms among young adults - A qualitative study. *BMC Public Health*, 10(1), 66. <https://doi.org/10.1186/1471-2458-10-66>
40. Thomée, S., Eklöf, M., Gustafsson, E., Nilsson, R., & Hagberg, M. (2007). Prevalence of perceived stress, symptoms of depression and sleep disturbances in relation to information and communication technology (ICT) use among young adults - an explorative prospective study. *Computers in Human Behavior*, 23(3), 1300-1321. <https://doi.org/10.1016/j.chb.2004.12.007>
41. Tu, Q., Wang, K., & Shu, Q. (2005). Computer-related technostress in China. *Communications of the ACM*, 48(4), 77-81. <https://doi.org/10.1145/1053291.1053323>