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# Technostress and Related Managerial Variables: A Global Perspective

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**Abstract**

Technological innovations have influenced organizations' business activities. In the study of technostress in management, the aim was to evaluate the perception of technostress created by technological changes and developments among employees. To achieve this goal, studies published in the WoS literature were examined. The research utilized a bibliometric analysis method. The analysis focused on the key terms and conceptual relationships that the authors frequently emphasized in their studies. Some of the key concepts that were often highlighted by the authors include technostress, covid-19, performance, social media, stress, information overload, overload, job satisfaction, technology, burnout, digital transformation, technostress creators, productivity, work-family conflict, digitalization, strain, coping, job, job performance, techno-overload, digital, emotional exhaustion, satisfaction, self-efficacy, work-life balance, anxiety, exhaustion, well-being, and work engagement. When considering the relationships between these concepts, it was found that technostress, covid-19, burnout, productivity, stress, work-family conflict, job satisfaction, work engagement, technology, coping, higher education, digital transformation, work-life balance, techno-stressors, digital stress, anxiety, health, academic performance, online learning, technostress creators, ICT, job burnout, digital, innovation, information technology, covid-19 pandemic, remote work, and self-efficacy form strong connections together. Regarding centrality and density, technostress creators, job burnout, personality, technostress inhibitors, organizational commitment, personality traits, compliance intention, compulsive usage, eustress, and job engagement were found to have strong relationships. Implementing technological and digital transformations after employees have experienced them may lead to healthier outcomes. Particularly for individuals who enjoy technology and can apply technological innovations in their lives, stress factors may be at lower levels.

## 1. Introduction

Technostress is an emerging interdisciplinary field that enables comprehensive assessments across all levels of management and sociocultural contexts, encompassing both working and non-working individuals. It holds significant potential for scholarly inquiry across various professions, occupational settings, and employee categories. The field also allows for the examination of diverse methods, technological tools, and social interaction models—including face-to-face, remote, and flexible work arrangements (Salazar, Ficapal-Cusí, Boada-Grau and Camacho, 2021). These avenues provide organizations not only with the ability to adapt to technological advancements but also with the potential to exhibit resistance. The perception and management of technostress within organizational leadership have a direct influence on broader operational activities. Technological changes are implemented by employees by established management policies, meaning that how technostress is understood and addressed at the managerial level fundamentally shapes the execution of organizational functions.

Today's organizations gain significant advantages by integrating technological capabilities into their business activities. During the integration process, both managers and employees may show resistance to technological innovations. Technological changes and advancements make it mandatory for individuals to adapt to these innovations. Particularly in organizations, technological innovations in the execution of business activities are changing the way employees perform their tasks. Moreover, technological changes can lead to job loss for employees. This situation causes technological innovations to become more effective in organizations, while employees may fade into the background depending on their roles. The replacement of human labor with machines in order to increase organizational productivity and profitability further triggers the formation of stress. In this sense, technological changes increase the emergence of stress in many employees. Technostress elements, therefore, can have various effects at the individual, managerial, organizational, and societal levels. Although technostress factors are diverse in today's organizations, they can significantly impact individuals' (subordinates, superiors, all employees) concerns and goals for the future.

Technostress creates a significant management concern because it affects employees' well-being, organizational productivity, and success levels in the workplace (Ioannou, Lycett and Marshan, 2024). Failure to address this concern can lead to serious negative consequences. In this regard, managers need to keep themselves open to innovations to adapt to technological changes. This situation particularly creates stress among managers who prioritize stability in organizational activities. Managers who struggle to change their habits may find it difficult to adapt to technological innovations. This can lead to disruptions in work processes and cause stress in managers due to technological reasons. The perception of technostress in the management mechanism may have negative impacts on employees.

The increasing use of information technologies in organizational activities makes it necessary to examine the impact and prevalence of technostress factors (Kumar, 2024). Although researching technostress in organizations is valuable, it is not clear which technological features specifically lead to stress (Ayyagari, Grover and Purvis, 2011). This study emphasizes the pressures created by technological changes in the management mechanism and the challenges that may arise in terms of adapting to innovations. The variables that contribute to the formation of technostress are explained. In this context, the interactions of both internal and external stakeholders with technostress are systematically examined. The effects of technostress are discussed not only from the perspective of employees but also from the perspective of managers or the management mechanism. By adopting a holistic perspective, the study aims to reveal how technostress influences decision-making processes, organizational performance, and strategic adaptability. Furthermore, it seeks to contribute to the development of more resilient management practices that can effectively mitigate the adverse effects of technostress while fostering innovation-driven organizational growth.

## 2. Literature Review

### 2.1. Stress and Technostress

Stress is an imbalance caused by the pressure of various environmental factors on individuals. The stress created by computers and information technologies is technostress. Technostress has negative consequences on employees' attitudes (Taneja and Singh, 2018). Technostress can be considered as the negative psychology and discomfort resulting from the use of modern technology in business activities (Kumar, 2024). The literature includes two components of technostress, which have both positive and negative characteristics. In the first component, technoeustress is described as a form of stress that positively contributes to an individual's work activity or organizational effectiveness. In the second component, technodistress is explained as a form of stress that hurts an individual's work activity or organizational effectiveness (Selye, 1974, cited in Caro, A., A., and Sethi, 1985). In some studies, the concepts of techno-overload and techno-complexity are considered indicators of technostress (Dragano and Lunau, 2020). Techno-overload and techno-complexity represent distinct manifestations of technostress experienced by employees as a result of the excessive use and demands of digital technologies (Leitner and Liepert, 2024). In this regard, it should be noted that technostress not only has negative aspects but also may have positive aspects, depending on the components that create it. Especially, stress can have positive effects on the execution of business activities up to a certain point. However, if technostress becomes excessive, disruptions in business activities may occur. In this case, the negative aspects of stress become more dominant. In the relevant literature, the negative aspects of technostress are generally emphasized.

In terms of corporate connections and work culture, people around the world frequently use remote working methods and digital technologies (Kumar, 2024). Employees' technostress has a detrimental nature for the organization (Martínez-Navalon, Gelashvili, Dematos, and Herrera-Enríquez, 2023). In this regard, reducing technostress in organizations not only increases individual productivity but also enhances job satisfaction. The continuous implementation of innovation changes by organizations for efficiency does not eliminate technostress

(Sanjaya, Do, Salim and Moko, 2018). This shows that the continuity of technological innovations in business activities can affect the persistence of technostress. In the formation of technostress, factors such as individual characteristics, management policies, organization, and work culture may also play a role.

Stress is a phenomenon that is increasingly felt deeply by individuals, particularly due to its negative effects. It can generally affect all employees within organizations. Technological innovations and changes can create technostress because they lead to changes in individuals' work habits. Tarafdar, Tu, Ragu-Nathan and Ragu-Nathan (2007) emphasized that developments in information and communication technologies alone do not create stress, but the role individuals play in their organizations is also a factor that increases stress. Mahboob and Khan (2016) stated that stress arising from work activities in organizations has detrimental effects on employees' productivity and morale. They also mentioned that this stress increases absenteeism and turnover in the workplace. Salo, Pirkkalainen, Makkonen and Hekkala (2018, p. 4) noted that technostress causes both positive (eustress) and negative (distress) emotional experiences in individuals. Soukupová, Kocourková and Drahotová (2024) highlighted that stress awareness and management are effective in preventing emergence of stress and emphasized the need to act in alignment with the work environment and employee needs.

## 2.2. Management and Technostress

In stress theory, stress management is used to focus on improvements in organizational effectiveness (Kim and Lee, 2021). Technostress factors in organizations are of strategic concern for the management mechanism. These factors reduce profit margins, lead to internal conflicts, and result in low service standards within organizations (Caro et al., 1985). In this regard, managers can enhance psychological well-being by reducing technostress in organizations. This fosters a sense of trust among employees, which in turn contributes to their performance (Jaiswal et al., 2024). Technostress in management will affect both managers and employees. While employees may experience decreased job satisfaction, increased anxiety, and reduced productivity due to technostress, managers may face challenges in maintaining team cohesion, ensuring technological adaptation, and sustaining overall organizational efficiency. Consequently, technostress can undermine both individual well-being and broader managerial effectiveness, necessitating proactive interventions at multiple organizational levels.

Digital technologies impact organizations, collaboration, sustainable activities, and inclusivity (Lim and Hwang, 2024). Today, many managers focus on what can be achieved with digital technologies. However, the negative effects of digital technologies are rarely considered. Digitalization strengthens technostress in employees. In this regard, technostress increases employees' intentions to leave their jobs (Sharma, Tiwari, Gupta and Rana, 2024). The management mechanism's measures to prevent technostress aim to change individuals' behaviors in their social environments. Technostress also affects individuals' internal factors, such as knowledge, skills, and experience (Berger, Schäfer, Schmidt, Regal and Gimpel, 2024). This indicates that both internal dispositions and external behavioral traits of individuals influence the impact of technostress. Technostress exerts a profound effect on individuals' psychological well-being, emotional stability, social interactions, and institutional engagement. Mitigating technostress requires not only fostering healthy manager-employee relations but also ensuring that organizational policies are implemented in a supportive and adaptive manner.

In the literature, Caro et al. (1985) emphasize that individuals with high self-esteem, problem-solving skills, a sense of personal competence, and the ability to solve cognitive complexity have higher abilities to adapt to technological changes in terms of technostress. Wang, Shu and Tu (2008) highlight that managers in organizations need to reduce employees' stress related to technology and psychological anxiety to achieve better job performance while keeping stress at a positive threshold. They also mention that to reduce technostress, organizations need to create learning organizations, appropriate empowerment, and adequate training opportunities. Taneja and Singh (2018) state that it is necessary to limit the use of variables such as computers, mobile phones, and televisions to reduce technostress for employees. Managers express that respect should be shown for employees' personal life spaces outside working hours. Okolo, Kamarudin and Ahmad (2019) argue that technostress in organizations can be prevented. They emphasize that early control or management of technological changes can lead to fewer mistakes, changes during processes, and lower levels of stress. Tarafdar, Salo, Pirkkalainen and Makkonen, (2020) suggest that to cope with technostress in the workplace, the management mechanism should support employees and guide them, enabling them to become equipped and capable.

Technostress in management affects all employees in organizational activities. Technological innovations play a leading role in achieving organizations' future goals. Particularly, organizations that focus on technology-driven activities need to maintain a balance in the technostress levels of their employees. Managers or employees may require various training programs to adapt to technological changes. External support may also be needed to transform employees' perceptions of stress into a more positive understanding. In this regard, technostress should be considered within organizations. This study aims to clarify the interaction between technostress and the management mechanism.

## 3. Methodology

The bibliometric analysis method shows the trend and structural composition of a research area. Bibliometric analysis enables the management of large data through conceptualization. It is particularly suitable for reviews with large amounts of data. This method provides opportunities such as mapping a research field, examining significant publications for discussion, understanding the development process of research topics, and gaining information about authors and journals (Passas, 2024). In this study, a large amount of data has been used. General information about studies conducted in the literature has been provided. The general trends on the topic have been identified. The technological changes and stress factors in the management field have been evaluated together. The research in the literature has been discussed, and recommendations have been made to managers, employees, and researchers working on the topic.

The bibliometric analysis method can be considered an open-source tool for conducting comprehensive scientific mapping analyses in the scientific literature. The R program is flexible, allowing it to be applied in an integrated manner with other statistical and graphical packages (Aria and Cuccurullo, 2017). In this study, bibliometric analyses were conducted using the R program infrastructure. The data in the R program were obtained from the WoS database. The results of the research on technostress in management were presented and interpreted in a graphical format. Various inferences were made based on previous studies conducted on the topic. The research was carried out in the WoS database on 15.11.2024. The sample of the study consists of a total of 473 articles. No restrictions were applied regarding language or field categories in the study.

### 3.1. Purpose of the Research

In this study, the aim is to evaluate technostress within the framework of both the management mechanism and employees. The study emphasizes that technostress is important not only for lower levels but for all levels. Managers should prioritize accepting technological changes or technological innovations themselves. As managerial responsibilities within organizations increase, the risk of technostress becoming more prevalent also rises. From this perspective, the technostress viewpoint in management can offer a top-down perspective of the organization. The necessity for employees to use technological innovations in organizational activities may cause stress, pressure, or discomfort. This is because the obligations created by technological innovations may lead to costly outcomes in terms of changing habits. In this regard, organizations' management mechanisms have important roles in making technological changes enjoyable and attractive for the entire organization. The study on technostress in management highlights potential technostress creators and what can be done to prevent this stress.

### 3.2. Research Problem and Framework

In today's world, technological changes are advancing rapidly. This situation deeply affects all organizations, especially managers. Organizations that fail to adapt to technological innovations often face serious harm to their continuity. In organizations, labor costs, technical failures, and resource shortages make technological change a necessity. This shows that adapting to technological changes and developments is extremely valuable. In this regard, the main problem of the study clarifies the relationship between the management mechanism and technostress. Technostress has serious effects on individuals' lives in many different areas. This makes it necessary to identify the workplace activities that cause technostress. In this sense, the framework of technostress research in management is as follows:

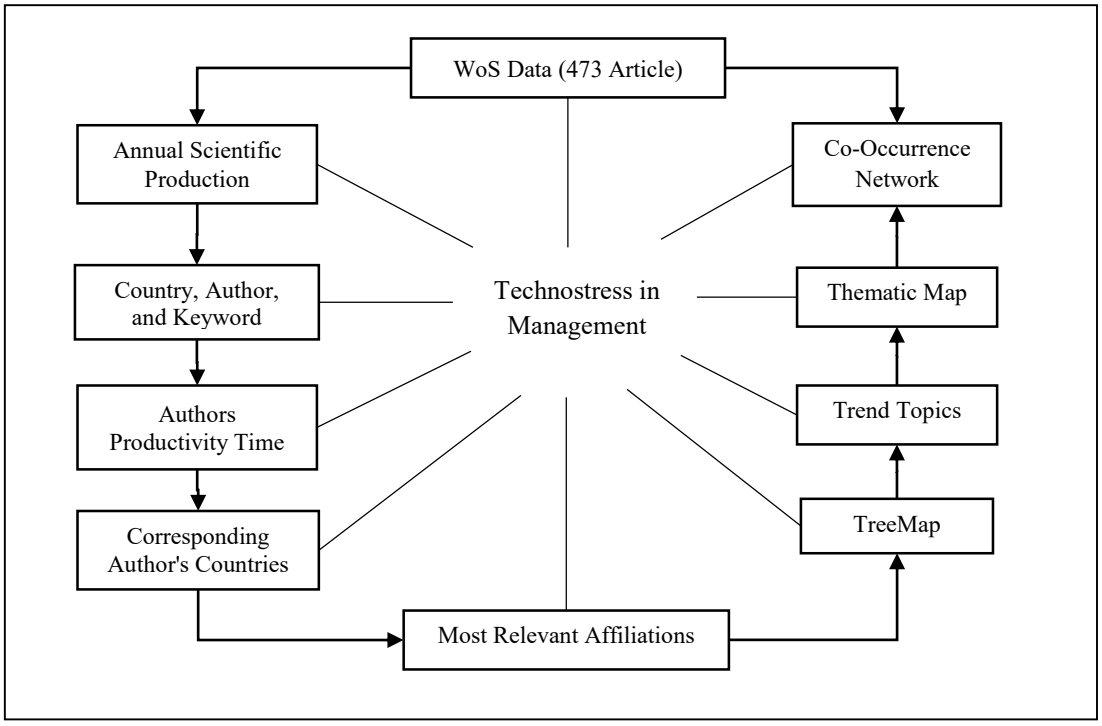


**Figure 1.** Research framework

Within the overall framework of the study, the focus has been placed on articles related to technostress in management included in the WoS literature, particularly in terms of highlighted keywords, authorship, productivity, trending topics, and conceptual relationships. Studies related to the research problem in the literature have been reviewed, and relevant results have been presented. The productivity of technostress research in management over the years has been provided. Country, author, and keyword matches have been identified. The productivity timelines of authors who have conducted intensive research on the topic have been specified. The country addresses of the corresponding authors have been disclosed. The most relevant institutions researching technostress in management have been identified. Keywords frequently emphasized by authors in their research have been listed. The trend times, centrality, and intensity levels of the keywords highlighted by the authors in the studies, along with the formation networks (the strength of relationships between concepts), have been presented. As a result of the study, the relationships, popularity, and time-dependent changes of the keywords emphasized by the authors in technostress research in management have been generally interpreted.

## 4. Results

The research addresses articles obtained from technostress studies in management in WoS on 15.11.2024. No categorical restrictions were applied other than the articles in the study. The general findings of the research are presented in Table 1. The research application results were presented using bibliometric analysis with the R program infrastructure.

**Table 1.** Technostress research in management based on WoS studies results

| Timespan | Sources | Documents | Annual growth rate |
|---|---|---|---|
| 1997:2025 | 214 | 473 | 0 % |
| Authors | Authors of single-authored docs | International co-authorship | Co-authors per doc |
| 1229 | 31 | 34.04 % | 3.26 |
| Author’s keywords | References | Document average age | Average citations per doc |
| 1726 | 24753 | 2.87 | 34.2 |

**Source:** Bibliometrix website (2024) / Own research

As a result of the analysis of Table 1, it has been observed that technostress articles in management have been researched between 1997 and 2025. This indicates that the concept of technostress is quite current and has started to appear in the literature due to technological developments and changes. In practice, it was found that there are 473 technostress articles in management, published in 214 different sources. The annual growth rate was found to be 0%, indicating a significant need for research on technostress in management. It was observed that 1229 authors have written technostress articles in management, with 31 single-author articles. The international co-author rate for technostress articles in management was found to be 34.04%, and the average number of co-authors per article was 3.26. The number of keywords used by the authors in their articles was 1726, and the number of references was 24753. It was found that the average publication year of the technostress articles in management is 2.87, and the average citation count per article is at a significant level of 34.2.

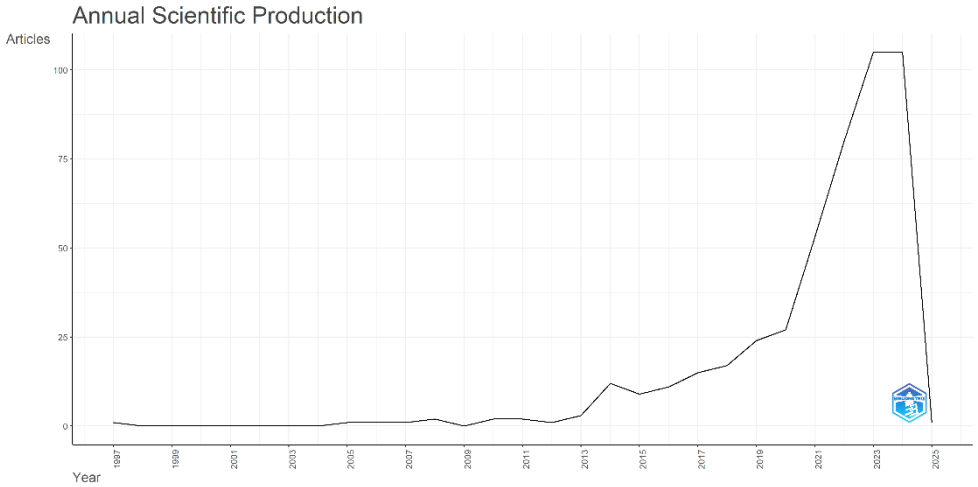


**Figure 2.** Annual scientific output on technostress in the field of management

It has been observed in Figure 2 that technostress research in management followed a generally horizontal trend between 1997 and 2013. After 2013, it was found that technostress research in management has been intensively studied. The study indicates that technostress research in management reached its maximum level in the years 2023 and 2024. Since the research was conducted on 15.11.2024, it is anticipated that future research on the topic will increase even further.

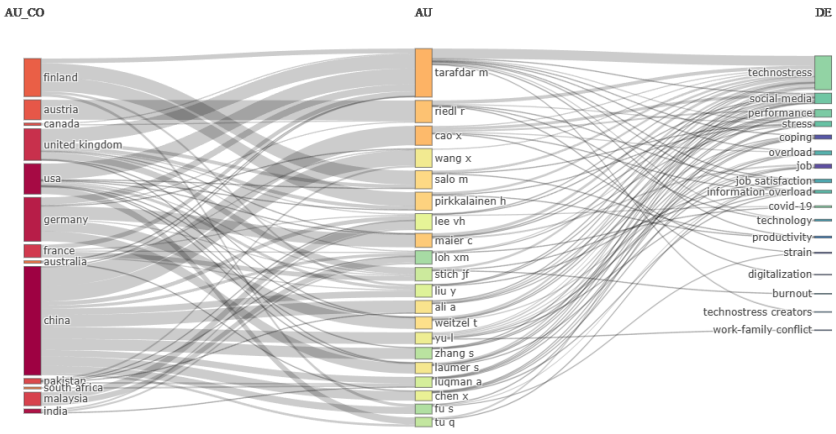


**Figure 3.** A comparative analysis of technostress research in management: Countries, authors, and keywords

In Figure 3 of the study, the authors who have conducted intensive research on technostress in management, the country affiliations of the authors, and the most frequently used keywords in their articles are presented. The analysis results show that the authors who have conducted the most research on technostress in management are listed as Tarafdar M., Riedl R., Cao X., Wang X., Salo M., Pirkkalainen H., Lee V.H., Maier C., Loh X.M., Stich J.F., Liu Y., Ali A., Weitzel T., Yu L., Zhang S., Laumer S., Lugman A., Chen X., Fu S., Tu Q. When examining the authors' country affiliations, they are found to be Finland, Austria, Canada, United Kingdom, USA, Germany, France, Australia, China, Pakistan, South Africa, Malaysia, and India. The most frequently used keywords in the authors' research are technostress, social media, performance, stress, coping, overload, job, job satisfaction, information overload, Covid-19, technology, productivity, strain, digitalization, burnout, technostress creators, and work-family conflict. The study includes the authors' country affiliations and keyword matches in their research. For example, Cao X. is an author affiliated with China and frequently uses keywords such as technostress and social media in their research.

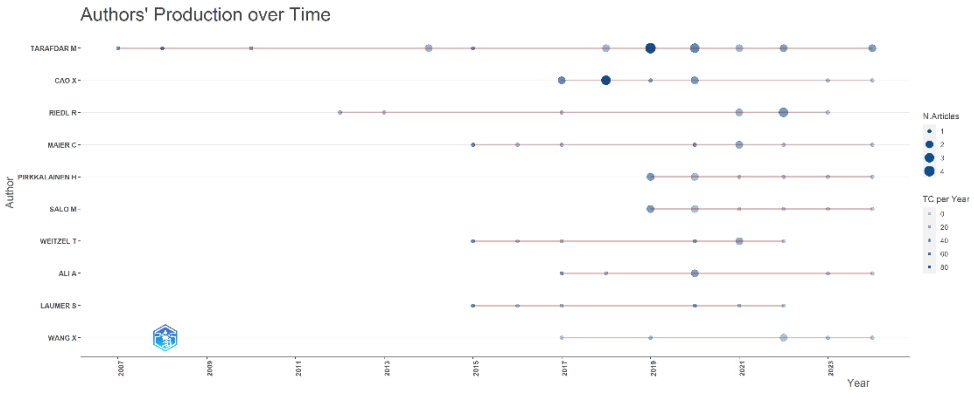


**Figure 4.** Authors' productivity time in technostress research in management

In Figure 4, the productivity timelines of authors who have conducted intensive research on technostress in management are presented. The figure shows that Tarafdar M. is at the top of the list of authors who have conducted extensive research on technostress in management, with intensive research conducted between 2007 and 2024. The years 2019 and 2020 were the peak years for the number of publications by this author (Tarafdar M.). The analysis shows that Cao X., Ali A., and Wang X. conducted intensive research on technostress in management between 2017 and 2024. The study also reveals that Riedl R. conducted extensive research from 2012 to 2023. In practice, Maier C. is seen to have conducted intensive research from 2015 to 2024. The analysis further indicates that Pirkkalainen H. and Salo M. have been actively involved in research on technostress in management from 2019 to 2024. Additionally, the study shows that Weitzel T. and Laumer S. researched technostress in management between 2015 and 2022.

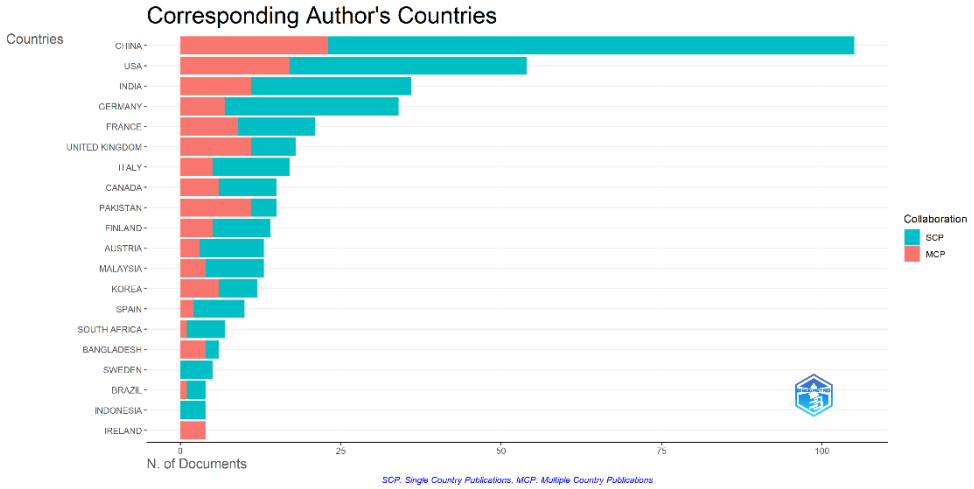


**Figure 5.** The country of the corresponding author as an indicator of research activity on technostress in management

In Figure 5, the country addresses of corresponding authors who have conducted intensive research on technostress in management are presented. The analysis includes single-country publications (SCP) and multiple-country publications (MCP). As a result of the analysis, it is observed that the country addresses of authors who have carried out extensive research on technostress in management are, in order China, USA, India, Germany, France, United Kingdom, Italy, Canada, Pakistan, Finland, Austria, Malaysia, Korea, Spain, South Africa, Bangladesh, Sweden, Brazil, Indonesia, and Ireland. The research findings indicate that China is where technostress studies in management have been most intensively conducted, both in single-country and multiple-country publications. In publications from Sweden and Indonesia, it was observed that the authors only had single-country publications. Ireland was found to be the country where authors had publications with multiple country addresses only. The figure also shows that, among the Central European countries, Germany and Austria have been actively involved in intensive research on technostress in management.

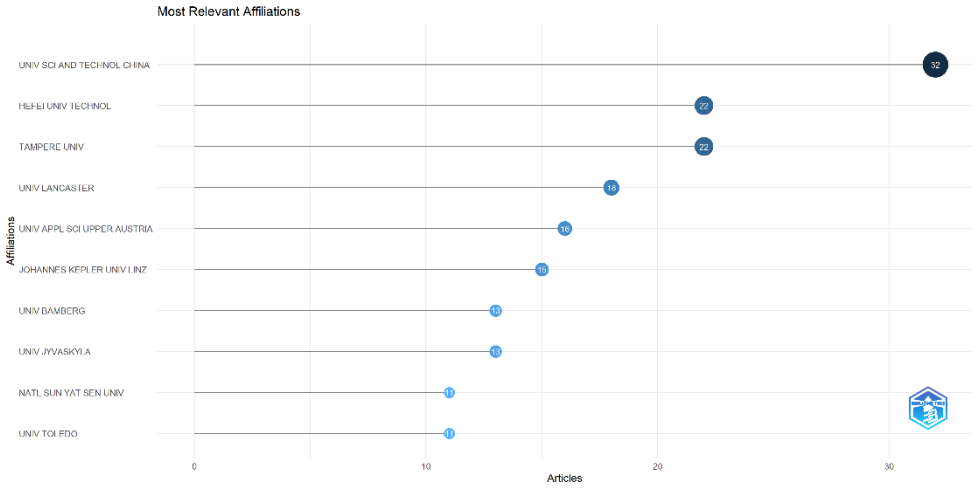


**Figure 6.** Most relevant affiliations in management technostress research

Figure 6 presents the most relevant affiliations that have conducted intensive research on technostress in management. The analysis indicates that the affiliations conducting extensive research on technostress articles are the University of Science and Technology of China, Hefei University of Technology, Tampere Universities, Lancaster University, University of Applied Sciences Upper Austria, Johannes Kepler University Linz, University of Bamberg, University of Jyväskylä, National Sun Yat-sen University, and University of Toledo. The results show that universities in China have conducted intensive research on technostress in management.

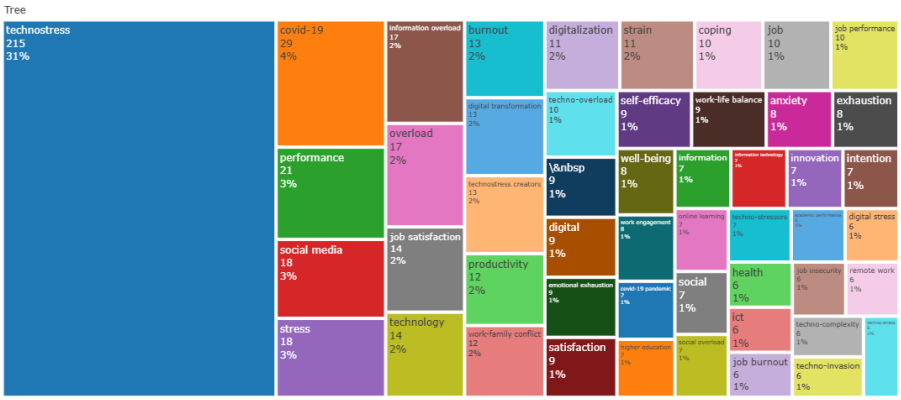


**Figure 7.** TreeMap of keywords most emphasized by authors in management technostress research

Figure 7 presents the most frequently emphasized words by authors in technostress research in management. The analysis reveals that authors most frequently (31%) emphasized the concept of technostress. Other words frequently emphasized about the topic include, covid-19, performance, social media, stress, information overload, overload, job satisfaction, technology, burnout, digital transformation, technostress creators, productivity, work-family conflict, digitalization, strain, coping, job, job performance, techno-overload, nbsp, digital, emotional exhaustion, satisfaction, self-efficacy, work-life balance, anxiety, exhaustion, well-being, work engagement, covid-19 pandemic, higher education, information, information technology, innovation, intention, online learning, social, social overload, techno-stressors, academic performance, digital stress, health, ICT (information and communication technologies), job burnout, job insecurity, remote work, techno-complexity, techno-invasion, and techno-stress. Overall, the results highlight that the concept of technostress has a significant impact on organizations. Technostress influences various factors such as employee performance, burnout, digital transformation processes, productivity, anxiety, and other related aspects.

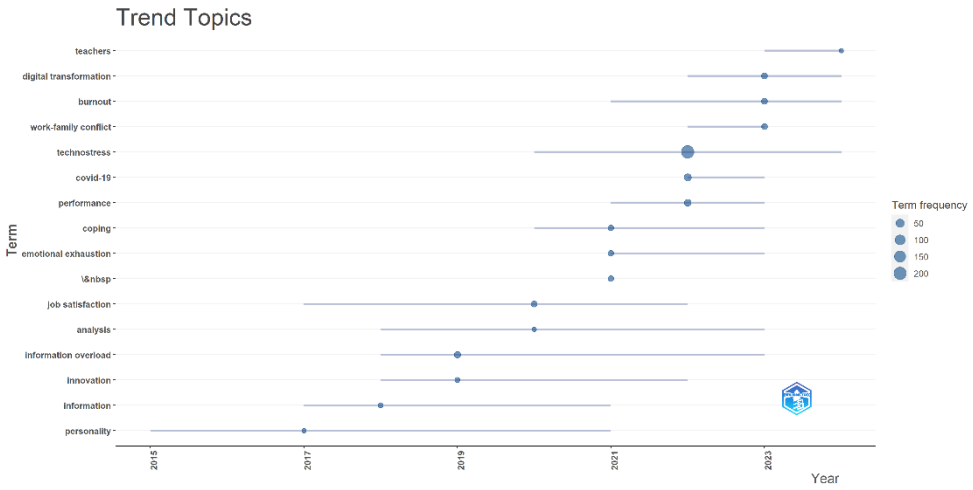


**Figure 8.** Times when the concepts emphasized by the authors became trending

Figure 8 presents the periods when the keywords emphasized by authors in technostress research in management became trends. The analysis shows that the term 'teachers' was popular in 2023-2024. The concept of 'digital transformation' was emphasized between 2022 and 2024. Authors frequently used the term 'burnout' between 2021 and 2024. The concept of 'work-family conflict' was highlighted in 2022-2023. The term 'technostress' was notably popular between 2020 and 2024, with significant attention in 2022. The term 'Covid-19' was frequently used in 2022-2023. The authors emphasized the term 'performance' in 2021-2023. The concept of 'coping' was used extensively between 2020 and 2023. The authors highlighted the term 'emotional exhaustion' in 2021-2023. The term 'nbsp' was used in 2021. The authors emphasized 'job satisfaction' between 2017 and 2022. The terms 'analysis' and 'information overload' were frequently highlighted between 2018 and 2023. The results show that the concept of 'innovation' was quite popular between 2018 and 2022. The authors emphasized the term 'information' between 2017 and 2021. The concept of 'personality' was frequently used between 2015 and 2021. The results demonstrate the periods when the keywords highlighted by authors in technostress research in management became popular. It is clear that in recent years, the concepts of 'technostress,' 'burnout,' 'digital transformation,' and 'teachers' have gained significant popularity in technostress research in management.

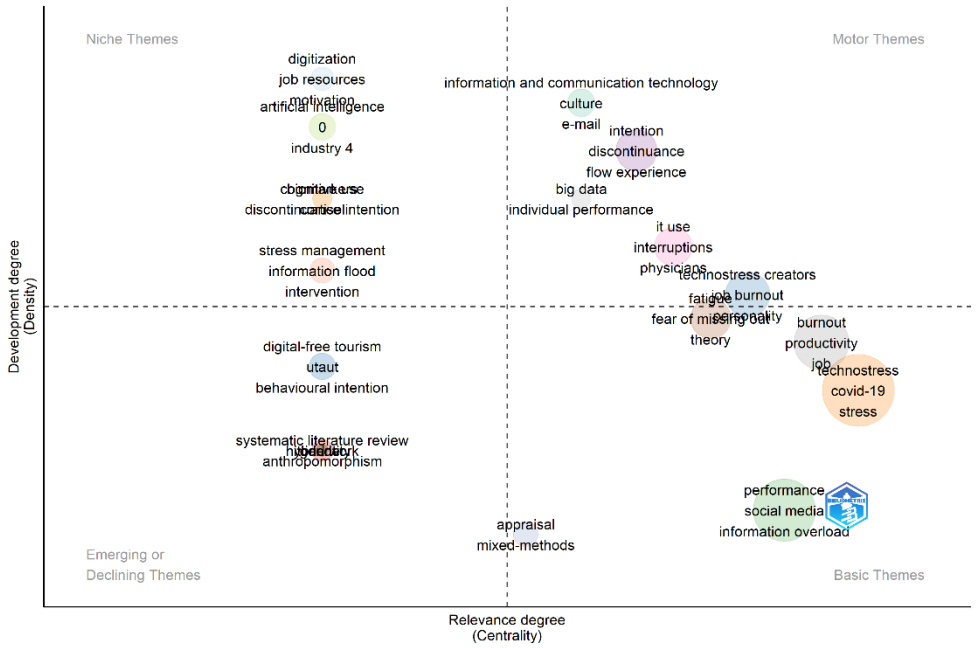


**Figure 9.** A thematic map of technostress research in management concerning centrality and density metrics

Figure 9 examines the centrality and density levels of the keywords emphasized by authors in technostress research in management, grouped accordingly. In the upper-right section of the figure, the motor themes represent keywords with high centrality and density, reflecting strong interrelations between concepts. In the upper-left section, niche themes consist of concepts with high density but low centrality. In the lower-left section, lost or newly emerging themes are represented, with both low centrality and density. In the lower-right section, core themes are shown, with high centrality but low density (Cobo et al., 2015). Within each group, the keywords emphasized by authors have strong interrelationships. Especially in the motor themes section, the high centrality and density levels of the emphasized keywords suggest that these are the most influential concepts in technostress research in management.

In technostress research in management, the first group of motor themes with high centrality and density includes the following concepts technostress creators, job burnout, personality, technostress inhibitors, organizational commitment, personality traits, compliance intention, compulsive usage, eustress, and job engagement. These concepts represent the strongest relationships on the thematic map. Overall, they represent the formations and relationships related to work activities in organizations. The second group of motor themes in the research includes the terms, intention, discontinuance, flow experience, frustration, technology adoption, adoption, artificial intelligence (AI), ChatGPT, China, and continuance. These terms highlight the importance of technological innovations and changes in technostress research in management. The third group of motor themes includes, IT use, interruptions, physicians, technology acceptance, addiction, age, dark side, information load, longitudinal study, and mobile. The fourth group of motor themes consists of information and communication technology, culture, e-mail, and experience sampling. The fifth group of motor themes includes big data and individual performance.

In technostress research in management, the first group of niche themes with high density and low centrality includes the terms artificial intelligence, 0, and industry. The second group of niche themes consists of the concepts of stress management, information flood, and intervention. The third group of niche themes includes digitization, job resources, and motivation. The fourth group of niche themes consists of biomarkers and cortisol.

The first group of lost or newly emerging themes with low density and centrality includes the concepts of digital-free tourism, UTAUT, and behavioral intention. The second group includes the terms systematic literature review and anthropomorphism. The third group consists of the concept of IT identity.

Technostress research in management has a high degree of centralization and low intensity in the first group of fundamental themes, which includes the concepts of technostress, Covid-19, stress, job satisfaction, technology, digital transformation, work-family conflict, digitalization, strain, and coping. These concepts have been widely used by authors. The second group includes terms such as performance, social media, information overload, overload, job performance, emotional exhaustion, exhaustion, information, social, and social overload. The third group of fundamental themes consists of burnout, productivity, job, techno-overload, work engagement, techno-

stressors, techno-complexity, techno-invasion, techno-stress, and mindfulness. The fourth group contains concepts like fatigue, fear of missing out, theory, work overload, affordances, autonomy, privacy, computer anxiety, conservation of resource theory, and fuzzy-set qualitative comparative analysis (fsqca). The fifth group of fundamental themes consists of the terms appraisal and mixed-methods.

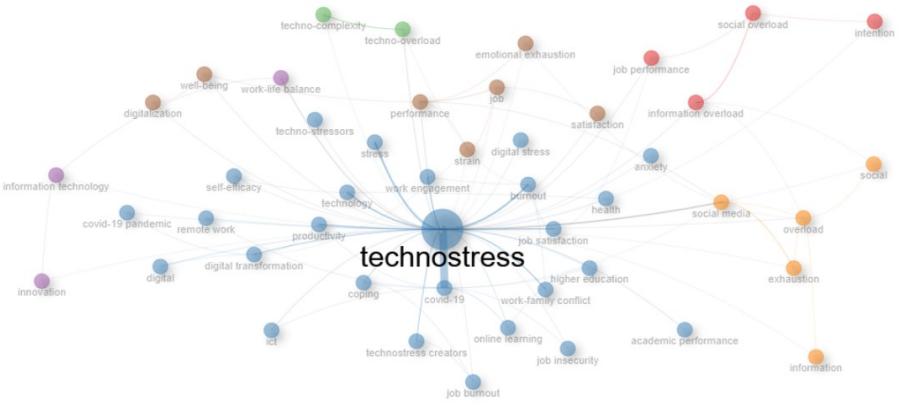


**Figure 10.** Co-occurrence network analysis of technostress research in the field of management

Figure 10 presents the co-occurrence network of keywords emphasized by authors in technostress research in management. The analysis revealed that technostress has strong relationships with many concepts. As a result, it was observed that technostress has strong co-occurrence networks with concepts such as Covid-19, burnout, productivity, stress, work-family conflict, job satisfaction, work engagement, technology, coping, higher education, digital transformation, work-life balance, techno-stressors, digital stress, anxiety, health, academic performance, online learning, technostress creators, ICT (information and communication technologies), job burnout, digital, innovation, information technology, Covid-19 pandemic, remote work, and self-efficacy. Furthermore, strong relationships were found between technostress and concepts like social media, exhaustion, information, overload, social, intention, job performance, information overload, satisfaction, job, emotional exhaustion, strain, performance, techno-overload, techno-complexity, well-being, and digitalization. In terms of co-occurrence networks, social media, overload, social, exhaustion, and information were found to be related. Additionally, job performance, social overload, intention, information overload, satisfaction, job, performance, strain, and emotional exhaustion formed co-occurrence networks. The study also showed that the concepts of techno-overload and techno-complexity have strong relationships. Moreover, digitalization and well-being also formed co-occurrence networks. The results indicate that many concepts are associated with technostress in management. Specifically, it shows that many variables affecting employees' (whether subordinates or superiors) work activities play a role in the formation of technostress or its relationships in management.

## 5. Discussion

The study indicates that technostress has a significant impact on organizational activities. It was observed that many variables can cause technostress in employees. It was emphasized that in addition to physical interventions, emotional and psychological motivational factors should be considered to reduce technostress in employees, starting with the management mechanism. It was also found that the sources of technostress in individuals are not only related to activities within the organization, but also external factors (such as Covid-19) can be an effective source of stress. In managing technostress, it was understood that the decisions of managers regarding the future and their policies for implementation are highly effective. It was emphasized that managers must take certain measures to prevent technostress both at the individual and organizational levels.

In practice, it has been observed that the concept of organizational commitment has strong relationships with technostress in terms of centrality and intensity. The study also shows that the concepts of job satisfaction and satisfaction are frequently emphasized by the authors. The analysis revealed that the concepts of productivity and anxiety are also frequently highlighted by the authors as being related to technostress. These concepts are generally of vital importance for employees and the management mechanism within organizations, and they play a significant role in the formation of work activities and organizational outcomes. Selye (1974, cited in Caro et al., 1985) stated that technostress has individual and organizational consequences. He emphasized that technostress

leads to anxiety, low productivity, interpersonal conflicts, job dissatisfaction, depression, decision-making difficulties, absenteeism, and a decrease in organizational commitment and loyalty. Atanasoff and Venable (2017) expressed that technostress in organizations can be a source of tension and anxiety.

The study shows that the concepts of techno-overload, techno-complexity, techno-invasion, techno-stress, information technology, and information and communication technologies (ICT) are frequently highlighted by the authors as having strong relationships with technostress. Tarafdar et al. (2007) found that technostress has positive effects on techno-overload, techno-complexity, and techno-invasion. They noted that managers should use certain management mechanisms to reduce technostress. They also pointed out a negative relationship between technostress and employee productivity, and that training on the use of information and communication technologies could help reduce technostress. Riedl (2013) emphasized that the primary goal of information technology is to make technology user-friendly. Bondanini et al. (2020) stressed that the concept of techno-invasion represents the constant connections invading life, techno-overload represents simultaneous increases in speed with different flows of information, and techno-complexity represents ICT complexity that creates a sense of inadequacy due to difficulty in understanding. They noted that teamwork, user training, manuals, and knowledge sharing are factors that can help prevent technostress. Bencsik and Csinger (2021) pointed out that in higher education, developments in information and communication technologies have an impact on techno-overload, techno-complexity, and techno-invasion. They also showed that techno-complexity affects techno-uncertainty, and techno-insecurity affects the concept of techno-invasion. They emphasized that the constant changes in software and computer network upgrades due to technological developments influence techno-complexity and techno-uncertainty. Pirkkalainen, Tarafdar, Salo and Makkonen (2022) mentioned that employees in a competitive environment may experience insecurity when using information technologies. Leitner and Rašticová (2023) emphasized that through training programs for employees in organizations, the creation of psychological and technological knowledge sources could reduce the effects of the concepts of techno-overload, techno-complexity, and techno-invasion. Ioannou et al. (2024) found that awareness of information technologies reduces the negative impact of technostress on user satisfaction. They highlighted that awareness training programs could be effective in coping with technostress factors such as techno-overload, techno-invasion, techno-uncertainty, techno-insecurity, and techno-complexity Kırıcı and Yılmaz (2025) state that stress is high among those working in the field of information technologies.

In technostress research in management, it is observed that technostress is highly influential at the organizational level. The presence of inexperienced technological innovations within employees' workloads can be an effective stress factor. The organization's area of activity plays a leading role in the formation of technostress. In this regard, Wang et al. (2008) found that in organizations with low centralization/low innovation, employees experience the lowest levels of technostress. In their research, they also discovered that in organizations with high centralization/high innovation, employees have the highest levels of technostress. They emphasized that these organizations are dependent on technological innovations to gain a competitive advantage.

It has been observed that the concept of innovation is frequently emphasized by authors, that it was popular between 2018 and 2022, and that it has relationships with technostress in the co-occurrence network. The concept of stress management was found to be part of the niche themes in the study. Additionally, the concept of job insecurity was also observed as one of the key terms emphasized by the authors. Wang et al. (2008) found that employees in innovative organizations with centralized power have high levels of technostress. They emphasized that managers should ensure a positive stress threshold by reducing their employees' stress related to technology and psychological anxieties. Florkowski (2019) revealed that technostress has a negative relationship with governance participation, human resources innovation climate, and senior management support. He noted that technostress has a positive relationship with insecurity. Kim and Lee (2021) mentioned that organizations encourage innovation through new technologies to increase their competitiveness. They emphasized that this leads to innovation resistance in terms of privacy violations, workload, and uncertainties in job satisfaction. They suggested that organizations need to develop new devices to reduce the harmful effects of new technologies.

In practice, it has been observed that the concepts of emotional exhaustion, exhaustion, and job satisfaction have strong relationships with technostress and are frequently used by the authors. In organizations, exhaustion can affect employees' motivation towards their work and future goals. Especially when the workload is high, it may contribute to employees feeling uncomfortable at work, which can increase the feeling of exhaustion. The lack of development in employees' job satisfaction feelings may support the formation of technostress. Technological innovations may have strong relationships with feelings of exhaustion and satisfaction. Employees with high job satisfaction levels experience lower levels of stress. However, in work environments where employees are not accustomed to technological innovations, the stress factor may be more dominant or effective. Ayyagari et al. (2011) state that in organizations, exhaustion has a greater impact on technostress than job satisfaction.

In technostress research in management, the concept of technology has been observed to be frequently used as a keyword, emphasized among key concepts, and included in fundamental themes within the co-occurrence network.

The concept of technology adoption has also been observed to appear in the motor themes section, with high centrality and intensity. Technology has increasingly shaped individuals' activities across various fields (such as industry, transportation, healthcare, agriculture, and service sectors). It has changed employment and decision-making policies in many areas. Suharti and Susanto (2014) emphasized that the rapid use of production technologies without preparing employees causes technostress. They also noted that excessive workload during technological changes increases technostress. Mahboob and Khan (2016) stated that excessive use of technology and working hours in the workplace increases employees' stress. They pointed out that this situation raises organizational costs and reduces productivity. Sanjaya et al. (2018) found that employees in organizations who have a good working environment and new rights are more able to adapt to new technological developments and experience reduced stress. With this result, they stated that socially responsible human resource management has an impact on technostress creators. Ewers and Kangmennaang (2023) linked individuals' success to their ability to adapt to dynamic technological changes and remain resilient.

The stress individuals experience in their work activities, to a certain extent, can contribute to their performance or productivity. Particularly, the level of stress they can control, along with their responsibilities, can lead to positive outcomes. In the study, it was observed that the concept of eustress has very high centrality and intensity in the motor themes section. This concept was emphasized by Salo et al. (2018), who highlighted that technostress creates positive emotional experiences in individuals. Salazar-Concha et al. (2021) emphasized that the concept of techno-eustress has characteristics such as satisfaction, vitality, joy, not creating imbalance, and assisting in decision-making processes. They also stated that it helps individuals improve their skills.

In the analysis, it was observed that the concept of social media is frequently emphasized by the authors, and there are relationships between technostress and social media. Social media has become a platform that individuals actively use, even in organizational activities, to share content. Many organizations announce their activities on their social media accounts. Employees' personal social media accounts can cause disruptions in organizational activities. Social media leads employees to waste time, reduces productivity, and causes interruptions in workplace activities. Cao and Yu (2019) state that excessive use of social media can affect technological conflict at work, leading to tension and decreased job performance.

In the study, it was observed that the concepts of performance, job performance, and academic performance are frequently emphasized by the authors and have strong relationships with technostress. In the examination of technostress in management, it was observed that the concept of individual performance also has strong relationships in terms of centrality and intensity. In organizations, performance plays a significant role in contributing to the continuity of both employees and the organization. Taking measures to improve individuals' performance is one of the primary tasks of the management mechanism. In this regard, controlling technostress in organizations helps prevent a decline in employee performance. Maier, Laumer, Wirth and Weitzel (2019) stated that high or low perceptions of technostress result in poor performance. They emphasized that when technostress factors are at moderate levels, they lead to improvements in employee performance. Wang and Li (2019) found that technostress negatively affects employees' (academics') job performance. Çini, Erdirençelebi and Akman (2023) revealed that employees' levels of technostress affect their performance. They stated that factors such as complexity, workload, and uncertainties are influential within the technostress framework. They also emphasized that motivation, satisfaction, speed, quality, continuity, and imbalances in work life have an impact on employee performance.

In the examination of technostress in management, it was observed that the concepts of social and social overload have strong relationships with technostress and are frequently emphasized by the authors. Especially in organizations, strong social relationships can help employees maintain a balance in their technostress. The social structure of organizations contributes to the development of both employee and superior-subordinate relationships. Okolo et al. (2019) emphasized that social relationships can be facilitated when the management mechanism provides social support to employees, and autonomous work groups can be formed to improve feedback. They also noted that interactions and task dependencies outside of work can reduce the effects of technostress.

In the study, it was observed that Covid-19 is a highly influential concept in the examination of technostress in management. It was found that Covid-19 was frequently used in 2022-2023 and was associated with technostress. With the widespread implementation of remote education in many fields, there was an increased need for technological resources. This situation led to technostress among individuals. During the Covid-19 period, people were forced to carry out many activities from home. This especially led to the frequent use of technological products in closed environments. As people's social interaction spaces were limited, stress factors emerged in individuals. The limited social relationships between people became a source of stress. Zeeshan, Chaudhry and Khan (2020) stated that during the Covid-19 pandemic period, it was effective not only for the management mechanism and other employees to provide administrative directives but also services such as counseling. They also emphasized that having working hours learned online and organized systematically would help individuals stay healthy both mentally and psychologically and would not cause technostress. Khedhaouria, Montani, Jamal

and Shah (2024) highlighted that during crisis periods like Covid-19, remote working information and communication technology users' satisfaction decreased, which led to technostress. In their analysis, they found that emotional social support reduced the tension caused by technostress and increased job satisfaction.

The analysis results show that the concepts of digital, digitalization, digital transformation, and digital stress have strong relationships with technostress and are frequently emphasized by the authors. Digital applications, driven by technological developments, have influenced organizational management and employees. Technological advancements have expanded the scope of digital applications. Employees have carried out many activities with the help of digital applications. Digital activities have played an important role in employees' lives. Dragano and Lunau (2020) stated that digital transformations affect employees' psychosocial work environments. They emphasized that while digitalization can have negative consequences in terms of technostress, digital tools, and technologies can also have positive effects that reduce stress. Riedl, Fischer and Reuter (2023) mentioned that digital stress has spread due to advancements in information and communication technologies, and its importance has been growing day by day worldwide.

The study found that the concept of self-efficacy is frequently emphasized by the authors and has strong relationships with technostress. When individuals have high self-efficacy, particularly in terms of interest in technological products, it allows the stress factor to remain at lower levels. Technological resources that support individual abilities have contributed to employees' self-efficacy. On the other hand, if technological resources hinder individual abilities or prevent their development, they create a significant source of stress. Kim and Lee (2021) stated that organizations can provide training in information technology to enhance individual competence and self-efficacy. They emphasized that self-efficacy in the organization can reduce technology insecurity and excessive workload, and by creating technical support for new technologies, technological uncertainty can be eliminated.

The study observed that the concepts of personality and personality traits are related to technostress and are frequently used by the authors. The personality traits of managers or employees in an organization have had an impact on the formation of technostress. Individuals' characteristics have influenced superior-subordinate relationships and technology adaptation. In practice, it was also observed that the concept of job engagement is related to technostress. Technological resources in organizations have played a role in employees' engagement with their work activities. Bhatt and Kothari (2022) found that the personality traits of individuals in an organization are a determinant of technostress. They also stated that individuals' level of technology involvement and organizational climate are important determinants of technostress.

The analysis observed that the concepts of information and communication technology, culture, e-mail, and experience sampling have strong relationships in terms of centrality and density. The rapid changes in information and communication technologies have altered individuals' habits, experiences, and, overall, the cultural structure of organizations. Day by day, many organizations' activities have changed in terms of information and communication technologies. Bencsik and Juhász (2023) found that organizational employees rely more on interpersonal interactions than on technology. They stated that they do not trust the outputs provided by technologies that are used poorly or of low quality. Martínez-Navalon et al. (2023) emphasized that organizations need to invest in management software that facilitates the adaptation of new information and communication technologies to overcome technostress.

The analysis revealed that the concept of higher education was frequently emphasized by the authors and has strong relationships with technostress. Education has significantly contributed to individuals' abilities and technological achievements in many activities. In this case, it is anticipated that the development and implementation of technical educational opportunities would reduce technostress. Training provided in digital environments has also been an effective source of stress. Resistance to technological innovations has supported the formation of stress elements. Bencsik and Csinger (2021) concluded that the coercive effects of technology in higher education influence the complexity of understanding new technologies. Duggal, Khatri, Thomas and Pironti (2024) emphasized that online education provides important opportunities for professional learning, and to take advantage of these opportunities, technostress must be managed. In this regard, they noted that learning outcomes in digital environments can be improved and that quality interactions can help balance the effects of technostress.

The study observed that the concept of work engagement was frequently emphasized by the authors, has strong relationships with technostress, and is present in the core themes. Work engagement has influenced employees' organizational activities. It has been effective in helping employees adapt to their work and internalize their tasks. Rodriguez, Verdu-Jover, Estrada-Cruz and Gomez-Gras (2024) revealed that work engagement mediates the impact of technostress on employees' productivity perceptions. They emphasized that employees who are committed to and feel dedicated to their work can transform digital transformation into an easier and more productive experience.

In the study of technostress in management, it is observed that the concept of artificial intelligence (AI) has strong relationships in both core themes and niche themes in terms of centrality and density. The concept of information and communication technologies (ICT) also shows relationships in technostress research in management. It is understood that digitalization is frequently used by the authors and shows strong relationships. Artificial intelligence, with the help of technology and digital tools, provides many conveniences for employees and managers in organizational activities. Rapid developments in information and communication technologies (ICTs) provide conveniences for many employees, particularly managers, in terms of work activities. Digital transformations in organizations can lead to technostress in individuals. Irfan, Sulehri and Manickiam (2024) emphasize that the integration of artificial intelligence (AI), information and communication technologies (ICTs), and the Internet of Things (IoT) is a transformation of digitized corporate activities. They note that this situation allows organizations to redesign their business processes and become compatible with smart and evolving digital activities. As a result, they emphasize that digitalization creates challenges such as technostress.

In technostress studies in management, it has been understood that there are many behavioral outcomes both within and outside the organization that are related to technostress. From a practical research perspective, technostress in management is associated with resistance to technological change or transformation. This resistance can be displayed either by the individuals themselves or toward the organization. While technological changes can create an enjoyable and efficient environment for some employees, they may cause stress for others. Adapting technological innovations to business activities can provide savings in terms of time and capacity usage. However, it may lead to stress, inefficiency, and anxiety for some employees.

It is understood that technostress, as a whole, affects organizational activities in management. It is anticipated that technostress should be taken into account in the relationships between employees, managers, and the organization. It is considered important for managers to first adapt themselves to technological changes, and then be able to help other employees adapt. It is emphasized that technostress can affect the activities of employees at all levels, and should be considered both from an individual and group perspective. It is stated that digital transformations and changes are integrated with technology. In this regard, it is suggested that organizations should implement policies that embrace and adapt to technological changes, rather than resist technology.

## 6. Conclusion

Today, many activities in organizations can be carried out using digital and technological innovations. This affects the operational activities of the management mechanism. Technological changes enable organizations to use smart technologies such as smartphones, tablets, computers, new software, artificial intelligence or applications, virtual reality, blockchain, cloud computing, facial recognition systems, and 3D printers in their business activities. These innovations are some of the factors that lead to the formation of technostress among employees. To prevent the formation of such stress, organizations must first review their policies and reduce factors that may cause stress in the work environment.

As a result of the analysis, the most important concepts strongly related to technostress are listed as follows, Covid-19, burnout, productivity, stress, work-family conflict, job satisfaction, work engagement, technology, coping, higher education, digital transformation, work-life balance, techno-stressors, digital stress, anxiety, health, academic performance, online learning, technostress creators, information and communication technologies, job burnout, digital, innovation, information technology, covid-19 pandemic, remote work, and self-efficacy. Additionally, in terms of centrality and density, the following concepts have strong relationships with technostress, technostress creators, job burnout, personality, technostress inhibitors, organizational commitment, personality traits, compliance intention, compulsive usage, eustress, and job engagement. Overall, it has been understood that technostress is related to many factors both inside and outside the organization.

Technostress in management can be a result of resistance to technological change or transformation. This resistance can be an attitude exhibited by the individual or the organization itself. While technological changes may create an enjoyable and productive environment for some employees, for others, it may become a source of stress. Adapting technological innovations to business activities can provide savings in terms of time and capacity usage. However, this may lead to stress, inefficiency, and anxiety for some employees. Implementing technological and digital transformations after they have been experienced by employees may result in healthier outcomes. Particularly for individuals who enjoy technology and can apply technological innovations to their lives (for those who have access to and use such resources), the stress factor may be at lower levels. For example, for employees whose activities are effectively carried out with smartphone applications (such as QR apps), work activities may resemble everyday tasks like shopping.

The research suggests several recommendations for organizational management to control technostress. Technostress should be regarded as natural in today's work conditions. Timely technical knowledge flow and

employee training within organizations can reduce the perception of technostress. Motivational applications can be implemented in training programs to enhance employees' technological adaptation. Technical support can be provided in the work environment. Stress-preventive measures, such as individual activities, can be implemented for employees. In decision-making related to technology use within the management mechanism, employees' opinions can be taken into account. In terms of employment policies, a long-term trust environment can be established for employees. Human relations can be valued within organizations. This can strengthen social relationships further. Educational programs can be provided to increase employees' technical knowledge.

The research analysis results are limited to 473 articles published in the WoS database in 2024. In the study, technostress in management has been evaluated from a holistic perspective. Especially due to the recent increase in technological innovations and stress factors, the relationships between the management mechanism and other employees have been emphasized. Future research may explore the anxiety caused by technological innovations in employees, their psycho-social expectations, and the effects of digital transformations. The levels of technostress formation among employees can be assessed based on factors such as age, education, and professional experience. Additionally, the impact levels of technological pressure, workplace environment, and management pressure on employees' adaptation to work can be investigated separately.

## Conflict of Interest

There is no conflict of interest. The article complies with the rules of research and publication ethics.

## References

Aria, M., & Cuccurullo, C. (2017). Bibliometrix: An R-tool for comprehensive science mapping analysis. *Journal of Informetrics*, 11(4), 959-975. http://dx.doi.org/10.1016/j.joi.2017.08.007

Atanasoff, L., & Venable, M.A. (2017). Technostress: Implications for adults in the workforce. *The Career Development Quarterly*, 65, 326-338. http://dx.doi.org/10.1002/cdq.12111

Ayyagari, R., Grover, V., & Purvis, R. (2011). Technostress: Technological antecedents and implications. *MIS Quarterly*, 35(4), 831-858. https://www.jstor.org/stable/41409963

Bencsik, A., & Csinger, B. (2021). Innovations in human resources management of higher education institutions: Technostress factors. *In: Marketing i menedžment innovacij*, (4), 55-67. https://doi.org/10.21272/mmi.2021.4-05

Bencsik, A., & Juhász, T. (2023). The impact of technostress on organizational functioning. *Problems and Perspectives in Management,* 21(1), 230-241. https://doi.org/10.21511/ppm.21(1).2023.20

Berger, M., Schäfer, R., Schmidt, M., Regal, C., & Gimpel, H. (2024). How to prevent technostress at the digital workplace: a Delphi study. *Journal of Business Economics*, 94, 1051–1113. https://doi.org/10.1007/s11573-023-01159-3

Bhatt, N., & Kothari, T.P. (2022). Determinants of technostress: A systematic literature review. *European Journal of Business Science and Technology*, 8(2), 159–171. https://doi.org/10.11118/ejobsat.2022.007

Bibliometrix website (2024). (https://www.bibliometrix.org/home/)

Bondanini, G., Giorgi, G., Ariza-Montes, A., Vega-Muñoz, A., & Andreucci-Annunziata, P. (2020). Technostress dark side of technology in the workplace: A scientometric analysis. *International Journal of Environmental Research and Public Health,* 17, 1-23. https://doi.org/10.3390/ijerph17218013

Cao, X., & Yu, L. (2019). Exploring the influence of excessive social media use at work: A threedimension usage perspective. *International Journal of Information Management*, 46, 83–92. https://doi.org/10.1016/j.ijinfomgt.2018.11.019

Caro, D.H.J., A., M.B., A., M.H., & 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

Cobo, M.J., Martinez, M.A., Gutierrez-Salcedo, M., Fujita, H., & Herrera-Viedma, E. (2015). 25 years at Knowledge-Based Systems: A bibliometric analysis. *Knowledge-Based Systems*, 80, 3–13. https://doi.org/10.1016/j.knosys.2014.12.035

Çini, M.A., Erdirençelebi M., & Akman A.Z. (2023). The effect of organization employees' perspective on digital transformation on their technostress levels and performance: A public institution example. *Central European Business Review*, 12(4), 33-57. https://doi.org/10.18267/j.cebr.331

Dragano, N., & Lunau, T. (2020). Technostress at work and mental health: concepts and research results. *Current Opinion in Psychiatry*, 33(4), 407-413. https://doi.org/10.1097/YCO.0000000000000613

Duggal, H.K., Khatri, P., Thomas, A., & Pironti, M. (2024). Changing learning paradigms: an interplay of Digital Taylorism and technostress on perceived employability. *Journal of Management History*, 30(2), 166-194. https://doi.org/10.1108/JMH-12-2022-0089

Ewers, M., & Kangmennaang, J. (2023). New spaces of inequality with the rise of remote work: Autonomy, technostress, and life disruption. *Applied Geography*, 152, 1-11. https://doi.org/10.1016/j.apgeog.2023.102888

Florkowski, G.W. (2019). HR technologies and HR-staff technostress: an unavoidable or combatable effect? *Employee Relations: The International Journal*, 41(5), 1120-1144. https://doi.org/10.1108/ER-08-2018-0214

Ioannou, A., Lycett, M., & Marshan, A. (2024). The role of mindfulness in mitigating the negative consequences of technostress. *Information Systems Frontiers*, 26, 523–549. https://doi.org/10.1007/s10796-021-10239-0

Irfan, M., Sulehri, N.A., & Manickiam, N. (2024). Digital threads in turbulent times: unraveling technostress and cleaner production in the food industry. *Frontiers in Robotics and AI*, 1-21. https://doi.org/10.3389/frobt.2023.1293904

Jaiswal, A., Sengupta, S., Panda, M., Hati, L., Prikshat, V., Patel, P., & Mohyuddin, S. (2024). Teleworking: Role of psychological well-being and technostress in the relationship between trust in management and employee performance. *International Journal of Manpower*, 45(1), 49-71. https://doi.org/10.1108/IJM-04-2022-0149

Khedhaouria, A., Montani, F., Jamal, A., & Shah, M.H. (2024). Consequences of technostress for users in remote (home) work contexts during a time of crisis: The buffering role of emotional social support. *Technological Forecasting & Social Change,* 199, 1-12. https://doi.org/10.1016/j.techfore.2023.123065

Kırıcı, S., & Yılmaz, I. (2025). Application of the nasa-tlx method for workload assessment of information technology employees in the remote working process: a case of defense industry. *Journal of Turkish Operations Management*, 9(1), 181-199. https://doi.org/10.56554/jtom.1470739

Kim, D.G., & Lee, C.W. (2021). Exploring the roles of self-efficacy and technical support in the relationship between techno-stress and counter-productivity. *Sustainability*, 13, 1-16. 4349. https://doi.org/10.3390/su13084349

Kumar, P.S. (2024). Technostress: A comprehensive literature review on dimensions, impacts, and management strategies. *Computers in Human Behavior Reports*, 16, 1-16. https://doi.org/10.1016/j.chbr.2024.100475

Leitner, I., & Liepert, M. (2024). Demographic and occupational determinants of technical overload, techno-intrusion and techno-complexity. *Scientific Studios on Social and Political Psychology*, 30(1), 46-56. https://doi.org/10.61727/sssppj/1.2024.46

Leitner, I., & Rašticová, M. (2023). Technostress and its management in the 21st century workplace: Implications for consulting workforce. *Polish Journal of Management Studies*, 27(2), 206-222.

Lim, J., & Hwang, J. (2024). Exploring knowledge management technologies to enhance sustainability and mitigate technostress from a collaborative perspective. *Journal of Knowledge Management*, 1-20. https://doi.org/10.1108/JKM-12-2023-1304

Mahboob, A., & Khan, T. (2016). Technostress and its management techniques: A literature review. *Journal of Human Resource Management*, 4(3), 28-31. https://doi.org/10.11648/j.jhrm.20160403.12

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

Martínez-Navalon, J.G., Gelashvili, V., Dematos, N., & Herrera-Enríquez, G. (2023). Exploring the impact of digital knowledge management on technostress and sustainability. *Journal of Knowledge Management,* 27(8), 2194-2216. https://doi.org/10.1108/JKM-07-2022-0544

Okolo, D., Kamarudin, S., & Ahmad, U.N.U. (2019). Employing the sociotechnical system theory of job design for technostress intervention: An integration of technological and social job characteristics. *Change Management: An International Journal*, 19(1), 11-23. https://doi.org/10.18848/2327-798X/CGP/v19i01/11-23

Passas, I. (2024). Bibliometric Analysis: The Main Steps. *Encyclopedia*, 4, 1014–1025. https://doi.org/10.3390/encyclopedia4020065

Pirkkalainen, H., Tarafdar, M., Salo, M., & Makkonen, M. (2022). Proximal and distal antecedents of problematic information technology use in organizations. *Internet Research,* 32(7), 139-168. https://doi.org/10.1108/INTR-02-2021-0083

Riedl, R. (2013). On the biology of technostress: Literature review and research Agenda. *The DATA BASE for Advances in Information Systems,* 44(1), 18-55.

Riedl, R., Fischer, T., & Reuter, M. (2023). Measuring digital stress in the workplace context: Short version of the Digital Stressors Scale (DSS). *Informatik Spektrum*, 46, 235–239. https://doi.org/10.1007/s00287-023-01553-9

Rodriguez, B.P., Verdu-Jover, A.J., Estrada-Cruz, M., & Gomez-Gras, J.M. (2024). Does digital transformation increase firms' productivity perception? The role of technostress and work engagement. *European Journal of Management and Business Economics,* 33(2), 137-156. https://doi.org/10.1108/EJMBE-06-2022-0177

Sanjaya, N., Do, B-R, Salim, U., & Moko, W. (2018). Influence socially responsible human resource management, technostress creators and employee satisfaction to use fintech (study on Financial Institutions in Indonesia). *Asia-Pacific Management and Business Application*, 7(2) 81-94. https://doi.org/10.21776/ub.apmba.2018.007.022

Salazar-Concha, C., Ficapal-Cusí, P., Boada-Grau, J., & Camacho, L.J. (2021). Analyzing the evolution of technostress: A science mapping approach. *Heliyon,* 7, 1-15. https://doi.org/10.1016/j.heliyon.2021.e06726

Salo, M., Pirkkalainen, H., Makkonen, M., & Hekkala, R. (2018). Distress, eustress, or no stress? Explaining smartphone users' different technostress responses. In ICIS 2018: Proceedings the 39th International Conference on Information Systems (pp. 1-17). *Association for Information Systems (AIS)*. https://aisel.aisnet.org/icis2018/behavior/Presentations/13/

Sharma, I., Tiwari, V., Gupta, S., & Rana, N.P. (2024). Examining the nexus between technostress and turnover intention: the moderating influence of PsyCap in Indian information management contexts. *Journal of Enterprise Information Management*, 1-24. https://doi.org/10.1108/JEIM-08-2023-0434

Soukupová, N., Kocourková, M., & Drahotová, K. (2024). Current approaches of stress management in the Czech business environment. *Central European Business Review*, 13(5), 1-30. https://doi.org/10.18267/j.cebr.373

Suharti, L., & Susanto, A. (2014). The impact of workload and technology competence on technostress and performance of employees. *Indian Journal of Commerce & Management Studies*, 5(2), 1-7.

Taneja, A., & Singh, E. (2018). Impact of technostress on organisational commitment in information technology sector. *Anusandhan the Research Repository of GIBS,* 1(1), 75-79.

Tarafdar, M., Salo, M., Pirkkalainen, H., & Makkonen, M. (2020). Taking on the "Dark Side"–coping with technostress. *Information and Knowledge Management*, 22(6), 82-89. https://doi.org/10.1109/MITP.2020.2977343

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. https://doi.org/10.2753/MIS0742-1222240109

Wang, X., & Li, B. (2019). Technostress among university teachers in higher education: A study using multidimensional person-environment misfit theory. *Frontiers in Psychology*, 10, 1-13. https://doi.org/10.3389/fpsyg.2019.01791

Wang, K., Shu, Q., & Tu, Q. (2008). Technostress under different organizational environments: An empirical investigation. *Computers in Human Behavior*, 24, 3002-3013. https://doi.org/10.1016/j.chb.2008.05.007

Zeeshan, M., Chaudhry, A.G., & Khan, S.E. (2020). Pandemic preparedness and techno stress among Faculty of DAIs in covid-19. *Sir Syed Journal of Education & Social Research*, 3(2), 383-396. https://doi.org/10.36902/sjesr-vol3-iss2-2020(383-396)