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The Dark Side of Digital Transformation: Reviewing the Antecedents and Consequences of Technostress in Organizations

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ABSTRAK

Perkembangan teknologi yang pesat telah membawa manfaat signifikan bagi organisasi dalam meningkatkan efisiensi dan produktivitas. Namun, adopsi teknologi juga menyebabkan tantangan psikologis yang dikenal sebagai technostress, yang dapat berdampak negatif pada individu maupun organisasi. Penelitian ini bertujuan untuk mengkaji determinan technostress serta implikasinya terhadap kinerja organisasi dengan menggunakan metode literature review.Hasil penelitian menunjukkan bahwa technostress dipengaruhi oleh berbagai faktor, termasuk techno-overload, techno-complexity, techno-insecurity, techno-uncertainty, dan techno-invasion. Faktor-faktor ini berkontribusi terhadap peningkatan beban kerja, kesulitan dalam memahami teknologi yang kompleks, ketidakamanan kerja akibat otomatisasi, serta ketidakpastian dalam menghadapi perubahan teknologi yang cepat. Selain itu, gangguan teknologi yang mengaburkan batas antara kehidupan profesional dan pribadi juga memperparah tingkat stres individu. Dampak dari technostress terhadap organisasi mencakup penurunan motivasi karyawan, peningkatan resistensi terhadap perubahan teknologi, serta berkurangnya produktivitas dan inovasi. Untuk mengatasi technostress, penelitian ini mengusulkan tiga strategi utama: strategi organisasi, yang mencakup pelatihan teknologi dan kebijakan kerja fleksibel; strategi desain teknologi, yang berfokus pada pengembangan sistem yang lebih ramah pengguna dan pengelolaan gangguan digital; serta mekanisme koping individu, yang melibatkan peningkatan literasi digital, pengelolaan stres, dan digital detox. Implikasi dari penelitian ini memberikan wawasan bagi akademisi dan praktisi dalam merancang kebijakan yang lebih adaptif untuk menghadapi tantangan digitalisasi, sehingga dapat menciptakan lingkungan kerja yang lebih sehat dan produktif.

Kata Kunci: Technostress, Beban Kerja, Teknologi

ABSTRACT

The advancement of digital technology has significantly contributed to organizational efficiency and productivity. However, it has also created psychological challenges known as technostress. This study aims to identify the determinants of technostress and its implications for organizational performance through a literature review approach. The findings reveal that technostress is influenced by five main dimensions: techno-overload, techno-complexity, techno-insecurity, techno-uncertainty, and techno-invasion. These factors contribute to increased workload, job uncertainty, work-life imbalance, and resistance to adopting new technologies. The impact of technostress on organizations includes decreased employee motivation, engagement, and productivity. In response, this study proposes three mitigation strategies: organizational strategies (e.g., training, technical support, and flexible work policies), technological design strategies (e.g., user-friendly systems and management of digital distractions), and individual coping strategies (e.g., enhancing digital literacy and stress management techniques). These findings are expected to provide both theoretical and practical contributions to the development of adaptive organizational policies in facing the challenges of digital transformation.

Keywords: Technostress, Workload, Technology

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INTRODUCTION

Rapid technological advancements have significantly altered organizational operations, compelling human resources to continuously adapt to technological changes (Tarafdar et al., 2019). In the contemporary digital era, technological adoption is crucial for organizations aiming to optimize

performance and enhance efficiency (Ragu-Nathan et al., 2008). The integration of digital tools and automation systems has streamlined operations, reduced costs, and improved overall productivity. Nevertheless, despite these evident benefits, certain organizations, particularly governmental institutions in Indonesia, still exhibit reluctance toward technology adoption. This reluctance is reflected in the low levels of technology adoption within these institutions (Martínez-Navalón et al., 2023). Resistance to technology adoption is frequently observed among senior employees who face difficulties in adapting to new technological environments. One major psychological barrier hindering this adaptation is technostress (Camarena & Fusi, 2022).

Technostress refers to psychological pressure and stress experienced by individuals due to their inability to cope with technological changes in the workplace (Ayyagari et al., 2011). This phenomenon manifests in various forms, including anxiety, fatigue, ineffectiveness, and skepticism toward new technology implementations (Brod, 1982). Employees experiencing technostress often feel overwhelmed by rapid technological advancements, leading to difficulties in maintaining their performance and adapting to new systems (Dragano & Lunau, 2020). Increased workload and constant pressure to improve technological skills further contribute to workplace stress, making it challenging for employees to accept digital transformation initiatives. Moreover, technostress is not merely an individual issue but also poses organizational challenges, directly impacting operational efficiency and innovation capabilities (Berger et al., 2023).

Technostress, as psychological pressure resulting from rapidly evolving technology usage, is influenced by several key indicators. Techno-overload occurs when individuals feel burdened by the need to work faster and longer due to technology (Panisoara et al., 2020). Techno-invasion reflects disruptions to work-life balance caused by unlimited work access facilitated by technology (Califf et al., 2020). Techno-complexity arises when individuals struggle to comprehend increasingly complex technology and feel inadequately skilled to utilize it effectively (Estrada-Muñoz et al., 2021). Additionally, techno-insecurity refers to the fear of job loss due to insufficient technological skills compared to more proficient colleagues (Jain et al., 2025). Lastly, techno-uncertainty describes uncertainty arising from rapid technological changes without adequate training, leading to confusion and anxiety (Califf et al., 2020).

A significant consequence of technostress on organizations is decreased employee motivation toward adopting new technology. Employees experiencing high levels of technostress tend to develop negative perceptions of technology, leading to reluctance in effectively utilizing digital tools and systems (Yener et al., 2021). This reluctance slows digitalization processes and limits the potential benefits technology could offer the organization. Furthermore, prolonged exposure to technostress may increase employees' intention to leave their jobs, reduce job satisfaction, and diminish overall employee engagement (Tarafdar et al., 2015). Organizations failing to manage technostress effectively may encounter long-term challenges, such as decreased employee engagement, lower productivity, and

resistance to change, ultimately hindering digital transformation efforts (Camarena & Fusi, 2022). Factors influencing technostress levels among individuals, particularly workers, include excessive job demands, lack of technological training, and insufficient technical support (Panisoara et al., 2020). Other contributing factors include technological complexity, invasion of technology into personal life, uncertainty associated with rapid technological changes (Califf et al., 2020), and job insecurity due to continuously evolving digital skill requirements (Estrada-Muñoz et al., 2021). Additionally, psychological factors such as confidence levels toward technology and unsupportive work environments exacerbate technostress (Jain et al., 2025).

Despite technostress significantly impacting organizational performance, research exploring the determinants of technostress within workplace environments remains limited (Martínez-Navalón et al., 2023). Understanding these determinants is essential for developing effective strategies to mitigate technostress and foster a more adaptive technological culture within organizations. Common factors influencing technostress include digital system complexity, frequency of software updates, inadequate training, and heightened expectations for constant connectivity (Tarafdar et al., 2019). These factors create demanding workplace environments, compelling continuous adaptation from employees, potentially resulting in mental fatigue and reduced productivity.

To address this research gap, the present study aims to bridge existing literature gaps through a comprehensive literature review on determinants of technostress and its impact on organizational performance. By identifying the primary factors contributing to technostress, this research aims to provide strategic recommendations on effectively managing technostress, enhancing technology adoption, and ultimately improving organizational productivity. Findings from this study are expected to contribute to academic discussions and practical implementations in workplace management, particularly in designing policies and interventions facilitating smoother transitions toward digital transformation. By effectively managing technostress, organizations can ensure their workforce remains motivated, engaged, and productive within increasingly digitalized work environments.

METHOD

This study adopts a narrative literature review approach to explore the antecedents and consequences of technostress in organizational settings. The literature review was conducted to synthesize findings from recent empirical studies, conceptual frameworks, and theoretical contributions in the field of information systems and organizational behavior.

To ensure relevance and recency, a structured search was performed using three academic databases: Google Scholar, Emerald Insight, and ScienceDirect. The search was limited to articles published within the last five years (2019–2024) to capture the most up-to-date perspectives on technostress, particularly in the context of digital transformation and remote work. The primary keywords

used in the search included: *"technostress"*, *"techno-overload"*, *"technology-related stress in organizations"*, and *"technology and mental health at work"*.

The inclusion criteria for selecting articles were as follows:

1. Empirical or conceptual studies focusing on technostress in organizational or workplace settings.
2. Articles published in peer-reviewed journals.
3. Studies available in full-text English language.
4. Research that identifies specific antecedents (e.g., techno-overload, techno-insecurity) or consequences (e.g., performance, mental health) of technostress.

After screening titles and abstracts, and reviewing full-text articles, approximately 35 relevant journal articles were included in the final analysis. The selected literature was reviewed thematically, with emphasis on identifying key stressors (antecedents), individual and organizational impacts (consequences), and proposed coping or mitigation strategies.

This methodology enables a comprehensive understanding of technostress while accommodating a broader yet focused integration of diverse scholarly viewpoints. Although not employing a systematic review protocol such as PRISMA, this approach ensures methodological transparency and analytical rigor appropriate for an exploratory thematic review.

RESULT

Antecedent of Technostress

1. Techno overload

Techno-overload occurs when employees feel pressured to work faster and handle more tasks due to technology (Tarafdar et al., 2007). Rapid advances in digital tools often lead to increased expectations from employers, requiring employees to complete more work in less time. This increased workload can cause cognitive stress and decrease job satisfaction (Califf et al., 2020). In addition, overuse of technology can lead to constant distraction and multitasking, which negatively impacts concentration and efficiency. Employees often have difficulty keeping up with multiple communication channels, such as email, instant messaging and project management tools, further exacerbating their stress levels (Dragano & Lunau, 2020). Research shows that long-term exposure to techno-overload can lead to burnout, increased absenteeism, and decreased overall organizational productivity (Bourlakis et al., 2023). Therefore, organizations need to establish clear technology use policies and provide training to help employees manage their workload more effectively.

2. Techno-Complexity

Techno-complexity denotes the strain workers encounter when required to acquire and adjust to intricate and swiftly advancing technology (Ragu-Nathan et al., 2008). Numerous employees struggle to adapt to regular software changes, new apps, and complex digital systems necessitating extensive training.

This complexity may induce dissatisfaction and diminish productivity, particularly for staff without adequate digital competencies. Organizations that adopt new technology without enough training and assistance may cause workers to feel overwhelmed and hesitant to adapt (Panisoara et al., 2020). To mitigate techno-complexity, firms have to engage in ongoing educational initiatives, streamline digital tools, and guarantee intuitive system architecture. Offering practical training and prompt technical assistance may alleviate stress and enhance technology adoption.

3. Techno-Insecurity

Techno-insecurity arises when employees worry that technological advances will make their skills obsolete or lead to job loss (Tarafdar et al., 2015). As automation and artificial intelligence grow, many workers feel uncertain about their job stability and career prospects. This insecurity is especially prevalent in industries undergoing digital transformation, where companies are replacing manual processes with automated solutions. Employees who feel they have no opportunities to improve their skills are likely to experience anxiety and decreased motivation (Estrada-Muñoz et al., 2021). Organizations can address techno-insecurity by building a culture of continuous learning and offering reskilling programs. Encouraging employees to acquire new digital competencies can boost their confidence and job security in an increasingly technology-driven environment.

4. Techno-Uncertainty

Techno-uncertainty denotes the anxiety induced by erratic technology advancements and the instability of digital instruments (Jain et al., 2025). Employees often find it challenging to adapt to continual system upgrades, policy modifications, and advancing workplace technology. This ambiguity may result in confusion and dissatisfaction, particularly when companies inadequately convey changes. Employees lacking clarity on the technology adoption process may oppose new systems, thus impeding overall productivity (Bahamondes-Rosado et al., 2023). To mitigate technological uncertainty, firms must to formulate a definitive transition strategy, provide consistent updates, and include workers in the decision-making process. Facilitating honest communication and a systematic execution approach helps mitigate opposition to technological change.

5. Techno-Invasion

Techno-invasion occurs when technology blurs the lines between work life and personal life. With the proliferation of remote work and digital communication, employees often feel obligated to stay connected to work outside of working hours (Califf et al., 2020). The expectation to always respond to emails, messages and virtual meetings outside of work hours contributes to work-life imbalance and increased stress. Employees may struggle to truly "disconnect," leading to burnout and decreased well-being (Panisoara et al., 2020). Organizations should implement policies that encourage work-life balance, such as limiting communication outside of working hours and encouraging employees to take time off.

Providing clear guidelines on technology use can help employees maintain a healthier separation between work and personal time.

6. Other Influencing Factor

a. Stress In Human-Machine Interaction

Suboptimal human-machine interaction may induce stress, particularly when the system or robot fails to function as anticipated. The intricacy of automation systems sometimes heightens employee concern, particularly among those without a strong technical foundation (Dragano & Lunau, 2020). The system's failure to adapt to user requirements may result in frustration and diminished work efficiency. Furthermore, inadequate technology design, characterized by a non-intuitive interface or a system plagued by frequent mistakes, may exacerbate the user experience. Data processing errors or challenging navigation may impede worker productivity and elevate cognitive stress (Califf et al., 2020). Consequently, enterprises must guarantee that the technology used has an intuitive design and offers sufficient training for personnel.

Methods to alleviate stress in human-machine interaction include enhancing user experience (UX) in system design, offering explicit instructions, and ensuring prompt and effective technical help. Consequently, organizations may enhance technology adoption and diminish resistance to the implementation of new systems (Panisoara et al., 2020).

b. Technological Workplace Surveillance

Technology-based monitoring in the workplace, such as the use of productivity tracking software or monitoring employees through cameras, can increase anxiety and psychological distress. Studies show that too much monitoring can reduce work motivation and increase employee dissatisfaction as they feel less trusted by management (Bourlakis et al., 2023). Employees who are constantly supervised tend to experience higher stress and a reduced sense of autonomy at work. This can lead to increased levels of burnout and turnover in the organization, especially if monitoring is used to pressure employees rather than support them (Jain et al., 2025). Therefore, it is important for companies to find a balance between the need for supervision and reasonable work freedom. To address the negative impact of technology monitoring, organizations can implement transparency policies, ensuring that the purpose of monitoring is clear and does not violate employee privacy. In addition, trust-based approaches and flexibility in work systems can help reduce negative perceptions of technology surveillance (Bahamondes-Rosado et al., 2023).

Impact of Technostress on Organizational Performance

1. Effects on Individual Well-being and Mental Health

Individual factors play a key role in determining the extent to which an individual experiences technostress. One of the main factors is technological competence, where individuals with lower technological skills are more prone to experience difficulties in understanding and adapting new systems

(Banerjee & Gupta, 2024). The inability to use technology well can lead to anxiety and self-confidence, which in turn increases the level of technostress. In addition, resistance to change is also a significant factor. Some individuals have a tendency to resist new technology because they are comfortable with existing work methods or find it difficult to adapt to evolving technology (Fernández-Fernández et al., 2023). Chronic activation of the stress response due to over-reliance on technology can lead to various mental health problems, including anxiety and depression.

Research indicates a relationship between technostress and adverse mental health effects, including cognitive complaints and fatigue, particularly in high-intensity work settings and under time constraints (Berg et al., 2017; Dragano & Lunau, 2020). Technological complexity increases stress levels, impacting cognitive load and leading to feelings of ineffectiveness and burnout (Kasemy et al., 2022). This resistance may intensify the stress experienced by individuals, particularly in workplaces that are swiftly integrating technology. Digital fatigue is an increasingly recognized factor. The frequent utilization of technology in professional and educational environments may result in mental and emotional fatigue, adversely affecting an individual's productivity and psychological health (Harris et al., 2022). Recent studies indicate that personality traits, including neuroticism and perfectionism, may elevate the risk of technostress. Individuals exhibiting these tendencies experience greater challenges in managing stress associated with technology use in their daily work (Zhao et al., 2024).

2. Effects on Employee Performance and Productivity

Organizational factors significantly influence the extent of technostress experienced by employees in the workplace. Technology-driven work pressure significantly contributes to technostress, particularly as employees are required to accomplish a greater number of tasks in reduced timeframes due to automation and digitization (Khedhaouria et al., 2024). Technology intended to enhance productivity may inadvertently impose a burden on employees if not effectively managed. The interplay between technology-induced stress and employee performance is intricate. Although technology is designed to enhance efficiency, an excessive workload and stress induced by technology can negatively impact productivity (Ramesh et al., 2021). Increased stress levels may lead to diminished job satisfaction and reduced organizational commitment among employees. The interplay between technostress and other work-related stressors fosters an environment in which employees find it challenging to fulfill performance expectations (Yener et al., 2020).

Another factor is organizational support, encompassing training, technical guidance, and sufficient infrastructure. Research indicates that employees receiving adequate organizational support exhibit reduced levels of technostress compared to those who must independently navigate new technologies (Banerjee & Gupta, 2024). Insufficient organizational support may result in employees experiencing isolation and helplessness regarding the challenges posed by advancing technological requirements. Moreover, virtual communication and interactions that substitute face-to-face engagement may influence

levels of technostress. The excessive use of digital communication tools may diminish social engagement and contribute to feelings of isolation, particularly in remote work settings (Fernández-Fernández et al., 2023). Furthermore, the implementation of technology-based supervision, including performance tracking software, may elevate employees' psychological distress and diminish work motivation (Harris et al., 2022).

3. Long-term Organizational Implications

The long-term effects of technology stress on organizations are significant, influencing overall health, performance, and sustainability. The adverse effects of technology stress may result in elevated employee turnover rates, diminished employee engagement, and lowered organizational commitment, thereby posing challenges for talent retention and acquisition (Marchiori et al., 2020). Organizational culture must evolve to acknowledge the significance of mental health and well-being in creating a supportive work environment. Social environmental pressures contribute to the escalation of technostress among individuals. The expectation of constant connectivity significantly pressures individuals to remain available online and respond promptly to work or academic communications (Zhao et al., 2024). This phenomenon is intensified by a work culture that requires immediate responses, particularly in technology-related positions. Moreover, pressure from colleagues or superiors can contribute to an individual's psychological burden. Employees frequently perceive a necessity to align with the expectations of superiors or colleagues in rapidly mastering new technologies (Fernández-Fernández et al., 2023). Individuals who perceive a lack of technological understanding may experience increased anxiety and diminished confidence in their professional capabilities. The enduring effects of social pressure on organizations may encompass heightened employee turnover rates, diminished employee engagement, and a weakening culture of innovation within the organization (Panisoara et al., 2020).

Strategies to Mitigate Technostress

1. Organizational Strategies

Organizations must prioritize the reduction of technostress by implementing inclusive training, establishing support systems, and formulating effective technology policies. Providing structured digital training and adequate technical support is among the most effective measures. Research indicates that employees who undergo regular technology training exhibit reduced stress levels and demonstrate greater adaptability to new systems compared to those lacking such training (Harris et al., 2022). Ongoing training equips employees with the necessary skills to effectively engage with the digital landscape. Organizations should implement support systems that encompass technical assistance services, digital mentorship, and flexible work policies. The implementation of a technology mentoring system can assist employees in addressing technical challenges encountered in their daily tasks (Khedhaouria et al., 2024). Organizations may implement inclusive technology policies that ensure digital systems are accessible to

various skill levels and employee requirements (Bahamondes-Rosado et al., 2023). Flexible work policies significantly contribute to the mitigation of technostress. The adoption of a flexible hybrid or remote work system enables employees to more effectively manage their workload. Without clear boundaries, employees often experience techno-invasion, characterized by the perception that they must remain connected to work beyond designated working hours. Consequently, organizations must establish policies that restrict work-related communication beyond operating hours to ensure the preservation of work-life balance (Panisoara et al., 2020).

2. Technological Design Strategies

In addition to organizational policies, technology design-based strategies also play an important role in reducing technostress. One of the main ways to achieve this is through the development of user-friendly systems. Software and applications that have intuitive navigation and simple interface design have been shown to reduce user frustration and accelerate adaptation to new systems (Banerjee & Gupta, 2024). Technology that is too complex or difficult to understand often increases user anxiety and hinders productivity. Simplification of digital interfaces is also a major factor in reducing technostress. Applications with simple and minimalist designs, as well as the reduction of unnecessary features, can help users access information and complete tasks more efficiently (Estrada-Muñoz et al., 2022). By ensuring that technology systems are designed with user-centric principles, organizations can improve user experience and reduce stress caused by confusing systems.

Moreover, the management of digital distractions constitutes a significant strategy for mitigating technostress. Effective management of notifications by organizations and individuals is essential for minimizing distractions and enhancing work efficiency. Features like "focus time" mode and selective notification settings can mitigate unnecessary digital interruptions (Harris et al., 2022). Limiting distractions from digital communication tools enables users to concentrate on task completion without undue pressure. The reliability of technological systems constitutes a significant element of this strategy. Software characterized by frequent glitches or inadequate security can induce psychological stress in users. Consequently, organizations ought to allocate resources towards establishing a robust technological infrastructure and implementing effective security systems to mitigate distractions that may elevate work-related stress (Fernández-Fernández et al., 2023).

3. Individual Coping Mechanisms

Alongside organizational and technical initiatives, people play a crucial role in managing technostress by using efficient coping mechanisms. A primary measure that may be implemented is the enhancement of digital literacy. Individuals with elevated technical proficiency often encounter less anxiety when confronted with novel digital systems. Studies indicate that continuous technology training programs may enhance confidence in using digital devices and diminish irritation stemming from inadequate technical abilities (Ragu-Nathan et al., 2008). Moreover, effective time management and

digital detoxification are essential tactics for mitigating the adverse effects of excessive technology use. Imposing restrictions on digital device use, including minimizing screen time post-work and using time management strategies like time-blocking, has shown efficacy in alleviating mental tiredness induced by continuous technological exposure (Salanova et al., 2013). By using these tactics, people may achieve equilibrium between the obligations of digital work and their personal life.

Stress management strategies are crucial in addressing technology-induced stress. Mindfulness, meditation, and breathing exercises have been empirically shown to alleviate stress caused by digital overload (Tarafdar et al., 2019). Recent research indicates that physical activities, including regular exercise and engagement with environment, might mitigate the adverse effects of excessive technology use (Zhao et al., 2024). Moreover, humans may alter their perception of technology via cognitive adaptation. Cognitive Behavioral Therapy (CBT) has been used to assist people in overcoming technology-related anxiety by reframing their interpretation of digital interactions as manageable tasks rather than daunting dangers (Jain et al., 2025).

Social support has a crucial part in alleviating technostress. Individuals, whether employees or students, who possess a supportive learning community or colleagues are more adept at managing technological problems compared to those who see themselves as alone and without assistance (Ayyagari et al., 2011). Consequently, establishing social networks and engaging in technological discussion forums may serve as an effective remedy. Ultimately, techniques for technology customisation may assist consumers in alleviating digital gadget tiredness. Modifications, like altering screen brightness, reorganizing app layouts for enhanced accessibility, and using tools like blue light filters and concentrate modes, might mitigate mental and physical strain resulting from prolonged technology use (Kumar, 2024).

CONCLUSION

This research investigates technostress as a result of rapid technology advancements in professional and educational settings. The study's findings reveal that technostress is a considerable burden for both people and companies. Technostress individually contributes to heightened cognitive load, mental fatigue, anxiety, and work discontent. From an organizational standpoint, technostress leads to diminished productivity, heightened absenteeism, and opposition to technology advancements. This research identifies four primary characteristics of technostress: techno-overload, techno-complexity, techno-insecurity, techno-uncertainty, and techno-invasion. The heightened workload from technology use, the intricacy of digital systems necessitating extended adaption periods, and the ambiguity around job security owing to automation are the primary elements that induce technostress. Moreover, the use of technology that obscures the distinctions between work and home life exacerbates individual stress levels. Technostress adversely affects firms by diminishing employee engagement, reducing job

motivation, and increasing attrition rates. Consequently, a holistic strategy is essential to mitigate technostress, which may be classified into three primary approaches: organizational strategy, technology design strategy, and individual coping techniques. Organizational tactics include the provision of ongoing technological training, agile technical support, and adaptable work practices that promote work-life equilibrium. Technology design strategies prioritize the creation of more user-centric systems, the simplification of digital interfaces, and the mitigation of digital distractions to enhance user experience. Concurrently, personal coping strategies include enhancing digital literacy, managing time effectively, engaging in digital detoxification, and using stress management methods like as mindfulness and Cognitive Behavioral Therapy (CBT). This research suggests that by using suitable mitigation techniques, businesses may diminish the adverse effects of technostress, enhance employee well-being, and promote successful technology adoption in the workplace. This research aims to provide theoretical and practical insights to scholars and stakeholders in formulating policies that are more responsive to the problems posed by digitalization.

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