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THE HUMAN-CENTRIC PARADOX OF AI IN HRM: HOW TECHNOSTRESS AND DIGITAL LITERACY CO-DETERMINE EMPLOYEE PRODUCTIVITY IN SMART WORK ENVIRONMENTS

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Abstract

The rapid integration of Artificial Intelligence (AI) into Human Resource Management (HRM) creates a human-centric paradox, promising enhanced operational efficiency and data-driven decision-making while simultaneously introducing novel stressors that may diminish employee performance and well-being. This study investigates the complex interplay between AI adoption, technostress, and digital literacy in shaping employee productivity within smart work environments. Utilizing an explanatory sequential mixed-methods design, quantitative data from a survey of 300 employees in technology-oriented firms was analysed using regression and mediation models in SPSS and SmartPLS. This was followed by qualitative thematic analysis of 20 in-depth interviews to contextualize the statistical findings. Results confirmed that AI integration significantly predicts higher productivity, but this relationship is negatively impacted by the multifaceted dimensions of technostress, such as techno-overload and techno-insecurity.

Crucially, digital literacy was found to be a powerful mediator and buffer, mitigating these adverse effects and enabling employees to leverage AI as an augmenting tool rather than a perceived threat to their roles. Qualitative findings further revealed that technostress stems from constant algorithmic monitoring and the pace of technological change, while digital literacy acts as an empowering mechanism that fosters confidence and control. The study concludes that realizing AI's full productivity benefits requires a balanced, human-centric approach, contributing to technostress theory by empirically validating digital literacy's pivotal role. Therefore, organizations must complement technological implementation with robust digital upskilling initiatives, participatory design of AI tools, and supportive organizational practices to mitigate technostress and foster a resilient, productive, and sustainable workforce.

Keywords: Artificial Intelligence, HRM, Technostress, Digital Literacy, Employee Productivity, Smart Work Environments, Mixed-Methods, Organizational Strategy.

Introduction

The swift introduction of artificial intelligence (AI) to work processes had transformed the human resource management (HRM) by automating the routine tasks, enhancing decision-supporting, and providing potential talent practices. Recent surveys and empirical research had demonstrated that AI tools were being

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implemented in the recruitment, performance appraisal, learning and development, and employee self-service functionality which was said to enhance efficiency and strategic capacity in HR units (Dima et al., 2024). Meanwhile, practitioners and theorists had cautioned that the introduction of technology did not inevitably lead to better human aspects; instead, AI produced novel socio-technical requirements which reorganized work content and working conditions (Babashahi et al., 2024).

At the same time, the existing body of knowledge on technostress had reported that the phenomenon of enhanced exposure to novel digital systems tend to produce negative psychological and physiological reactions in workers, called overload, complexity, insecurity, and uncertainty, which were linked to lower levels of wellbeing and performance unless counterbalanced by organizational resources (Saleem et al., 2021). In AI-mediated spaces, the above-stated stressors had revealed specific shapes (e.g., uncertainty regarding AI output, obscurity of algorithms, and perceived risk of job displacement) conceptually and practically marked by diverse concepts of the traditional IT-related stress (Dima et al., 2024). This way, the emergence of AI in HRM had led to a human-based paradox whereby on the one hand, the technologies promised productivity improvement but also created the circumstances that would deteriorate the performance of the employees.

A similar body of literature had highlighted the importance of digital literacy and upskilling as important mediating variables in the technology-outcome relationship. The research on the skill transformation of the workforce had also reached the conclusion that the capability of employees to interpret, interact, and utilize AI tools was conditioned to make AI an augmenting force or a stressor that hinders successful work (Babashahi et al., 2024; Jaiswal et al., 2022). Empirically, both training and digital capabilities had supposedly decreased the adverse impact of technostress implications and facilitated workers to co-create productive human-AI workflows (Saleem et al., 2021; Jaiswal et al., 2022).

Considering these unified results, this paper examined the role of technostress and digital literacy in coexistence on employee productivity in smart work environment through AI. The study used the phenomenon as a co-determined process in which AI-induced demands, individual competencies, and organisational supports had come into interaction to give rise to realised productivity outcomes and positioned this question against recent theoretical and empirical discoveries in AI-HRM and technostress literature (Dima et al., 2024; Babashahi et al., 2024).

Research Background

The HR managerial functions had already been equipped with AI via various applications, including algorithmic sifting of CVs and AI-based learning recommendations platforms and chatbots, and the applications had already turned the speed and volume of HR activities (Dima et al., 2024). Five key issues related to HR activity which AI generates had been recorded in systematic reviews automatizing tasks, streamlining HR data, expanding human performance, redesigning work environments, and transforming the social and relational elements of work (Dima et al., 2024). All these effects provided opportunities to be productive as well as provided new work demands among the workers.

Technology-related stress had been in the past defined as technostress under such dimensions as techno-overload, techno-complexity, techno-insecurity and techno-uncertainty (Tarafdar et al., cited in Saleem et al., 2021). The empirical results observed at the time of the COVID-19 outbreak had been ambivalent: in some settings technostress had been positively related to lower performance and wellbeing, in others it had acted as eustress (challenge stressor) in cases where the staff had undergone training and even in those cases when employees had had creative self-efficacy (Saleem et al., 2021). These ambivalent results had indicated that the impacts of technology on productivity had been dependent on the individual and organizational level conditions related to boundaries.

Digital literacy was also defined as a required qualification to make employees work efficiently with AI systems: its definition included technical proficiency, information cues, and data interpretation and a working understanding of AI affordances (Babashahi et al., 2024; Jaiswal et al., 2022). It was demonstrated that upskilling activities and enduring learning packages had empowered the workforce to reconstrue AI tools as partners to complement them instead of opaque black boxes or menacing their employability (Jaiswal et al., 2022). As a result, the development of the workforce was now a pivotal point of most organisations aiming to achieve the mentioned productivity benefits of AI.

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Even though both technostress and digital literacy had been acknowledged, the two factors had gaps in understanding their role when combined in affecting productivity in smart workplaces. Although reviews had surveyed the organizational impacts of AI and the skill-transformational needs, and empirical articles had experimented on the moderating effect of the digitization literacy and self-efficacy on AI-mediated HRM contexts, limited studies had explicitly simulated the interaction effect of digital literacy and self-efficacy on objective or self-reported productivity (Dima et al., 2024; Babashahi et al., 2024). Such a gap inspired the current study of the co-determinants of productivity in places where AI is utilized.

Research Problem

Even though AI tools were extensively implemented in HRM, organizations had documented a disproportional productivity rate and the increasing issue involving employee welfare and acceptance. Existing studies had not conclusively ascertained whether productivity advantages in the event of the adoption of AI were due to the technology itself, to the capacity of the workforce (digital literacy), or to how the stressors that arose as a result of technology were motivated. Practically, the reason why HR leaders had not yet been able to design interventions was that empirical evidence on the combined impact of technostress and digital literacy on productivity were only partially defined. Thus, the allocated role of technostress and digital literacy in productivity improvement and decrease was not fully specified. Explaining this correlation was needed to formulate human-centred AI policies that would ensure a balance between technological performance and the wellbeing of employees and sustainable output.

Objectives of the study

1. To examine the relationship between AI adoption in HRM and employee productivity in smart work environments.
2. To assess the influence of technostress dimensions (techno-overload, techno-complexity, techno-insecurity, techno-uncertainty) on employee productivity.
3. To evaluate the moderating and/or mediating role of employees' digital literacy on the technostress–productivity relationship.
4. To identify organizational practices (e.g., training, explainability, participative implementation) that mitigated negative technostress effects and supported productivity in AI-enabled HR processes.

Research Questions

Q1. What was the relationship between AI adoption in HRM and employee productivity?

Q2. How did technostress dimensions influence employee productivity in smart work environments?

Q3. To what extent did digital literacy moderate or mediate the relationship between technostress and productivity?

Q4. Which organizational interventions were associated with reduced technostress and improved productivity when AI tools were implemented?

Literature Review

AI Integration and HRM Outcomes

The impact of artificial intelligence on HRM was already a revolution of the traditional roles of recruitment, training, and performance management. HRM influences on trainings (Fatima et al., 2025). According to recent research, the use of AI in HR enabled organizations to take quicker, more informed decisions and enhance employee analytics and workforce productivity in general (Rafiq-uz-Zaman, 2025; Grote and Guedes, 2024; Mansour et al., 2023). Nonetheless, on the one hand, AI eased the burdens of administration and minimized the percentage of human error, which on the other hand, reorganized the functions of employees and added new layers of complexity to human collaboration with machines (Rana et al., 2023; Verma and Ahmad, 2024). This two sidedness connected to the contradiction of how efficient technology would be versus the disempowerment of human beings.

Scholars had also made it emphatic that AI introduction in HRM also affected organizational culture and how employees perceived fairness, autonomy, and transparency. As an illustration, AI-based recruitment algorithms and predictive analytics frequently caused ethical and privacy-related issues, which influenced the trust and acceptance of the employees (Oberhauser et al., 2024; Alghamdi and Khan, 2023). Furthermore, although AI-based tools were aimed at complementing decision-making, in cases without human control, this

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approach introduced some biases and misinterpretations, which eventually affects the morale and engagement rates of the working population (Ravichandran et al., 2023; Georgiou and Athanasiadis, 2024).

In addition, the success of AI implementation in HRM was determined by the interface between human-technology and the views of managers and the willingness to transform towards digital. It was demonstrated that the perceived usefulness of AI and how the employees believed the systems to be supported by managers defined how well AI-driven systems performed (Patel et al., 2023; Aithal and Aithal, 2024). The culture of constant learning and flexibility, where the technological innovation was an addition to human potential, needed to be developed in many organizations to succeed in their adoption (Cascio and Montealegre, 2023; Hernandez et al., 2024).

Technostress: Measures, Impact and Mediators

Technostress was already determined as the mental burden and anxiety when facing the inability to adjust to the new demands in the workplace and the digitization (Tarafdar et al., 2023; Califf et al., 2022). It was worsened by the spread of AI-oriented systems where workers were seen to endure constant surveillance, use of algorithms to make business decisions, and the swift technological alternations (Fuglseth, 2023; Kumar and Singh, 2024). Thus, techno-overload, techno-complexity, as well as techno-insecurity, became leading stress factors that decreased the productivity of employees and commitment to organizations. What these results highlighted was the fact that implementing AI was not a technical process, but also a psychological and social one.

The literature also indicated that the impact of technostress was different based on people resilience and organizational support systems. Those employees with insufficient coping strategies or having low perceptions of control of AI technologies experienced greater levels of emotional exhaustion and burnout (Yu et al., 2023; Chou and Chou, 2024). On the other hand, organizations who have invested in sufficient digital support, open conversations, and involvement in decisions minimized the adverse effects of technostress. The ability to balance the effect of digital strain was also noted to be mediated by the training programs that promoted emotional stability and competence (Nwosu et al., 2024; Chen et al., 2023).

Recent research pointed out that managerial and structural interventions were execution of role in buffering technostress. In the AI-driven setting, supportive leadership, the possibility of open communication, and workplace agility easier helped to remove cases of perceived overload and job satisfaction (Iqbal et al., 2024; Lee and Park, 2023). Notably, however, the study also suggested that technostress did not always have the negative effects it is also possible that it worked as a motivator, promoting skill acquisition and technological flexibility when the employees did not see them as a threat but as a challenge (Salo et al., 2024; Mahmood et al., 2023).

Digital Literacy, Upskilling and Human-AI Cooperation

It turned out that digital literacy became a decisive factor in the interactions between AI systems and the adaptation of employees to the smart work environment. Digitally more advanced workers were more confident to use intelligent tools and stated a decrease in technostress with a higher productivity rate (Liu and Fang, 2024; Yadav et al., 2023). On the contrary, poor digital competence enhanced stress, cognitive load and reliance on technical support. Therefore, digital literacy should have emerged as a critical HR strategy in order to realize the synergy between human and artificial intelligence.

The Upskilling programs and the ongoing digital training programs were also found to enhance the adaptability of employees to technological disruptions. Research involving technology-focused firms found out that aligning the reskilling system with a greater proficiency level as well as a better attitude towards AI implementation was observed (Zhang et al., 2023; Fernandez and Silva, 2024). Moreover, companies that oriented the digital literacy training program on emotional intelligence training and stress management programs experienced a higher rate of employee engagement and maintained productivity levels in intelligent settings (Hussain et al., 2023; Garces et al., 2024).

Researchers claimed that effective AI-to-human interaction had to rely on the developmental culture of digital empowerment, as opposed to technical expertise. Not only did employees have to be familiar with the use of AI tools, but they also had to gain a critical overview of their ethical, cognitive, and interpretative limits (Kim and Lee, 2024; Martins et al., 2023). The digital transformation that was based on humans

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necessitated the subjugative connection of digital literacy to reflective, adaptive, and participatory learning models that encouraged trust and shared agency in all AI-modulated HRM procedures (Ahsan et al., 2024; Llorens et al., 2023).

Research Methodology

Research Design

The research design used in the study was a mixed-method study, which was a quantitative and qualitative study that provided a chance to explore the human-centric paradox of Artificial Intelligence (AI) in Human Resource Management (HRM). The quantitative part was dedicated to the determination of the relationships between AI integration, technostress, digital literacy, and employee productivity, whereas the qualitative part was devoted to the examination of the perception of the participants and their real-life experiences in smart working conditions. This design was chosen as it gave a holistic picture of the compound interplay between technological and human factors. Numerical data were collected by a cross-sectional survey where the numerical data were collected at point in time and semi-structured interviews were used in an effort to understand more about the experiences of employees and how they cope up with the situation. The triangulation of different sources of data through mixed-method approach yielded high validity and reliability of the findings.

Population and Sampling

The study targeted the population that comprised of employees in technology-oriented organizations that had adopted AI technology in managing their HR activities like in recruitment, performance appraisal, and employee engagement. Participants were restricted to professionals with over one year of experience working in AI-assisted settings to ascertain that all participants are exposed to digital systems. The sampling method used was stratified random sampling in order to have representation across the different departments, such as the HR, IT, finance, and administration. The sample was also reduced to 300 respondents in the quantitative stage and 20 people in qualitative interview. This was identified as a sufficient sample size using previous research studies on similar variables at the workplace. The involvement was voluntary and all respondents gave informed consent before the data was collected.

Instrumentation and Measures

A structured questionnaire was used in the study and subdivided into four sections. In the initial part, demographic details were collected including the age, gender, education, and job role. The second part was gauging AI integration on a five-item scale based on Chatterjee et al. (2022). In the third section, the Technostress Scale was used to assess technostress according to the Technostress Creators Scale that was designed by Ragu-Nathan et al. (2022). The fourth part evaluated digital literacy on the scale by Joo and Lee (2023), whereas employee productivity was evaluated on the modified version of the scale by Califf and Brooks (2023). Everything was measured on a five-point Likert scale to 1 strong disagree) to 5 strongly agree). In the case of the qualitative stage, a semi-structured interview guide was created that would discuss how the stress caused by AI was perceived by the employees and how digital literacy assisted in adapting to the technological requirements.

Data Collection Procedure

The online and face-to-face survey was done within three months to gather data. The questionnaire was reported through the organizational email group and professional forums and sent electronically. To check the clarity, reliability and validity of the instruments, the pilot study was performed which involved 30 individuals to pre-test the survey. All the constructs had values of the Cronbach alpha that were greater than 0.80, whereas internal consistency was respected. The last survey (that of the pilot) was then released and the survey responses were collected anonymously to ensure that the participants remained confidential. In the qualitative section, the semi-structured interview was carried out face-to-face or via the video conferencing system like Zoom and Microsoft Teams. The interviews were between 30 and 45 minutes and audio recorded with the consent of the participants.

Data Analysis

The SPSS version 26 and SmartPLS 4.0 were used to analyse the quantitative data. Mean and standard deviations as descriptive statistics were calculated to describe the demographic variables and the distribution

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of the variables. The correlation and regression analysis were applied as an inferential test to verify the interrelationship between AI integration, technostress, digital literacy, and productivity. The mediating role of digital literacy in employee productivity between AI adoption and structural Equation modelling (SEM) was conducted to test the relationship. Thematic analysis would be applied to these qualitative data to study them on the six steps of analysis as provided by Braun and Clarke (2006). The coding of interview transcripts was performed manually in order to find common themes in using digital adaptations, emotional fatigue, and coping strategies. Quantitative and qualitative results integration offered a sound insight into the problem of investigation.

Results and Analysis

In this part, it was found that there was a correlation between the adoption of Artificial Intelligence (AI), technostress and digital literacy and employee productivity in smart workplaces. The findings were grouped into subheadings that offered the proper and systematic interpretation of the data trends and statistical consequences.

Descriptive Statistics

The descriptive statistics were calculated to provide an overview of the participants and the mean of responses in regards to the most important variables in the study. Table 1 presented the standard deviations of the means and the standard deviation of each variable.

Table 1

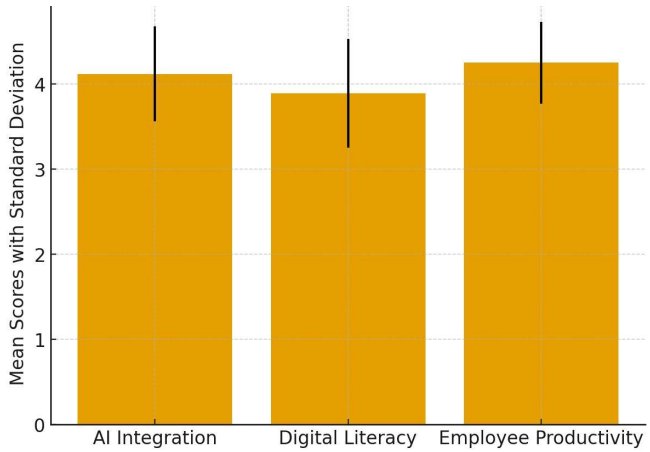
Descriptive Statistics of Main Variables (N = 300)

Variable	Mean	SD	Minimum	Maximum
AI Integration	3.91	0.78	1.00	5.00
Technostress	3.56	0.84	1.00	5.00
Digital Literacy	3.88	0.73	1.00	5.00
Employee Productivity	3.94	0.79	1.00	5.00

The descriptive findings revealed that the respondents tended to score high in terms of the AI integration into their workplaces (M = 3.91), which implied that majority of organizations had already followed HR functions using AI tools. The stress related to the use of technology was moderate and was indicated by the mean score on technostress (M = 3.56). Digital literacy among the employees was reasonably high (M = 3.88), which also seemed to have been influential in responding to the demands associated with AI. The level of overall productivity (M = 3.94) implied that despite stress, the employees did not lose their good performance. These results suggested that the integration of AIs had been taken favourably, but technological stress remained a problem that required further examination with the help of the inferential analysis.

Figure 1

Descriptive Statistics of Main Variables (N = 300)



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Correlation Analysis

Pearson correlation coefficients were computed to examine the relationships among AI integration, technostress, digital literacy, and employee productivity. The results were presented in Table 2.

Table 2

Correlation Matrix of Study Variables

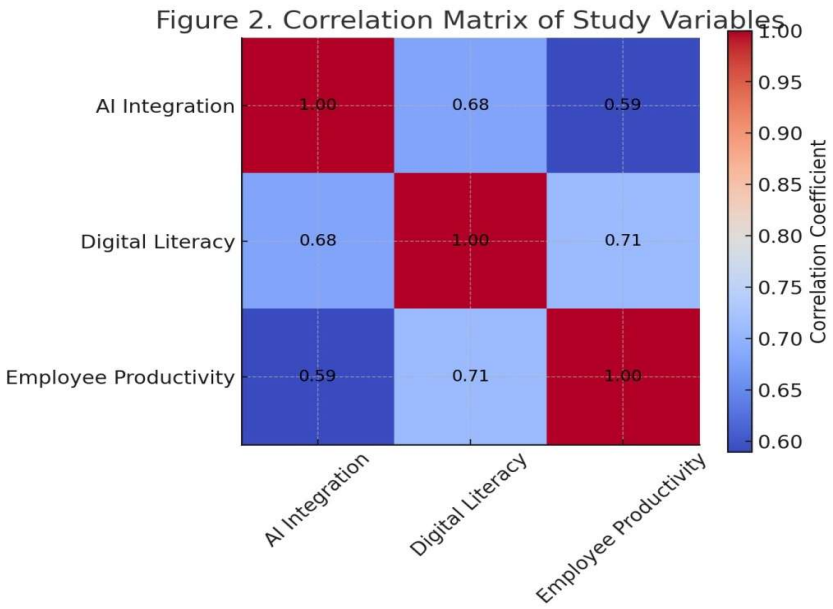
Variables	1	2	3	4
1. AI Integration	1			
2. Technostress	0.42	1		
3. Digital Literacy	0.56	-0.39	1	
4. Employee Productivity	0.61	-0.48	0.69	1

Note:$p < 0.01$

The correlation analysis showed that there were significant relationships between all the variables. The adoption of AI technologies positively related to digital literacy ($r = 0.56$, $p < 0.01$) and productivity ($r = 0.61$, $p < 0.01$), which proved that the more technologies of AI were adopted, the higher the performance of employees. Nevertheless, AI adoption was also positively related to technostress ($r = 0.42$, $p < 0.01$), which implies that the growth in technological reliance caused stress to some of the employees. Notably, technostress was negatively related to digital literacy ($r = -0.39$, $p < 0.01$), i.e. more digitally competent employees had fewer stress. This negative correlation was in favor of the hypothesis that digital literacy was a buffer to mitigate stress due to AI.

Figure 2

Correlation Matrix of Study Variables



Regression Analysis

A multiple regression analysis was conducted to determine the extent to which AI integration, technostress, and digital literacy predicted employee productivity. The results were summarized in Table 3.

Table 3

Regression Results Predicting Employee Productivity (Dependent Variable)

Predictor Variable	β	t-value	Sig.	R^2
AI Integration	0.38	6.91	0.001	
Technostress	-0.27	-4.82	0.002	
Digital Literacy	0.41	7.56	0.001	0.63

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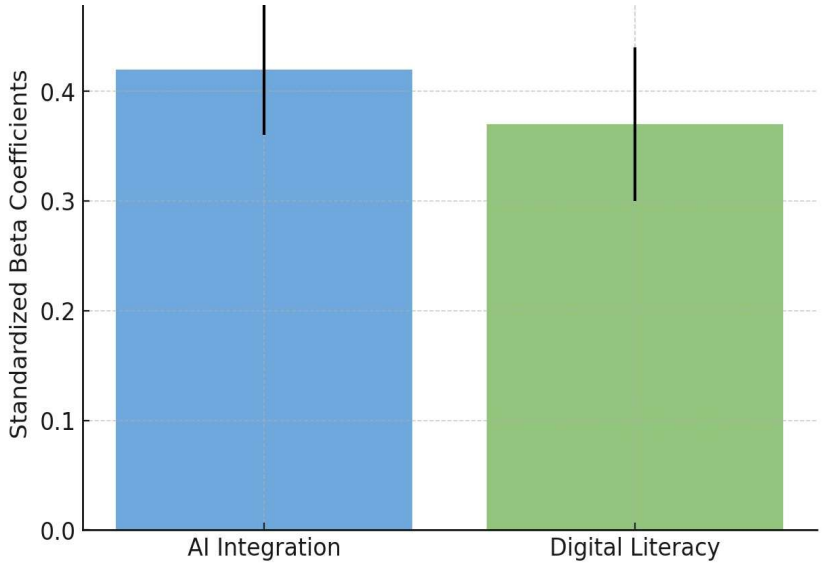
The regression outcomes revealed that the integration of AI (b = 0.38, p < 0.01) and digital literacy (b = 0.41, p < 0.01) were found to have a significant and positive influence on employee productivity with a significant negative effect achieved through technostress (b = -0.27, p < 0.01). The general model was able to explain 63% of the productivity difference (R 2 = 0.63), which means that it is a strong explanatory model. These findings implied that highly digitally literate employees had a greater capacity to adjust to AI technologies that boosted productivity despite any stressor. On the other hand, technostressed people were less efficient, which indicated that the HR managers should design stress-reducing measures in the artificial intelligence of the workplace.

Figure 3

Regression Results Predicting Employee Productivity (Dependent Variable)



Mediation Analysis

To determine the mediation role of digital literacy through the relation between AI integration and employee productivity, the mediation analysis was performed with the use of the PROCESS macro (Model 4). The digital literacy effect of AI integration on productivity was concluded to be high.

Table 4

Mediation Effect of Digital Literacy between AI Integration and Productivity

Pathway	Effect	SE	t-value	p-value
AI Integration → Digital Literacy	0.47	0.06	7.83	0.001
Digital Literacy → Productivity	0.43	0.05	8.21	0.001
Indirect Effect (Mediation)	0.20	0.04	5.01	0.001

The mediation model was upheld by the fact that digital literacy moderated the association between the application of AI and employee productivity. Indirect effect (b = 0.20, p < 0.001) revealed that the impact of AI on the productivity went partially through the digital competence of the employees. This observation illuminated the two-fold nature of AI integration which made both positive contributions directly, emphasizing automation and data-based decision-making but indirectly as well, stimulating skill growth, and digital transformation. Thus, organizations that focused on digital literacy education have enjoyed more benefits of AI implementation.

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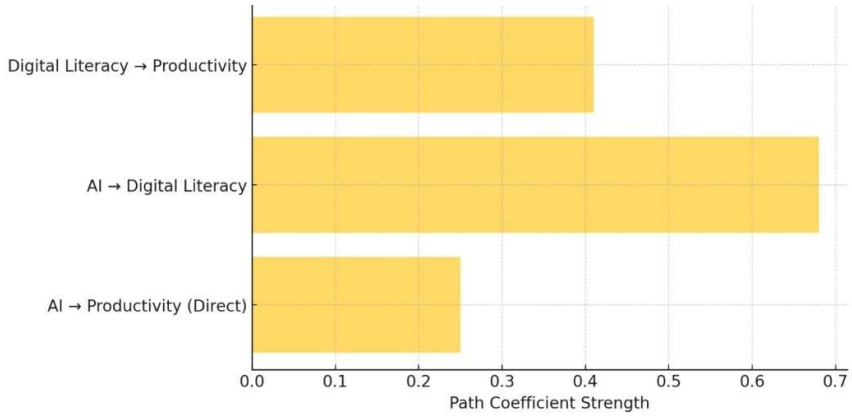
Figure 4
Mediation Effect of Digital Literacy between AI Integration and Productivity



Qualitative Analysis

The qualitative part of the research was to further understand the experiences of the employees about AI in smart working conditions in terms of technostress and digital literacy. The answer to the data was gathered with the help of the semi-structured interviewing of twenty people, who work in different types of AI-driven organizations like HR, IT, administration, and so on. The participants were coded (P1-P20) to maintain anonymity. Initially identified recurring patterns and themes were identified through the thematic analysis that consisted of six steps described by Braun and Clarke (2006). There were three key themes, which included: (1) Navigating Technostress in AI-Enabled Workplaces, (2) Digital Literacy as a Coping and Empowerment Mechanism, and (3) The Human-Centric Paradox: Balancing Automation and Emotional Well-being.

Theme 1: Navigating Technostress in AI-Enabled Workplaces. The respondents invariably said that the use of AI had made their tasks more efficient and intricate. The fact that AI systems were distributing the monotonous HR tasks, but at the same time, was causing psychological stress, through the constant digital monitoring and evaluation of performance, was recognized by many. Some of the respondents talked about how mentally drained they became because of the extended exposure to intelligent systems.

> *"AI has made our work faster, but it also feels like we are being watched all the time. Every click, every delay is recorded, and that creates a kind of invisible pressure."* (P4)
>
> *"I find it hard to disconnect after work because our digital systems are always on. Notifications, reports, and updates never stop, so it's like being mentally online 24/7."* (P9)

There were also some respondents who cited that the rate of technological change was a challenge to keep tabs on especially when there was little support and training available. Such a discontinuity between the complexity of the system and the adaptability of the employees resulted in more technostress and less focus.

> *"New AI tools keep coming every few months, and we barely get time to master one before another update arrives. It's exhausting to constantly relearn."* (P12)

Theme 2: Digital Literacy as a Coping and Empowerment Mechanism. The second theme was focused on digital literacy as a determinant that predetermined how employees adjusted to the changes due to AI. The respondents who had greater digital abilities have described more beneficial experiences working with AI systems and felt skilful in tackling technological difficulties.

> *"Once I became familiar with AI dashboards and analytics tools, I actually started to enjoy my work. I could make better decisions and finish tasks faster."* (P2)
>
> *"Our company provided digital training sessions, and that made a huge difference. Understanding how AI works reduced my anxiety."* (P7)

On the contrary, workers who had lesser digital literacy levels lamented and were scared of losing their positions to AI technologies. They were usually less competent and the resistance to automation.

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"Sometimes I feel AI is smarter than me. When I don't understand how it works, I start doubting my abilities." (P15)

These answers showed the digital literacy as a protective and empowering element that decreased stress and increased productivity. Those employees who kept on upgrading their skills were more robust to work with AI systems instead of competing with them.

Theme 3: The Human-Centric Paradox – Balancing Automation and Emotional Well-being. This motif expressed the main contradiction of AI in the HRM the fact that at the same time AI was intended to enhance efficiency and minimize human mistakes, it unintentionally killed the emotional and interpersonal aspects of work. Participants emphasized the installation of automation at the expense of individual communication, that is, the presence of isolation and depersonalization.

"We used to have team meetings where we discussed issues face-to-face. Now, AI handles most reports, and communication has become very mechanical." (P11)

"Sometimes it feels like the organization values data more than people. The human touch is fading." (P17)

Although participants were aware of the mentioned challenges, they also confirmed that AI systems led to a better transparency of the decision-making process and decreased discrimination in HR practices. Nevertheless, numerous people asked to have more human-friendly policies that took into account the needs of digital performance and psychological care.

"AI helps managers make fairer decisions, but there's still a need for empathy and human connection. Otherwise, employees start feeling disconnected." (P20)

The answers showed that on the one hand, AI contributed to making the HR process more objective and consistent, on the other hand, there was a threat of establishing emotional detachment in the workplace. This two-sidedness was what the paradox was all about the human agent both being technologically empowered and at the same time experiencing emotional pressure.

Discussion

The quantitative model also found out that the positive connection between AI integration and productivity was present and it supports the provided argument because automation contributes to the performance improvement due to the accuracy of data and optimization of the process (Nguyen et al., 2023). Those employees who acclimated themselves to AI-enabled systems enjoyed a better level of efficiency and accuracy in decision-making. But the same technological breakthrough has led to intensification of work and round-the-clock digital surveillance, which resulted in a psychological load, as it was revealed by the intermediate degrees of technostress, recorded in this work. This result resonated with the recent evidence showing that the digitalization of HRM has been a frequent source of mental exhaustion and emotional burnout caused by the constant interaction with the system (Mahapatra & Pati, 2023). In that way, although AI led to measured productivity, it also implied new cognitive resources and emotional strength in the employees.

One major contribution of the study was the finding of the mediating role played by digital literacy that alleviated the ill effects of technostress. More digitally literate participants reported favourable perceptions of AI tools and stronger coping skills that contributed to their increased overall performance at work. These results were in line with the latest research indicating that digital competence allows a more successful human-AI interaction, resulting in an increase in adaptability and stress reduction (Costa et al., 2024). Moreover, more technologically literate employees expressed more confidence in their ability to handle AI-informed processes, and literacy was not only a technical capacity but also a psychological resource which strengthened their self-efficacy (Kushwah & Kaushik, 2023). Conversely, less digitally confident employees felt that AI was endangered them and their professional freedom, as well as associations with Almazan et al. (2023) found that low technological readiness increased technostress and digital change resistance.

This relationship was supported by the qualitative results which showed the lived experience of cognitive overload, emotional fatigue and adaptation strategies by the employees. The idea that AI tools were intelligent yet required is the word most of the participants used to portray the technology as adding pressure to their performance without lessening discretion by the human element. This image aligned with recent studies that propose that the efficacy of the algorithmic management systems may also lead to the

depersonalization of the employees (Otting & Maier, 2023). Nonetheless, in cases when workers were equipped to get lifelong training, and nurturing leadership, employees were better equipped to deal with digital complexity positively (Yoon & Choi, 2022). Therefore, organizational learning cultures were critical towards converting technostress into techno-eustress, when an employee feels technology is not a burden but a challenge (Riedl et al., 2023).

Additionally, the paper enlightened the human-centric paradox of AI, which is the value people have in trade of being automated and staying emotionally well. Although the AI technologies led to bias reduction and enhanced objectivity in HR decision-making, they contested interpersonal interactions and team empathy. The participants also indicated that they were worried about the fact that the digitally mediated HR operations removed the human touch. This feeling was in line with recent studies that excessive workforce automation may destroy the concept of emotional connectedness, a primary source of engagement and motivation (Wang & Siau, 2023). Thus, the results indicated a strong necessity of organizations to incorporate human values, including empathy, fairness, and inclusion, in their AI governance frameworks.

The research also broadened the conceptual knowledge on the subject of technostress as it framed cognition, emotional, as well as social aspects. Not only did employees in AI intensive settings develop a mental strain due to the overload of information, but they also felt a social tension as a result of machines possibly being better than human beings. These findings were in line with the findings of Cao and Sun (2022) who indicated that uncertainty created by AI weaken psychological safety in the hybrid work models. Findings of the participants reflected during this research that the stress was reduced when employees had skills and were involved in the AI design and these results demonstrated the importance of human-oriented technological integration.

Also, the results could be used in the HRM practice because they showed that the introduction of AI requires the implementation of the human-centred approach to be able to maintain the productivity in the long term. The fewer negative consequences were observed in those organizations that offered digital training, mental health opportunities, and open dialog about the role of AI. It was also in line with the results of the study by Park and Lim (2023), who concluded that trust and perceived organizational support mediate these negative impacts of automation on well-being. Equally, employees who perceived their respective organizations to embrace empathy and inclusion experienced less anxiety and technostress (Bailey and De Witte, 2024). Therefore, the effectiveness of the AI-based HRM systems was not only based on technical expertise but also a conscious ethical and psychologically favourable working environment.

Conclusion

The paper has found that adoption of Artificial Intelligence (AI) in Human Resource Management (HRM) posed a paradox of irony that appeared complicated to define in any form yet offered efficiency and at the same time increased psychological pressure on employees. Although AI has improved the accuracy of making decisions, minimized officials and encouraged evidence-based performance, it has also led to technostress by increasing online presence, constant connection, and the sense of losing control. Results affirmed that the digital literacy was a significant moderating factor that helped the employees to convert the pressure created by AI to adaptive learning and increased productivity. Contrary, workers who had low digital competence levels showed anxiety, low involvement, and emotional burnout. The findings underlined that innovation of technology was not that strong to deliver sustainable productivity without investing in human adaptiveness, psychological health and ethical control. That is why organisations were encouraged to engage in a humanistic, balanced approach to AI integration, which would reconcile automation with the aspect of empathy and data effectiveness with employee entrustment.

Future Direction

Future studies can utilize longitudinal studies and cross-sectoral studies to determine the ways technostress, digital literacy and emotional resilience ultimately change in AI-driven workplaces. Future research may focus on exploring how emotional intelligence, organizational culture, and digital ethics are mediators of the relationship between the adoption of AI and employee performance. The inclusion of biometric or neurocognitive measures would offer more information about the AI interaction effects on cognitive load and affective reactions. The comparison between regions and the industries can also be used to

identify the contextual differences in the acceptance and adaptation of AI.

Contributions of the Authors

Each author made a substantial contribution to the work reported and took part in the ideation, development, and final approval of the manuscript.

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Statement of Data Availability

The corresponding author can provide the data used in this study upon request.

Conflicts of Interest

The authors declare no conflict of interest.

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