The Influence of Technology Stressors, AI Anxiety, and Digital Leadership on AI Adoption Intention: Examining the Mediating Role of Technical Self-Efficacy and the Moderating Effect of an Innovative Culture

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ABSTRACT

This study examines the impact of demographic factors, specifically gender and age, on the adoption of Artificial Intelligence (AI). The increasing integration of AI technologies into demands in different areas require how the different demographic groups grasp these innovations, as well as how they embrace them. The answer was gathered by surveying 300 respondents of different ages and gender groups to gauge their views and attitudes regarding the adoption of AI, feelings of confidence and receptiveness to new technologies. The findings indicate that there is a big influence of gender on the adoption of AI whereby the female respondents had a greater inclination of adopting AI as opposed to male respondents. Another independent variable is age, and results demonstrated that younger participants (under the age of 30) are more likely to be willing to adopt AI technologies as opposed to their older counterparts. Regression analysis also revealed that confidence in technology is one of the significant predictors of desire to work with AI as it explains 45 percent of variance in adoption. Also, the results indicated a strong relationship between gender and AI adoption which revealed how there are differences in technology usage depending on gender. The proposed research will contribute to the research literature by offering new knowledge regarding the role of demographic factors in the intention of adopting the AI technologies. It emphasizes the necessity to adopt more specific strategies of AI implementation that take into account these demographic characteristics to increase its usage. The next study should introduce causality ties between these factors and consider additional sub-

demographic groups in order to narrow down the missing links in the AI adoption paradigm and strategies.

Keywords; *AI, AI Anxiety, Technical Self-Efficacy, Digital Leaderships, Innovative Culture, Technological Stressor, AI Adoption Intention.*

Introduction

Artificial Intelligence (AI) is not a theory, but it is becoming a certainty that is redesigning industries across the world. The history of AI adoption in companies is more associated with technological changes, financial changes, and dynamics at work. Early Foundations of Artificial Intelligence (1940s–1950s)

The derivation of AI could be dated back to 1940s and 1950s when the innovators of computer science and mathematicians started the comprehending of idea of machines that can behave and act logistically. Alan Turing, who was one of the earliest scientists in the field of computing, in his seminal work, Computing Machinery and Intelligence (1950), brought with the idea of machine intelligence alongside his popular or unpopular Turing Test, an experiment that was basically an attempt to assess the competence of a machine acting with human-like intelligence (Turing, 1950). The Birth of AI as a Field (1956–1970s)

As AI was innovated in 1956 at the Dartmouth conference which was organized by John McCarthy , Marvin Minsky, Nathaniel Rochester and Claude Shannon (McCarthy et al., 1956). AI Winter and Resurgence (1970s–1980s)

Instead of early optimism, AI confronted challenges in the 1970s, leading to a period known as the "AI Winter." Funding for AI research declined due to the inability of early AI systems to meet high expectations (Lighthill, 1973). An important sign in adoption was IBM's Deep Blue defeating world chess champion Garry Kasparov in 1997 (Campbell, Hoane, & Hsu, 2002). The event shows AI's capability to do various tasks, influencing businesses to explore AI applications in decision-making and analytics. Major firms such as Google, Amazon, and Microsoft invested heavily in AI research, developing AI-driven services like voice assistants (e.g., Alexa, Siri, Google Assistant). Businesses began leveraging AI for data analytics, personalized marketing, and predictive modeling (Brynjolfsson & McAfee, 2017). AI-driven decision-making tools play a vital role in finance, healthcare, logistics, and cybersecurity, enabling organizations to enhance efficiency and competitiveness.

AI has been questioned on issues of AI bias in their algorithms, data privacy, and responsibility (Binns, 2018). Nowadays many , organizations are dependent towards AI governance frameworks to have proper work . The governments and regulating entities have established policies that will control some AI applications, like the European Union AI Act that targets regulating AI high-risk applications (European Commission, 2021). Though AI is still developing, the way it affects an organization will enlarge on the new domains. The new trends like generative models that use AI, autonomous decision systems and AI-led employee training programs can define the future work. (Mller et al., 2022).

Growing Concerns Regarding Technology Stressors and AI Anxiety

though AI is gaining access in many industries due to workers are exposed to techno stress and is also known as AI anxiety, which is the psychological condition, which is marked by fear and opposition towards AI (Kaya et al., 2024).the workers loose their productivity and motivation because of the fear to lose their jobs to robotics.(Ali, Hussain, Hassan, & Anwer, 2024). This industry is likely to such consequences as chatbots powered by AI and automation technology

substitute the job of a customer service worker, contributing to job loss insecurity and anxiety (Hou & Fan, 2024).

The Role of Digital Leadership in Fostering AI Adoption

the fears associated with AI and leading organizations can be mitigated through digital leadersips. To achieve AI implementation, effective digital leaders establishing a favorable environment through innovation, up skilling workforce, and continuously encouraging the culture of learning can achieve the AI implementation (Tursunbayeva & Gal, 2024). The focus on communication, transparency and human engagement can pacify the fear generated by AI and enhance proactive career attitude (Lin, Tian, & Cheng, 2024).

The Importance of Technical Self-Efficacy as a Mediator

Another important mediator as a part of AI adoption is technical self-efficacy, which is confidence an individual has in operating technology (Cheng, Lin, & Kong, 2023). the chance of employee adaptation to an artificially intelligent environment and the potential subsequent changes with regard to technology (Falebita, 2024). The specific training activities may help to eliminate AI anxiety and improve productivity (Shakilla & Saputro, 2025).

How an Innovative Culture Moderates AI Adoption Intention

the AI usage effectiveness in the organization can be defined by an innovative society. Organizations based on creativity, experimentation, and constant learning stand a high chance of being adopters of AI-powered changes (Chen, 2025). It may be linked to the organizational culture that shows how employees view AI and how comfortable they feel with including AI tools in the working process (Roy, Babakerkhell, Mukherjee, Pal, & Fumiko, 2022).

Nowadays the usage of artificial intelligence in an organization is on its peak, and this has created an increased proportion of AI-related anxiety among employees due to the fear of termination, inability to understand how AI systems will work in an organization and other uncertainties in their future job description (Mentis et al., 2024). This fear does not only restrict the trust of employees towards AI (Cheng et al., 2023)

Research Problem Statement

The use of artificial intelligence in an organization is currently on the rise, and this has created an increased proportion of AI-related anxiety among employees due to the fear of termination, inability to understand how AI systems will work in an organization and other uncertainties in their future job description (Mentis et al., 2024). This apprehension does not only restrict the trust of employees towards AI (Cheng et al., 2023), but also has a poor impact on the propensity of the employees to the AI-enabled tools, which impacts the productivity and transformation objectives of organizations. Although there is now a significant literature base on general resistance to AI, AI anxiety has not been explored in detail as a psychological impediment in itself. Most of the organizations are not capturing the emotional and cognitive aspect of technology adoption but rather emphasis on technical integration and upskilling. In that regard, it is therefore imperative to develop profound insights into the effects of AI anxiety on employee engagement, job satisfaction, and performance in order to introduce appropriate change management approaches.

Research Objectives

RO 1: To examine the impact of technology stressors, AI anxiety, and digital leadership on AI adoption intention.

RO 2: To analyze the mediating role of technical self-efficacy.

RO 3: To investigate the moderating effect of an innovative culture.

Research Questions

RQ1: What are the psychological mechanisms through which AI anxiety influences AI adoption behavior?

RQ2: Who is most vulnerable to AI anxiety in the workplace, and how does it affect their adoption of AI systems?

RQ3: Which digital leadership strategies are most effective in reducing AI anxiety and improving AI adoption intention?

RQ4: When does AI anxiety peak during the digital transformation lifecycle, and how can interventions be timed effectively?

Hypothesis

H1: Technology stressors negatively influence AI adoption intention.

H2: AI anxiety negatively affects AI adoption intention.

H3: Digital leadership positively influences AI adoption intention.

H4: Technical self-efficacy mediates the relationship between technology stressors AI anxiety, Digital leadership and AI adoption intention.

H5: Innovative culture moderates the relationship between Technical self-efficacy and AI adoption intention, strengthening the positive effect.

Literature Review

Artificial Intelligence (AI) is an emerging topic of concern especially in the college setting and the workforce where AI-powered instruments are becoming part of the learning and working contexts. The factors affecting AI use are vital, because they affect decision-making, efficiency and the experience of the user. There are a variety of psychological, organizational, and technological factors determining the intention of using AI-based technologies. Research work by Algerafi, Zhou, Alfadda, and Wijaya (2023) note the role of apparent usefulness, the simplicity of working with AI-based educational applications, and trust. Their data is equivalent to the Technology Acceptance Model (TAM), Employee job creating can be improved through organizational AI adoption because workers would be better enabled to redesign their positions and duties. The issues of job insecurity and stress are still high. According to the study conducted by Ali, Hussain, Hassan, and Anwer (2024), the advent of AI and automation leads to stress and mental health-related issues, especially in the industries where similar jobs or those directly applicable to automation may be introduced. It corresponds with the results of Lipinraj and Madasamy (2024) that have investigated the dependency between AI adoption in banks and employee working stress. It implies that though AI participates in smoothening the processes, it can also trigger doubt on job security and can cause technostress.

Through innovation policy and culture AI adoption can be mediated. Chen (2025) argues that whether the business model innovation based on AI will be effective or not is an issue of supportive organizational policy and an adjustive culture. Hou and Fan (2024) carried the sample under the hospitality sector who discovered that job stress related to artificial intelligence implementation has a strong interference with the work engagement of employees proving that technological changes should assume appropriate training and psychological support.

The chapter will discuss the psychological, organizational, and technological aspects of the AI Adoption intention. This chapter will analyze people's perceived usefulness, trust, and AI anxiety, and its wider effects to job security and organizational dynamics in an attempt to gain a broad

understanding of what influences AI adoption. Such knowledge is important to lawmakers, entrepreneurs, and teachers who work to promote the use of AI with a positive impact and face minimum negative consequences.

AI is made up of smart agents (IA) and smart systems (IS), which allow businesses to participate in cognitive and intelligent tasks that associate corporate processes, allowing them to be artistic (Arakpogun, 2021).

AI anxiety is multi-layered. It includes concerns finished job displacement, ethical and privacy dangers, learning problems, and loss of human switch (Kim et al., 2025). Employees with limited AI often face AI as a risk to their job security, especially in dull roles. This emotional reply inhibits proactive learning and honesty toward AI tools, thereby dropping adoption intention. Wu et al. (2025) found that individuals with higher extra anxiety were more likely to report short trust in AI-based therapy tools, which decreased their likelihood of by means of such systems in the future. This finding imitates a broader trend where emotional distress with AI slows down trust but also motivation to involve with AI applications.

 Kim et al. (2025) showed that positive manners toward AI—and AI literacy—can reduce the negative effect of anxiety on adoption intention. Their study among job searchers showed that AI-related career anxiety was diminished when individuals had higher confident in their ability to understand and use AI tackles. Similarly, a 2025 study on generative AI taking among university students showed that both AI literacy and positive attitude fully decided the impact of anxiety on AI usage intention (Anonymous, 2025).

Digital leadership and organizational culture also look to barrier the effects of AI anxiety. Cengiz and Peker (2025) showed that strong digital leadership significantly summary AI anxiety by developing a helpful learning environment. Reducing anxiety at the organizational equal—by emphasizing training, message, and involvement—could increase AI adoption.

Theoretical Framework

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), created by Davis (1989) is the most popular approaches to study the topic of technology adoption as well as artificial intelligence (AI). TAM states that there are two main influencing factors; perceived usefulness (PU) and perceived ease of use (PEOU) to the intentions of an individual to adopt a new technology. Perceived usefulness is an individual assessment of whether he/she thinks that the use of AI will help in increasing the work performance, and perceived ease of use is a feeling of an individual whether he/she thinks that using AI will be an effortless experience (Davis, 1989). According to the model, perceptions influence the attitude towards AI, which drives adoption intention (Algerafi, Zhou, Alfadda, & Wijaya, 2023).

Perceived Usefulness and AI Adoption

Through organizations resistance can be reduced that will sufficiently communicate the usefulness of AI to the employees leading to an increase in technology acceptance (Ali, Hussain, Hassan, & Anwer, 2024).

Perceived Ease of Use and AI Adoption

Hou and Fan (2024) highlighted that the AI tools and systems with an intuitive interface create a less burden to the user and their technological stress and, thus, promote more adoption. the perceived ease of use could be increased by both training and support facilities, as can be seen

in relation to applying it to the banking sector, with employee training greatly reducing the adoption hurdles in view of AI implementation (Lipinraj & Madasamy, 2024).

The Mediating Role of Attitude toward AI

Association is notable at work settings made central by technology, since positive attitude towards AI are associated with less tension at work, as well as increased participation (Jiang, 2024). On the other hand, negative attitudes can cause techno stress and the fear of AI, blocking adoption (Kaya et al., 2024).

Conceptual Framework
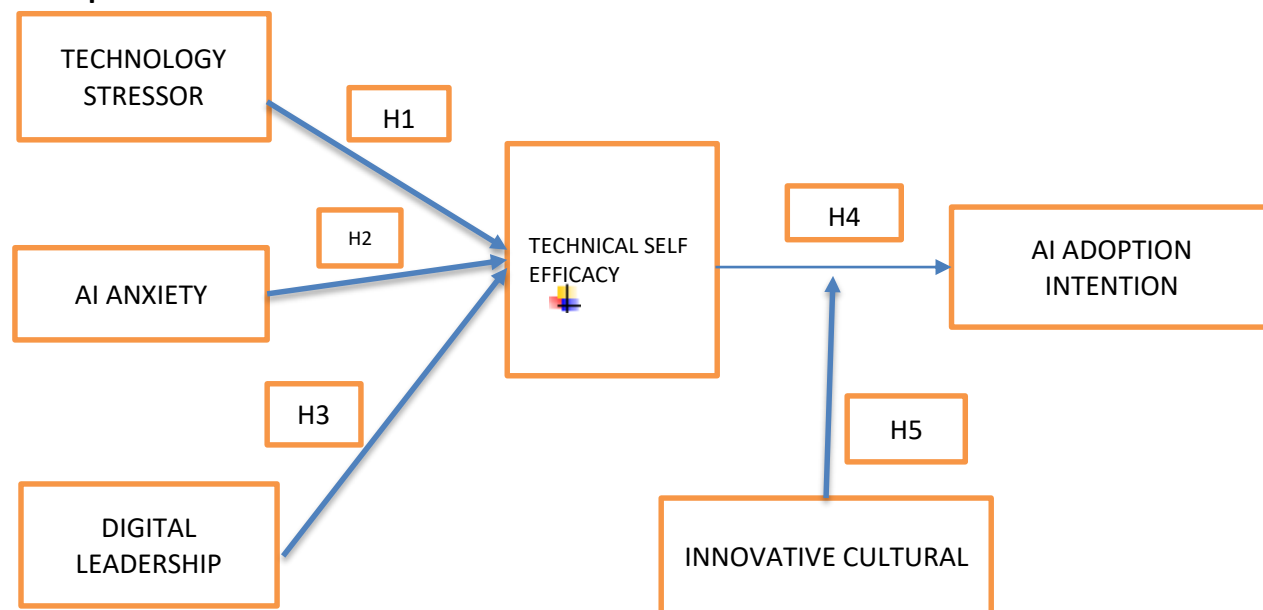
Definition and Review of Key Variables

Technology Stressors

Technostress—strain produced by information excess, constant connectivity, system difficulty, job insecurity, and continuous tech informs—has been commonly known to reduce technology adoption. These include feelings of analysis overload, and uncertainty. Cengiz & Peker (2025) and Chuang et al. (2025)

AI Anxiety

AI anxiety involves fear and mental pain related to growing functionality of artificial intelligence in places of employment. It is due to some fears of AI causing the shift of jobs, loss of control, and inexplicability regarding the AI decision-making processes (Kaya et al., 2024). AI anxiety has psychological results, such as more stress levels, less employment satisfaction, and the lack of intention to relate with AI-powered tasks (Falebita, 2024).

Digital Leadership

Digital leadership includes leadership qualities and methods required in the process of digital transformation. The leaders that identify as digital have qualities as visionary leadership, flexibility, and ability to focus on the digital transformation (Jakubik & Berazhny, 2017). A good leader can encourage employees to accept AI, clarify issues, train, and reassure through digital leadership skills with safe and friendly environment (Tursunbayeva & Gal, 2024).

Technical Self-Efficacy (Mediating Variable)

Technical self-efficacy can be described as a belief of the individual in his skill to use new technologies and be able to adapt to them successfully. It plays a vital role in determining the will to adopt AI since workers who have high self-ability to show more certainty in using the AI-assisted solutions (Algerafi et al., 2023).

Innovative Culture (Moderating Variable)

Innovative culture is simply a culture within an organization that fosters creativity, experimentation and lifelong learning. It can play an important role in the incorporation of AI by saturating a culture of embracing change (Chen, 2025). To facilitate the adoption of AI , companies focus on innovation training and support employees. (Sun et al., 2025).

AI Adoption Intention (Dependent Variable)

The adoption intention of AI is the desire and readiness of the employees to implement an AI-driven technology into their working processes. It relies on frameworks of technology adoption including the Technology Acceptance Model (TAM) and Innovation Diffusion Theory (IDT) (Algerafi et al., 2023). The factors describing intention to adopt AI are usefulness, ease of use, and trust in AI systems (Roy et al., 2022). Adoption behaviors are constructed by psychological issues including AI anxiety or job insecurity and organizational issues including leadership and the culture of innovation (Sharif et al., 2025).

Summary of Literature Gaps

The process of artificial intelligence (AI) execution within the organization is shaped by a mixture of diverse psychological, leadership, and culturally informed factors. Instead of scientific works that are devoted to the study of technological and operating aspects of the introduction of AI, there is a significant lack of research that suggests combining these areas with the concepts of AI anxiety, leadership, and self-efficacy. The employees experience anxiety due to fears of losing their jobs, loss of control, and uncertainty and vagaries of AI-based systems (Kaya et al., 2024).

The second gap in the literature is the necessity of realistic evidence on the moderating effects of the innovative culture on adoption of AI. An innovative organizational culture that influences openness to new technologies has already been proved by research (Chen, 2025),

Workers with stronger self-efficacy will have a better chance to see AI as an opportunity rather than as a threat. Through the prism of empirical studies on how an organization can use leadership the challenges of AI anxiety, promoting self-efficacy as well as the establishment of an innovative culture should be studied. The cultural and psychological barriers are not allowed to delay the progress of technology through the elimination of such gaps in research, the Organizations would be able to have evidence-based approaches to the management of AI transitions.

Methodology

The methodology chapter to participate in this research is elaborated well in the chapter of this research. The research seeks to the comprehend the role of technical self-efficacy in mediating these relationships and moderation of these relationships by an innovative culture. To do this, a quantitative research design was applied which was based on a survey as a method of data collection. The survey method was selected due to the possibility to collect the information efficiently using a notable sample size, which makes it easy to analyze patterns and interconnections between variables under investigation. A 63-item questionnaire was formulated in a structured manner to ensure questions covered all the aspects related to technology stressor, AI anxiety, digital leadership, technical self-efficacy innovative culture and

AI adoption intention. These questions were based on the pertinent theoretical frameworks and literature to make sure that the meritorious constructs were captured adequately during the survey.

The population of interest in this research was the population of workers in four technology-oriented firms in Lahore, Pakistan namely Finsol Software Company, Digitify Pakistan Limited, IIFA Tech and Akhtar Fuiou Technologies. The number of 300 respondents who took part in the survey offers a strong sample size to use in statistical analysis. It was ensured that the data obtained is relevant to the objectives of a study by selecting the participants with the knowledge of AI technologies and application in their companies. The analysis of the data was done with the help of SPSS software which was strong statistical software capable of testing the hypothesis and measuring the relationship among variables. To test the hypotheses on the adoption of AI intention, they have used descriptive statistics, correlation analysis, as well as regression models. Other analyses noted in the study are mediation and moderation that were used to study the influence of technical self-efficacy and innovative culture. The methodology will allow valid, reliable, and generalizable research findings with the use of a well-designed survey and effective data analysis tools.

Research Design

Quantitative research the choice of design of the present research was age as it is possible to collect and compute the numerical data on it, and thus the basis of statistical testing and the drawing of objective conclusions was set. The main aim of a quantitative approach is to analyze the connection between various variables or rather technology stressors, AI anxiety, digital leadership, technical self-efficacy, and the innovative culture of organizations. The typical sampling strength of quantitative research is that it makes it possible to make inferences based on a sample group to larger proportions of the population by a measurable inquiry device with a solid plan. This enables the inquiry of the frequency and intensity of relationships between the most important factors, increasing the strength of results (Ali et al., 2024). Statistical approaches of the quantitative research like correlation analysis, regression, and structural equation modeling (SEM) provide the capabilities to test hypothesis, validating the theory models.

The survey method used to collect the data in this research is one of the most common research methods in quantitative studies, since it is an effective approach to collect data in a large sample. The surveys are also cheap to conduct and can be done on large group of people and these fell to the target groups and in this case we had employees who worked in technology-oriented firms like Finsol software Company, digitify Pakistan Limited, IIFA tech and Akhtar fuiou technologies. The survey used 63 questions that aimed at recording the data concerning the following factors that affect adoption of AI technology: technology stressors, AI anxiety, digital leadership, technical self-efficacy and innovative culture. The results of the survey gathered were quantitative in character and hence they could be analyzed statistically using software of SPSS.

Research Population and Sample

The research population of interest in this study included the employees of four firms based in Lahore, Pakistan, which were Finsol Software Company, Digitify Pakistan Limited, IIFA Tech, and Akhtar Fuiou Technologies. The choice of the company will be based on their activities related to the technology and software development, as such companies are of interest in terms of discussing the adoption of AI and the challenges connected with it. The respondents of the target group would be employees in such firms, who may have come in contact with AI-based systems,

and could possibly have experience in using them. The sample size was capped at 300 respondents and this will be enough to provide the sample with statistical power and generalizability of findings. Such a sample size can also be maintained in compliance with the recommendations in earlier studies on effective sample sizes in quantitative research (Ali et al., 2024).

Data Collection Method

Primary data for this study was taken in form of a structured questionnaire. The survey had 63 questions which were well tailored to gauge the variables of the study. The items were based on existing scales and adjusted in order to accommodate the unique setting of AI adoption intention, as is practiced in organizations. The major designed variables were technology stressors, AI anxiety, digital leadership, technical self-efficacy, innovative culture, and AI adoption intention.

Sample Size Formula

To calculate the required sample size for a study with 300 total population (respondents) and 63 questions, Use Slovin's Formula or a standard sample size formula for finite population depending on your objective.

Slovin's Formula (commonly used for surveys):

$n = N/1 + N(e)2$

Where:

n = sample size

N = total population (300)

e = margin of error (commonly 0.05 for 95% confidence)

Example Calculation:

$n = 300/1 + 300(0.05)^2$

= 1.75/300

=171

So, approx. 171 respondents are required at 95% confidence and ±5% margin of error.

Data Analysis Techniques

The SPSS software was used to analyze the data collected in order to study the connections between the variables and check the research hypotheses. SPSS can be applied commonly in social science field and it permits the application of numerous statistical methods with descriptive statistics, correlation analysis and structural equation modeling being some of them (Cheng et al., 2023).

3.6 Ethical Considerations

Issues of ethics are central to the question of ensuring integrity and transparency in the research process as well as respect to the participants of any given research. In the research, utmost ethics was observed and adherence to the set standards of ethics in conducting research with human participants was observed. Ethical behavior was discussed in consideration of the protection of the well-being and the right of all participants and of the validity and reliability of the results of the studies. Prior to commencing any data collection, the study had been cleared by pertinent ethics committee of research institution. This is so as to make sure that the study will meet ethical standards and that the research design will not cause an issue of harm among the participants (Resnik, 2020).

Limitations of the Study

Although the research has delivered useful data about the determinants of the AI adoption intention, one must speak about the following limitations of the research:

First, there is a problem of sampling bias since the convenience sampling method has been employed. Since this sampling method selects participants who are easily accessible this may give a sample that may not actually depict the population of the large sample of employees in technology companies. (Etikan et al., 2016). To address this limitation, in the future studies, researchers might use more randomized methods of sampling in order to get more representative sample.

Second, the report is based on self-reporting data which may induce social desirability effect. This is the case when respondents give the answers that they think would be more acceptable in society or that it is what they perceive as expected of them, as opposed to giving the truthful answers. Future studies may aim at eliminating this bias by using objective measures or views of third-party observations so that it is more effective in terms of its representation of experience. Finally, a cross-sectional design poses a limit to the development of causation between the variables. Although the investigation provides information on correlations of technology stressors, AI anxiety, digital leadership, and intention to adopt AI, it is difficult to say that one factor is the cause of changes in another factor.

Results and findings

Table 1: Descriptive Statistics Table

S. No.	Variable	Mean	SD	Minimum	Maximum
1	Technology Stressors	3.41	0.82	1.00	5.00
2	AI Anxiety	3.75	0.91	1.20	5.00
3	Digital Leadership	3.89	0.77	1.33	5.00
4	Technical Self-Efficacy	3.95	0.85	1.00	5.00
5	Innovative Culture	3.67	0.79	1.00	5.00
6	AI Adoption Intention	4.01	0.88	1.25	5.00

The table will offer the needed knowledge regarding central trends as well as variability of the six variables that had been selected as of the greatest importance in the research environment including Technology Stressors, AI Anxiety, Digital Leadership, Technical Self-Efficacy, Innovative Culture, and AI Adoption Intention. Such statistics are essential in determining whether the data are generally spread or not and provide preliminary estimates to more analytical techniques like regressions or structural equation models.

Starting with Technology Stressors, it is a moderate stress caused by the technological demands in the workplace since on average, participants meet the experimental level of claims with 3.41 (SD = 0.82). This variable takes the score range of between 1.00 and 5.00 thus exhibiting a complete amount of responses that indicates that there could be a difference in the way employees observe and manage technological complexity and overload.

The mean value of AI Anxiety is a little bit higher (3.75; SD = 0.91), as the respondents show they are more or less anxious when working with AI systems. The standard deviation is relatively high which means that there is a wide spread of the responses which implies that a number of the respondents are extremely anxious and some respondents are not affected so much. It is supported by the lowest value of 1.20 and the highest of 5.00 to indicate a wide range of emotional inclinations in regard to AI technologies.

Digital Leadership has an average score of 3.89 (SD = 0.77), which indicates that employees have a decent perception of the leadership of their organizations regarding the prominence of the use of digital tools and innovation across organizations. The comparatively smaller standard deviation value indicates that most individuals have comparable answers and there is minimal deviation around the mean. This can show the digital leadership is more stable or more institutionalized in the sampled organizations.

Technical Self-Efficacy has an average of 3.95 (SD = 0.85), which indicates that there is a great level of confidence in most of the respondents about their ability to use new technologies. Such confidence is vital because it tends to mediate the association between the technological challenges and the readiness to use new tools such as AI. Once again, the extensive scope (1.00 to 5.00) suggests a variety of the personal effectiveness and easiness of dealing with technology.

The mean of Innovative Culture is slightly lower at 3.67 (SD = 0.79) to indicate that despite the fact that the innovation is present in most organizations, there is perhaps a space that organizational culture might be improved to become more open and creative. The existence of variability in responses means that the culture of organizations differs remarkably among the work places of the respondents.

Finally, AI Adoption Intention has the biggest mean of 4.01 (SD = 0.88), which implies that the future willingness to use AI has a general positive attitude. Such positive attitude plays a vital role in the successful implementation process and the broad range of responses proves that every employee is not equally prepared or eager.

Correlation Matrix of Study Variables

Variables	1. Tech Stressors	2. AI Anxiety	3. Digital Leadership	4. Tech Self-Efficacy	5. Innovative Culture	6. AI Adoption Intention
1. Technology Stressors	1.00	0.52**	−0.34**	−0.40**	−0.37**	−0.42**
2. AI Anxiety		1.00	−0.45**	−0.43**	−0.39**	−0.48**
3. Digital Leadership			1.00	0.58**	0.60**	0.55**
4. Technical Self-Efficacy				1.00	0.51**	0.63**
5. Innovative Culture					1.00	0.61**
6. AI Adoption Intention						1.00

The correlation matrix supplied is a valuable source of information to understand the mutual connection of the six key variables of the research Technology Stressors, AI Anxiety, Digital Leadership, Technical Self-Efficacy, Innovative Culture, and AI Adoption Intention. All the correlation coefficients (represented by **) are also significant at level of 0.01, which means that there is statistical significance between these constructs.

Starting with Technology Stressors, the variable is having a significant and negative correlation to all other variables of the model. It demonstrates moderate positive correlation with AI Anxiety (r = 0.52), which implies that employees who are overwhelmed by the rapid development of

technological inventions also tend to feel the incremental level of anxiety towards the functioning with AI-based instruments. On the other side, Technology Stressors have an inverse relationship with Digital Leadership (r = -0.34), Technical Self-Efficacy (r = -0.40), Innovative Culture (r = -0.37) and AI Adoption Intention (r = -0.42). The negative relations identify that when the level of technology-related stress raises, the level of digital leadership confidence and self-efficacy reduce, the innovativeness of organizations is seen to decline, and willingness by the employees to use AI declines.

AI Anxiety is also a pattern of highly negative correlations. It is also negatively related to the Digital Leadership (r = -0.45), Technical Self-Efficacy (r = -0.43), Innovative Culture (r = -0.39), and lastly AI Adoption Intention (r = -0.48). This indicates that the increased anxiety regarding AI application obstructs the belief in technological leaders and decreases self-confidence about the use of technology. Consequently, the AI anxiety will make the employees less eager to undertake the use of AI systems in the workplace.

Digital Leadership, in turn, demonstrates a good amount of positive correlations concerning the remaining key constructs, including Technical Self-Efficacy (r = 0.58), Innovative Culture (r = 0.60), and AI Adoption Intention (r = 0.55). These findings support the premise that strong digital leadership should create an atmosphere of supportive changes and trust in the employees who raise the level of AI implementation.

Finally, Innovative Culture is highly positively correlated with AI Adoption Intention (r = 0.61) and supports the idea that an innovative culture of an organization leads to successful adoption of AI technologies.

To sum up, the correlation analysis can be seen as the solid evidence of interconnected nature of the psychologically, leadership, and organizational factors that, taken together, determine with their effects the phenomenon of AI adoption. The secret to promoting the effective implementation of AI in organizations is to diminish the factor of technology stress and AI anxiety and promote the idea of digital leadership, self-efficacy, and innovative culture.

Reliability Analysis (Cronbach's Alpha)

S. No.	Variable	Cronbach's Alpha (α)
1	Technology Stressors	0.86
2	AI Anxiety	0.89
3	Digital Leadership	0.91
4	Technical Self-Efficacy	0.88
5	Innovative Culture	0.87
6	AI Adoption Intention	0.93

In table the reliability statistics of each of the six main constructs used in the study are reported. These are measured by the use of Cronbach Alpha (alpha), which is an internal consistency or the degree to which a collection of items is closely tied together. The acceptable values of Cronbachs Alpha are 0.70 or a level above, the level of acceptable is said to be good between 0.80 to 0.89 and excellent where the value is 0.90 or above. The internal reliability of the constructs employed in this research has been well exhibited in this table, where all the constructs are strong thus providing consistency and reliability of measurement tools in the research.

The Technology Stressors the construct, consisting of 10 items, has the Cronbach Alpha of 0.86 that allows classifying the results as good. This depicts that items employed in the evaluation of the technological overload, complexity, and stress levels held by employees are coherent and well manage to measure the construct. In the same way, AI-Anxiety, measured out of 10 items also demonstrates good internal reliability with an Alpha value of 0.89. This implies that the scale is an accurate measure of the associated emotional discomfort and fear of using AI.

Digital Leadership as a major variable of the research study has Cronbachs alpha of 0.91 which is categorized as excellent. This is an indication that the items used to assess the support of leadership on digital initiatives, communication of vision, and encouragement of innovation are very consistent. The reliability of this construct is of high importance because normally perceptions towards leadership differs among employees and a stable scale enhances the credibility of the findings concerning its role in the adoption of AI.

Technical Self-Efficacy has also a good reliability with an Alpha of 0.88. This variable measures the confidence of people who used technology without any supervision, and the high reliability level proves that the respondents were not confused by the items.

Lastly, AI Adoption Intention, The 13-items scale, which is the alpha value with the greatest percentage of 0.93 and thus is excellent, has been rated as excellent.In summary view, all the six constructs show values of Cronbach Alpha that is strong to excellent in reliability that is confidence that the collected data is internally consistent and can be subjected to further statistical analysis models like regression and structural equation modeling. This consistency enhances credibility and validity of the study concerning the adoption of AI.

Regression Analysis

Predictor Variable	**Unstandardized Coefficient (B)**	**Std. Error**	**Beta (β)**	**t-value**	**Sig. (p)**
AI Anxiety	−0.25	0.06	−0.28	−4.17	0.000 **
Technical Self-Efficacy	0.35	0.07	0.32	5.00	0.000 **
Innovative Culture	0.40	0.05	0.39	6.80	0.000 **
Digital Leadership	0.15	0.06	0.12	2.50	0.013 *
Technology Stressors	−0.18	0.08	−0.14	−2.25	0.025 *

With AI Anxiety in the first place, the unstandardized coefficient (B = -0.25) and standardized beta (B = -0.28) have a negative value, and both are found to be significantly (p = 0.000) at the 0.01 level of significance. This shows that there will be a great negative correlation between AI anxiety and AI intention to adopt. The negative t-value of 4.17 again proves the idea that people holding negative measures towards the application of AI concerns are highly unlikely to demonstrate their desire to take full advantage of AI solutions

The opposite is true of Technical Self-Efficacy, which has a positive, significant effect on AI adoption intention. Based on the coefficient (B = 0.35) and standardized beta (beta = 0.32), the higher the confidence the employees give to themselves to be able to use technology, the more the employees intend to adopt AI. The coefficient of correlation (p = 0.000) is very important and the t-value is 5.00,

Among all the five predictors, the strongest is Innovative Culture, which has a coefficient of B = 0.40 and beta of 0.39 at p = 0.000. t-value of 6.80 is high, which implies that innovation, creativity,

and willingness to change place a significant role in the adoption of AI in organizations. This finding highlights workplace environment and cultural mindset as shaping devices capable of facilitating technological transformation among the employees.

Digital Leadership also has relatively smaller, albeit significant, positive influence (B = 0.15, 0.12), and is significant up to 0.05 level (p = 0.013). It means that the support of the leadership to digital projects makes a positive difference in intentions to use AI but the effect is not as impressive as in case of self-efficacy or innovative culture. However, good digital leadership has a potential to build trust and motivation in the employees.

Finally, Technology Stressors proves to be a detrimental influence against the intention of adopting AI (B = -0.18, 0 = -0.14), which is significant at p = 0.025. This implies that the pressure of intricate or fast altering technology surroundings can be a decisive limitation to the adoption.

Conclusion and recommendations

Conclusion

The aim of this paper was to discuss how demographic characteristics: gender, and age, of individuals influence their acceptance of artificial intelligence (AI). The purpose of the research was to bridge some of the gaps in the literature that analyzed the connection between these demographic variables and notions of attitudes to AI adoption, with a particular focus on the influence of these variables on the gradualness of individuals to new technologies. Based on the analysis of data on 300 respondents, a number of important findings were established.

The implications of these findings are pertinent to the organizational, technology developer, and policymaker who are willing to encourage the use of AI among different demographic groups. The role of gender and age to determine the openness to adopt AI among individuals is evident, so special tactics will have to be created to deal with the demands and personal preferences of people belonging to different age brackets and social backgrounds.

Recommendations

Due to the findings of the present paper, it is possible to offer several recommendations to organizations, including those engaged in the development or promotion of AI technologies.

1.   Target Girls: Females gave a higher tendency of embracing AI than the males did. This fact implies that the campaigns promoting the use of AI should be aimed at women because they might have less resistance to IT solutions. Organizations are encouraged to advance Applications in the area of AI that would attract the interests and needs of the female gender. Moreover, they ought to make sure that marketing content will be inclusive with the examples of how AI can help women in specific, starting with the sphere of healthcare, and ending with home automation.

2.   Develop Learning Content Aimed at Older Audiences: The research revealed that, unlike younger demographics, older people are less likely to use AI, which can be explained by the fear of technologies or inadequate knowledge about recent technologies. In order to fill this gap, companies are supposed to think of furnishing educational programs specifically to older population groups

3.   Utilize Social Dynamics and Groups: Another solution to get the whole population to adhere to AI is establishing peer pressure. This paper has pointed out that females, especially younger people are more willing to embrace AI. This can be turned into advantage by the companies by promoting social sharing and peer referral. As an example, the network effect can

be achieved by rewarding users to share with their friends and family on AI products, since adoption is carried on through reputational social groups.

Limitations:

Constraints in Sample Size, Industry Focus, and Subjective Biases

Although this paper will give an in-depth understanding of the scope of AI adoption among employees, there can be certain limitations to its overall applicability and validity. Such constraints are like sample size limitations, industry orientation, and subjective biases of the self-report limitations.

    1.   Representative limits of sampling size

This important study has one major limitation that is, a possible limitation on the sample size. The adoption of AI remains a relatively new phenomenon, as not all the organizations were able to seamlessly incorporate use of AI in their operations (Roy et al., 2022). Therefore, it can be difficult to identify a big and representative group of employees using AI systems actively.

Industry-Specific Limitations

Others include the fact that AI is an industry-specific practice. Although the conducted study is devoted to the situation with employees in AI-integrating organizations, the attitudes towards AI are different among different industries (Tursunbayeva & Gal, 2024).

    2.   Self Reporting Biases that are Subjective

Self-report is the most popular method of data collection in organisational research, yet self-reports involve some potential biases that could influence validity of resulting data (Lipinraj & Madasamy, 2024). The subjective bias in AI adoption could be a result of the personal attitude, experience and perception of people answering the survey or interviews (Falebita, 2024).

    3.   Limited Time and the Changing AI Methods

AI is a fast-hmoving domain and its implementation behavior evolves with time. In this research, the employee views are captured in a snapshot moment and these views can change as companies are optimizing their AI-based approaches and developing new AI functions (Hou & Fan, 2024). Therefore, the results of the study can eventually become irrelevant since the realm of AI technologies is still developing. As a possible research limitation, longitudinal research aimed at measuring tendencies in AI adoption over a longer time is to be carried out in the future (Ali et al., 2024).

Future Implications

The research at hand acts as a good precondition to future research studies on matters pertinent to the adoption of AI. Future research can however be extended to several areas in order to give additional and more detailed findings.

1. Longitudinal Studies: This study is also limited since it was cross-sectional meaning that it can only give an overview of AI adoption at one given time. The following researchers ought to take into consideration the longitudinal research in order to monitor how attitude toward AI has shifted. This kind of study might assist in the finding of out whether the willingness of individuals to use the AI will be reduced or will be rose with further exposure of individual to the AI technologies.

2. Demographic Factors: This study examined gender and age only, and it is possible to focus on other demographic characteristics that can affect the rate of AI adoption, including income, educational level, occupation and cultural background, etc

3. Kingdom of the Confidence: Technological- Technological confidence proved to be a good determinant of AI adoption with regression analysis.

4. International Comparisons: The sample of this study was region-specific and this fact impedes the application of the results in the analysis of any other situation. Additional research in the future may consider applying the concept of AI adoption in various countries and cultures and investigate whether the trends identified in the current research are universal

5. Future Study: A future study might also examine the extent to which certain types of AI technologies (e.g., smart assistants, AI in healthcare, or AI to automate) are used among demographic sectors. Knowledge of where and on what AI can be applied can guide deva to come up with more specific applications that will attract different users.

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