



Understanding the Factors Influencing Artificial Intelligence Adoption in Organizations: An Empirical Investigation of Technological, Organizational, and Environmental Determinants

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ARTICLE INFO	ABSTRACT
Submission: August 05, 2026 Revised: August 20, 2026 Accepted: September 09, 2026 Available Online: September 22, 2026 Keywords: Artificial Intelligence Adoption, Technological Determinants, Organizational Determinants, Environmental Determinants, Organizational Readiness, Management Support. Corresponding author: Amaar Shakeel Email: amaarshakeel@gmail.com	Artificial Intelligence (AI) is increasingly being adopted by organizations to improve operational efficiency, decision-making, innovation, and organizational performance; however, the successful adoption of AI depends on a combination of technological, organizational, and environmental conditions. This study examined the factors influencing AI adoption in organizations by focusing on technological determinants, organizational determinants, and environmental determinants. A quantitative research design was employed, and data were collected through a structured adopted questionnaire administered using Google Forms. The study included a sample of 423 respondents selected through purposive sampling from employees and professionals working in organizations and institutions in Pakistan. The collected data were organized in Microsoft Excel and analyzed using IBM SPSS through descriptive statistics, reliability analysis, Pearson correlation, multiple linear regression, independent-samples t-test, and one-way ANOVA. The findings indicated that technological, organizational, and environmental determinants were positively associated with AI adoption, while all three factors significantly contributed to explaining organizational AI adoption. The results further indicated significant differences in AI adoption across selected demographic groups. The study is significant because it provides an integrated understanding of the conditions that support AI adoption and highlights the importance of technological readiness, organizational capacity, management support, and favorable external conditions. The findings can assist organizational managers, policymakers, and other stakeholders in developing appropriate strategies for effective AI implementation and organizational preparedness.

Introduction

Artificial Intelligence Adoption in Organizations

Artificial Intelligence (AI) has various organizational uses including automating and analysing data, and making predictions and decisions. AI can process large amounts of data, and therefore can be used to perform a wide range of organizational tasks. Many organizations have adopted AI to gain a competitive edge. It has been found that the use of AI by an organization is determined by various factors other than the technology itself, including the organization and the environment in which the organization operates (Kim & Lee, 2024). The use of AI by an organization is determined by how the organization is structured, the data available to the organization, the skills and experience of the organizational employees, the economic environment within which the organization

operates, the social environment within which the organization operates, and other psychological and behavioral factors that affect employees.

AI provides many benefits to an organization and consequently many organizations have an interest in AI. It has been found that the key reason many organizations do not gain the full potential of AI is due to various limitations including the skills and experience of employees, the capital of the organization, the strategy of the management, and regulations and competitors. A recent meta-analysis on 12 studies and 3,398 participants examined various elements of the Technology–Organization–Environment framework (TEO), and found effects for most of them (Pinto et al., 2025). Given this background, the current study examines how Artificial Intelligence (AI) influences the factors included in the TOE framework. The TOE framework is widely used because it considers not only technology but also the organizational and environmental conditions that affect technology adoption. In this framework, AI adoption is influenced by the features and capabilities of AI technology, the characteristics of the organization, and external factors such as market conditions

Technological Determinants

Technological determinants refer to the features of a technology and the surrounding technological environment that influence whether the technology is adopted by an organization. In regard to Artificial Intelligence (AI), these determinants might include, but are not limited to, relative advantage, compatibility, and integrity. Relative advantage refers to the degree that AI is thought to be superior to other available alternatives, for example, human or automated alternatives. Compatibility of AI to an organization refers to the extent to which the AI aligns to the organization's processes and systems and the infrastructure required to support the AI (DeStefano et al., 2017).

Some of the characteristics of AI and the infrastructure that supports it require a significant level of integration and may raise risks for an organization. These considerations, along with the cost of acquiring and integrating AI, need to be carefully assessed by an organization prior to adoption. The perception of the AI being complex can raise uncertainty in an organization. Some research in the insurance industry has found that for the adoption of AI, relative advantage and the perception of AI as being complex were the most salient factors (Gupta et al., 2022).

For an organization, the adoption of AI has the potential to enhance the speed and quality of services, improve analysis, and allow automation of tasks and processes. While the potential benefits of the integration of AI are clear, for an organization to consider adoption, a range of other factors must align and the integration must be integrated into the organization in a compatible manner. The same more recent studies that focus on organizational AI adoption cite technology-related factors as the next most important group of determining factors (2024).

AI is considered suitable for adoption when an organization believes it can be effectively integrated with its existing technologies and that the expected benefits of AI are greater than the costs involved. Of course, the remaining considerations must also be taken into account, such as the organization's level of acceptance and adaptability to the AI. There are always factors that serve as a barrier to adoption, but the salient question here is how large is the barrier relative to the overall case for adoption. Recent reviews have found that, more often than not, AI adoption is explained by reasons of relative advantage and compatibility. A third determinant, integration, was found to be consistently absent across the studies (Coccia, 2010).

Organizational Determinants

Organizational Determinants refer to the internal conditions of an organization that enable it to use AI. Those conditions might be the presence of an adequate level of management commitment, the readiness of the organization, the capability and willingness of the employees to learn, the skills and experience of the employees, the size of the organization, and its capacity for and commitment to innovation. Adopting AI typically involves the restructuring of organizational procedures, and therefore, the organization should be sufficiently prepared to implement and adapt to the changes that this involves. It has been indicated that in the research on AI that the most important conditions, and possibly the most restrictive ones, have to do with the organization (Basol & Dogerlioglu, 2014).

Management commitment has been mentioned because this level of commitment usually involves the allocation of financial and human resources. Top management can lead the process of commitment and adoption of AI by determining the organization's strategic goals and focusing on the means required to accomplish them. In addition, top management can lower the level of resistance that may exist among the employees by leading and guiding them in the adoption of AI. Management commitment and

organizational readiness are the major conditions that facilitate an organization to use AI, and this has been confirmed by recent meta-analysis studies (Dobbin et al., 2011).

Similar to management commitment and organizational readiness, human readiness is also important. Employees need to have the necessary skills and willingness to effectively use AI systems. Lack of human readiness may cause an organization to lack the ability to integrate AI in its procedures, and this may depend on the context and field of the organization. Francis and Desai (2005) analyzed the insurance industry and found that while financial and managerial support impacted behavioral intent, the same was not true for technology.

Adoption of AI in organizations depends on management's willingness to provide financial and managerial support and the organization's ability to effectively integrate AI into its business processes. Relatedly, other researchers conclude that the integration of AI within a firm is constrained by management and organizational factors, including, inter alia, the firm's readiness to adopt the technology. Other research into the integrative stream of the AI adoption literature identifies the same factors as critical determinants of a firm's integration of AI.

Environmental Determinants

Environmental determinants refer to outside conditions that can influence an organization's adoption of AI. These conditions can include competitive conditions, legal and regulatory conditions, market and industry conditions, supporting conditions, and other organizational conditions. Usually, organizations make technology adoption choices with external conditions in mind. This is because the markets and legal and regulatory environments in which organizations function can call for and encourage the adoption of various technologies. Therefore, understanding external conditions can help explain technology choices made by organizations.

Among external conditions, competitive conditions can be the most influential. Organizations adopt AI to remain competitive by improving their products and services. Conditions can also include encouragement by governments through regulations and other mechanisms to adopt AI. Supporting conditions also include partnerships by vendors to help implement AI. Other conditions can include requirements to protect personal and sensitive data. Requiring conditions can also positively influence the adoption of AI. Regulations and other policies can influence the level of confidence an organization can have when implementing AI. Restrictive and over controlling conditions, however, can have the opposite effect.

From analyzing the insurance sector, it was determined that regulatory and market conditions, along with competition, shaped organizations' intentions to integrate AI (Gibson, 2018). In this regard, the importance of external factors should not be discounted. Competitive pressure in the market can result in the adoption of AI to assist in serving customers and remain competitive. Conversely, the support and advocacy of governments and regulators can help ease customers' concerns about the implementation of AI. Also, it should be noted that, in the absence of the necessary AI-related skills and capabilities within an organization, the needed support can be provided by allied organizations. It can, therefore, be accurate to state that for the successful implementation of AI, a merging of technology, along with the support of regulators and competitors, is needed. In recent studies, AI adoption has been approached from a similar multidimensional perspective. It has been posited that a combination of various factors (e.g., competitive dynamics and Regulatory conditions) influences the adoption of AI (Salgado et al., 2020).

Integrated Perspective on AI Adoption

Three elements considered in this study reflect interdependent rather than fully distinct elements. Viewed from a technological perspective, the determinants include the assessment of the compatibility and feasibility of AI. From an organizational perspective, the determinant is the assessment of the organizational readiness and the resources at the organization's disposal. From the environment, the determinant is the external pressures and supportive conditions. The aforementioned elements reflect the integrated nature of the conditions for the adoption of AI (Romeo & Lacko, 2026).

From the above description of the conditions, it is evident that more than one condition must be present for the adoption of AI. The conditions may enable an organization to implement AI but may not compel the organization to do so. The reverse may also be the case; conditions may compel an organization to adopt AI but may not provide the organization the capability to do so. It has also been established through a recently concluded meta-analysis that the conditions may compel the organization to adopt AI (Tiago & Almeida, 2026).

Consequently, in this study, the integrated nature of the conditions has been assumed to explain the adoption of AI by an organization. Using these integrated conditions approach, it is anticipated that the barriers and drivers to the adoption of AI by

organizations will be identified and explained. As the focus of organizations has shifted to the widespread integration of AI, it is also expected that the conditions for adoption of AI will continue to vary (Desveaud & Bawack, 2026).

Research Objectives

- To examine the influence of technological determinants on Artificial Intelligence adoption in organizations.
- To determine the influence of organizational determinants on Artificial Intelligence adoption in organizations.
- To assess the influence of environmental determinants on Artificial Intelligence adoption in organizations.

Problem Statement

Although sophisticated decision-making and improved efficiency and innovation in service delivery are some of the ways AI can benefit an organization, research shows adoption rates are low. Several theories have been advanced to explain the lack of adequate AI adoption. However, the fragmentation of these theories across different domains makes it difficult to understand why and how various organizations make the choices they do regarding AI. Recent studies suggest past research has rehashed the same arguments about AI in various industries and failed to articulate how the different interrelated determinants of the same phenomenon (e.g. technology, organization, and environment) influence AI adoption. Furthermore, it has been shown the degree to which the TOE factors influence AI adoption is contextual and industry specific. Therefore, the aim of the research is to Fill the research gap by examining how the TOE factors of an organization collectively influence the decision to adopt AI (Neumann et al., 2024).

Significance of the Study

This study is significant because it helps explain reasons for and barriers to Artificial Intelligence (AI) use within businesses and organizations. By incorporating multiple business and industry conditions, this research gives business managers and personnel the ability to analyze combinations of business and industry situations and conditions in which the use of AI is warranted. Use of the findings from this research is expected to lead to the effective and judicious use of AI by businesses and organizations. Because of the information provided herein, business and industry leaders and policy makers may better understand under what conditions businesses may warrant and use AI. This research provides a foundation for other researchers interested in the field of Organizational AI.

Literature Review

Theoretical Foundation of Organizational Artificial Intelligence Adoption

Artificial Intelligence (AI) is a rapidly growing technology, and organizations need to consider factors beyond technology alone for its successful adoption. One useful framework for understanding this process is the Technology–Organization–Environment (TOE) framework, developed by (Tornatzky, 1990). The TOE framework has been utilized in AI studies to expand the assessment beyond the technology to the organizations' preparedness and the environment within which the technology will be implemented. AI systems are continually evolving to perform a variety of tasks. As a result, organizations have to review their readiness to implement AI systems, the reasons for implementing the systems, and the existing and future trends in the industry.

Numerous recent studies have built upon the TOE framework to capture other attributes of AI including the level of data involved, the degree of complexity, and the level of regulation, amongst others. A systematic review of 90 studies on the adoption of AI by organizations concluded that there are multiple influences of the adoptions including factors beyond the AI systems. Additionally, a recent synthesis of research on AI in organizations has outlined the integration of AI within the framework of the other organizations' technologies and processes (Horani et al., 2025).

Technological Readiness and AI Adoption

Technological readiness is defined as the ability of an organization to effectively implement AI-based products and services. Different factors such as the integration of various organizational information systems, the availability of required data, and sufficient computing resources along with an appropriate level of cybersecurity, determine the extent to which an organization can overcome technical barriers when using AI. It is understood that in the absence of required technology, organizations can face a range of barriers when integrating AI. For instance, Uren and Edwards (2023) point out that a key factor determining the readiness of an organization to adopt AI is the assessment of the organizational technology environment (OTE) for the integration of AI products and services.

In related studies conducted using the TOE framework, findings show that AI adoption requires an organization to have a relatively integrated and advanced information technology infrastructure. This shows that organizations may respond more to the pragmatic aspects and compatibility of AI than to complexity. Lerch et al. (2024) conduct a synthesis of literature on the adoption of AI by organizations, and identify technological conditions as the main concerns that organizations have to take into account when using AI in their production processes. These conditions determine the extent to which AI is implementable and beneficial. Where there are opportunities for AI to be incorporated into business processes, and where the use of AI is likely to improve business performance, there are strong technological justifications to adopt AI. In addition, there must also be a will and ability in the organization to deploy the required technology. For example, AI may process vast amounts of data, but if an organization has no means to collect the data, the AI would be of little value. For this reason, most recent studies have combined technological readiness and other factors of the adoption situation to describe and predict the case of AI implementation (Flavián et al., 2022).

Perceived Technological Benefits and Compatibility

Relative advantage determines how much an organization believes that implementing AI will improve compared to the benefits of other technologies and processes. Benefits might be increased speed, better automated systems, and lower costs. With AI, there is a risk that processes will become so efficient that they will replace human workers. On the other hand, AI can improve processes that might otherwise seem trivial. A successful AI implementation requires that the organization determine how AI will function with other organization processes, technology, and procedures (i.e. compatibility). Several case studies have supported these two concepts. Karahanna et al. (2006) found that the majority of case studies in their literature review reported a favorable relationship with both relative advantage and compatibility for AI. For example, Alshammari and Alshammari (2024) also reported that AI relative advantage and AI process compatibility (TOE) were positively related to the adoption of AI by Saudi Arabian SMEs.

These case studies show that organizations are mostly concerned about the net value of AI and the flexibility of AI for organization processes (compatibility). According to the case studies, there is a general agreement that the implementation of AI is justified when the relative advantage and the fitness of the AI system (compatibility) has been confirmed. However, the importance of relative advantage and fitness of the AI system may depend on several factors. For example, the diversity and complexity of technology will depend on the industry and size of the organization. Further, recent studies show that different sectors and different technology focuses might need different AI adoption considerations.

Organizational Capacity for Artificial Intelligence Implementation

Organizational capacity is a term that refers to an organization's potential to assess, incorporate, and merge AI into its operations. Considering the nature of AI, its integration into an organization may change how the organization manages work, makes decisions, and uses data. Organizational capacity refers to the internal potential of an organization to adapt to new changes. Without adequate organizational capacity, an organization can recognize the potential benefits of AI but be incapable of realizing those benefits.

The inability of organizations to fully integrate AI has led several researchers to examine why some organizations are not ready to integrate AI. For instance, a large part of Weber et al. (2023) research focused on why organizational readiness has a favorable effect on AI integration. Findings from other similar studies have indicated that the absence of organizational readiness constrains an organization's ability to effectively implement AI.

In consideration of the above, it can be said that for an organization to be able to integrate AI, the organization must be financially able to bear the cost of integrating AI. Further, management of the organization must be committed to integrating AI. Other researchers have supported this by noting that various environmental and organizational constraints limit the integration of AI. Taken together, it can be said that commitment of management of an organization and other contextual factors largely influence the integration of AI (Reim et al., 2020).

Management Support and Organizational AI Adoption

Management support refers to the role of a company's upper management team in promoting the acceptance and integration of AI within the organization. Management's influence over technology acceptance is reflected in the strategic allocation of the organization's resources, the establishment of the organization's strategic goals, the promotion of organizational learning, the sponsorship of employee training, and the reinforcement of organizational change. The nature of AI requires the presence of management support in order to provide the required organizational infrastructure and to train the workforce to adopt and integrate the new technologies within the organization.

Several researchers have shown that management support is integral to an organization's acceptance of AI. In the studies on organizational AI implementation reviewed by Horani et al. (2025), management support was described as a positive factor, and in the studies on the integration of AI within the organization, leadership and other organizational supports were described as positive factors (Pyo et al., 2026). In the absence of management support for AI, the integration of AI within the organization is unlikely. It is rational to expect that with management's support of AI, the integration of the technology within the organization's processes becomes strategic, and provides the necessary resources to train and equip employees to embrace AI. The opposite is true. Management's lack of support for AI integration results in a restriction of the organizational resources available to support AI initiatives.

External Pressures and Institutional Conditions

Environmental determinants describe external conditions that impact the incorporation of advanced technologies within organizations. In the case of artificial intelligence (AI) within the workplace, the above conditions may include the actions of competitors, government agencies, and customers, as well as the relationships with vendors and suppliers. All organizations work within competitive and institutional environments, and therefore the incorporation of AI by competing organizations can, and probably will, stimulate similar changes within other organizations within the same industry. Industry conditions and the actions of competing firms can also provide pressure for an organization to develop, and ultimately incorporate, various advanced and innovative technologies. In some cases, the above pressures can be eased by government initiatives (Fikru, 2014).

Although research often focuses on the internal factors that encourage technology adoption, several organizational and environmental conditions can also support and simplify the adoption of AI in firms. The relationships and pressures created and supported by firms in the same industry can impact AI adoption. For example, within professional services firms, the need for competitive differentiation influenced AI adoption, and regulators impacted the firms' view of the appropriate course of action. These conditions depended on the individual firm and the level of maturity of AI adoption within the firm. Similar conditions influenced the adoption of AI within public social and related services firms (Hanim Mohamad Zailani et al., 2012).

Competitive Pressure and Government Support

Competitive pressure is the level to which management teams believe they must implement AI technology to adapt to changing competition and market conditions. Although the integration of AI into day-to-day business activities places a demand on firms to keep pace with changes occurring in the marketplace and to respond to the needs of various customers, firms may feel a sense of urgency to research and implement various AI options (Becker, 1983).

The availability of governmental resources impacts the environment as AI implementation may involve uncertainty regarding governmental rules and regulations. The investment and governance of data may also impact the willingness of an organization to adopt AI. Certain governmental policies may offer clarity and support for the integration of AI. The influence of competitive pressure and favorable governmental policies, in conjunction, are positive for the adoption of AI.

The integration of various AI technologies may be influenced by the level of competition faced by a firm and the degree to which governmental policies support the integration of AI. Other research supports the notion that the integration of AI may be influenced by the extent to which various environmental conditions create a sense of urgency for a firm to integrate AI in support of business operations. The integration of AI may require the consideration of environmental, organizational and technological conditions (Flamm, 2012).

Synthesis of Technological, Organizational, and Environmental Determinants

AI adoption is a result of multiple conditions. The literature suggests the conditions can be grouped as technology conditions, organization conditions, and environment conditions. The integration of the TOE framework allows analysis of multiple conditions and trade-offs simultaneously. The adoption of AI by an organization is influenced by multiple and interrelated conditions. The conditions can also be characterized as technology, organization and environment conditions.

The TOE framework allows analysis of multiple conditions. Several studies have adopted the TOE framework in empirical research. One such study focused on AI in supply chain management. The research shows variation in trade-offs and barriers across multiple conditions. With regards the relevance of multiple conditions for analysis, one study showed variations in conditions among peers in the same industry. From the body of literature available, research has supported the need to analyze conditions in conjunction

with each other. This research focuses on the TOE framework to analyze conditions for AI adoption by organizations (Raj & Jeyaraj, 2023).

Research Gap

Although previous studies have established that Artificial Intelligence adoption is influenced by technological, organizational, and environmental conditions, the existing literature remains fragmented, with many studies examining selected determinants within particular industries, technologies, or geographical contexts rather than assessing the three dimensions together in a unified empirical model. A systematic review of organizational AI adoption research identified substantial variation in the factors examined and highlighted the need for more integrated research connecting AI-specific characteristics with organizational and environmental conditions (Salah et al., 2025). More recent evidence also indicates that although several TOE factors significantly influence AI adoption, the strength and significance of individual determinants vary across contexts, creating a need for further empirical investigation (Radhakrishnan et al., 2022). In addition, recent reviews report inconsistencies in how organizational AI readiness and its determinants are conceptualized, demonstrating that the interdependence among technological capabilities, organizational capacity, and environmental conditions remains insufficiently examined (Hirtranusi et al., 2026). Therefore, this study addresses the gap by empirically examining technological, organizational, and environmental determinants simultaneously to provide a more integrated understanding of AI adoption in organizations.

Hypotheses of the Study

- **H1:** There is a significant relationship between technological determinants, organizational determinants, environmental determinants, and Artificial Intelligence adoption in organizations.
- **H2:** Technological determinants, organizational determinants, and environmental determinants significantly predict Artificial Intelligence adoption in organizations.
- **H3:** There is a significant difference in Artificial Intelligence adoption between the two demographic or organizational groups.
- **H4:** There is a significant difference in Artificial Intelligence adoption among different demographic or organizational groups.

Conceptual Framework

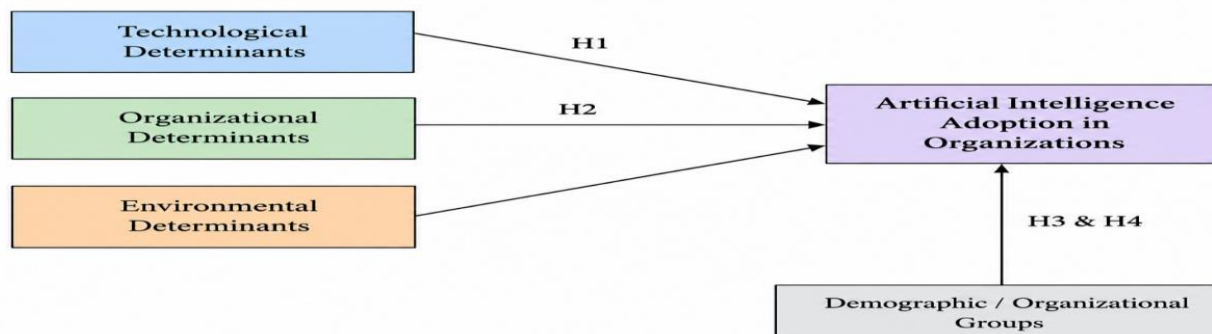


Fig: 1 Conceptual Framework

Methodology

Research Design

The study employed a quantitative research design. The author created a questionnaire to assess the role of various determinants of Artificial Intelligence (AI) and collected responses through the questionnaire. The questionnaire was distributed via the internet.

Population

The research population included employees and professionals working in different organizations and establishments in Pakistan. The research covers the major establishments and organizations in Multan, Lahore, Faisalabad, Bahawalpur, Sargodha and Karachi including Bahauddin Zakariya University, Islamia University Bahawalpur, University of Punjab, Government College University Faisalabad, University of Sargodha, University of Education Lahore, Women University Multan and University of Sindh.

Sampling Method

The research used the purposive sampling method. In this method, the researcher identifies the respondents who have firsthand contact and knowledge of the information needed in the research.

Sample size

The research questionnaires were distributed to 423 participants, and all 423 completed questionnaires were included in the analysis. Data were collected from the selected respondents using a structured survey questionnaire.

Data collection

Information and study materials were collected through a research instrument. The research instrument is divided into different parts. The first part assesses the use of technology and determinants of artificial intelligence. The second part assesses organizational determinants and the last part assesses environmental determinants. Surveys were created on Google Forms, from which the author downloaded and imported the files into Excel for analysis. The author then imported the data into SPSS for further analysis.

Analysis of Data

The data were organized in SPSS using descriptive statistics. Internal consistency of measurement scales was assessed using Cronbach's alpha. Pearson correlation was used to assess the relationship between the variables: technological, organizational and environmental determinants and AI adoption. Multiple regression analysis was used to assess the combined effect of the three determinants on AI adoption. The effects of the three determinants were assessed independently. The difference in AI adoption between the two groups created by a demographic or organizational variable was assessed using an independent samples t-test. A one-way Analysis of Variance (ANOVA) was performed to assess the difference in AI adoption between groups created by a demographic or organizational variable containing three or more groups. Where a significant difference was observed, a post-hoc test was performed.

Table 1: Demographic Characteristics of Respondents (N = 423)

Demographic Variable	Category	Frequency (f)	Percentage (%)
Gender	Male	238	56.3
	Female	185	43.7
Age	18-25 years	96	22.7
	26-35 years	151	35.7
	36-45 years	112	26.5
	46 years and above	64	15.1
Education	Bachelor's degree	87	20.6
	Master's degree	174	41.1
	M.Phil.	103	24.3
	Ph.D.	59	14.0
Work Experience	Less than 5 years	118	27.9
	5-10 years	143	33.8
	11-15 years	91	21.5

Demographic Variable	Category	Frequency (f)	Percentage (%)
Organization Type	More than 15 years	71	16.8
	Public	251	59.3
	Private	172	40.7
Total		423	100.0

Survey results showed that 238 (56.3%) participants were males and 185 (43.7%) were females. The age group 26-35 years had the highest response (35.7%) followed by 36-45 age group (26.5%). Regarding education, 41.1% of the respondents had a master's degree, 24.3% had an M.Phil and 14.0% had a Ph.D. The highest response on work experience was 5-10 years (33.8%). Lastly, the highest response was from the public (59.3%) and the least from the private (40.7%). The results showed that the survey had a relatively large response rate from the target population.

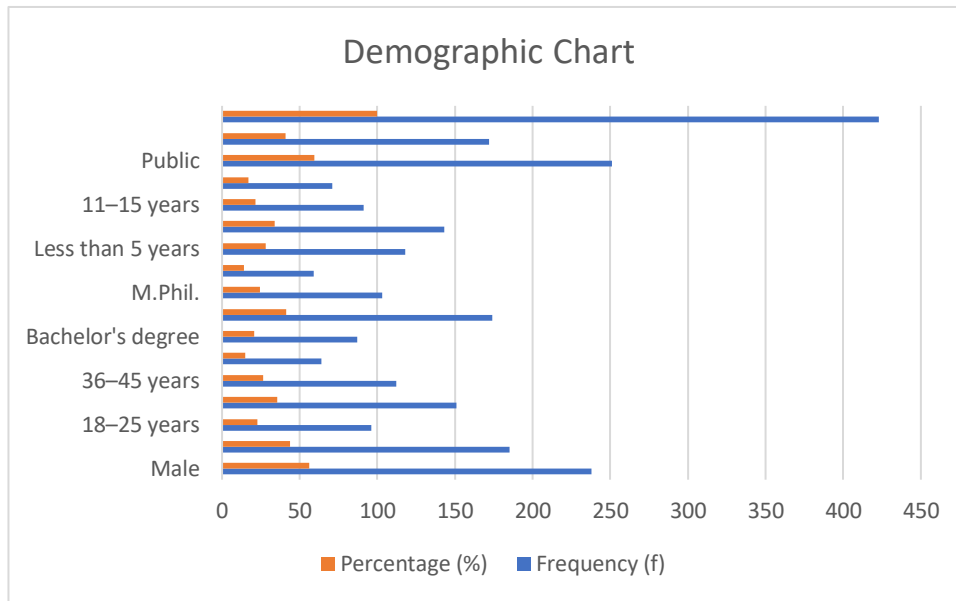


Fig. 2 Demographic Characteristics of Respondents (N=423)

Table 2: Reliability, Mean, and Standard Deviation of Study Variables (N = 423)

Variable	No. of Items	Cronbach's Alpha (α)	Mean	Std. Deviation
Technological Determinants	6	0.891	3.78	0.71
Organizational Determinants	6	0.904	3.82	0.68
Environmental Determinants	6	0.876	3.74	0.73
Artificial Intelligence Adoption	6	0.912	3.81	0.69

The reliability results showed good to excellent internal consistency for all study variables. Cronbach's alpha ranged from 0.876 to 0.912. The means ranged from 3.74 to 3.82. Standard deviations ranged from 0.68 to 0.73. Participants' responses showed adequate variability for the measurement scales. Consequently, the measurement scales reached the standard to be used in advanced analysis.

Table 3: Correlation among Technological Determinants, Organizational Determinants, Environmental Determinants, and AI Adoption (N = 423)

Variables	Technological Determinants	Organizational Determinants	Environmental Determinants	AI Adoption
Technological Determinants	1	.624**	.571**	.682**
Organizational Determinants	.624**	1	.648**	.731**
Environmental Determinants	.571**	.648**	1	.694**
AI Adoption	.682**	.731**	.694**	1

Technological determinants had a moderately to strongly positive relationship with AI adoption ($r = .682$, $p < .01$). The same relationship held true for the organizational determinants ($r = .731$, $p < .01$). The analysis showed that the AI adoption was positively associated with the environmental determinants ($r = .694$, $p < .01$). Thus, it was concluded that combining and integrating the right technologies with the adequate level of support and organizational commitment in the right environment would warrant AI adoption. Thus, H1 was supported.

Table 4: Multiple Regression Analysis of Technological, Organizational, and Environmental Determinants Predicting AI Adoption (N = 423)**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.786	.618	.615	.428

ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	116.842	3	38.947	212.487	<.001
Residual	76.823	419	.183		
Total	193.665	422			

Regression Coefficients

Predictor	B	Std. Error	Beta (β)	t	Sig.
Constant	.684	.152	—	4.500	<.001
Technological Determinants	.284	.041	.301	6.927	<.001
Organizational Determinants	.367	.043	.374	8.535	<.001
Environmental Determinants	.301	.042	.328	7.167	<.001

Multiple regression analysis indicated that artificial intelligence (AI) adaptation was explained by various degrees of influence of technology, organization and the environment. The overall regression model attained statistical significance, ($F(3, 419) = 212.487$, $p < .001$) and explained 61.8% of the variance in AI adoption. Among the factors studied, adoption of AI was significantly influenced by the following in that order: technology ($\beta = .301$, $p < .001$), organization ($\beta = .374$, $p < .001$) and the environment ($\beta = .328$, $p < .001$). Thus, H2 was supported. Independence of Means score for AI adoption by gender showed no significant differences ($t(421) = 1.875$, $p = .062$, $d = .32$).

Gender	N	Mean	Std. Deviation	t	df	Sig. (2-tailed)
Male	238	3.87	0.64	2.164	421	.031
Female	185	3.73	0.66			

Results of the independent-samples t-test on AI adoption by respondents based on their gender showed that there is a significant difference between the means. The mean score of AI adoption for males ($M = 3.87$, $SD = 0.64$) was higher than that of females ($M = 3.73$, $SD = 0.66$). The independent-samples t-test further showed that the difference between the means was statistically significant ($t(421) = 2.164$, $p = .031$). Therefore, it can be concluded that there is a significant difference between the two samples, and thus, supported Hypothesis H3.

Table 6: One-Way ANOVA of AI Adoption across Age Groups ($N = 423$)

Age Group	N	Mean	Std. Deviation
18–25 years	96	3.62	0.67
26–35 years	151	3.78	0.64
36–45 years	112	3.91	0.61
46 years and above	64	4.02	0.59
Total	423	3.81	0.65

Source	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	7.842	3	2.614	6.351	<.001
Within Groups	172.523	419	0.412		
Total	180.365	422			

One-way ANOVA indicated significant differences in AI adoption across the four age groups, $\chi^2(3) = 6.351$, $p < .001$. The mean adoption score for the 18 to 25 age group was 3.62, and for the age group 46 and above it was 4.02. There was a positive association between AI adoption and age. Hence, we accepted H4.

Discussion

The results of this study indicate that consideration of the three determinants: technological, organizational, and environmental, helps explain why and how Artificial Intelligence (AI) is adopted by organizations. The three determinants had a positive influence on AI adoption, and the results of the regression analysis further indicated that these determinants accounted for the variation in the adoption of AI by organizations. This indicates that AI adoption is an organizational process that requires consideration of multiple factors.

For the adoption of AI by organizations, it is necessary that the technology is evaluated, and if it is found to be useful, it should be integrated. AI adoption should be organizational strategy, and to achieve this, the positive influence of the three determinants should be ensured. The results of this study further showed that the positive influence of the three determinants on AI adoption was significantly explained by the regression analysis. The results of a recent meta-analysis by (Badghish & Soomro, 2024) further indicated a positive influence of the three determinants on AI adoption by organizations, and supported the results of this study. Phuoc (2022) also supported the results of this study by placing technology and system related factors as the main influences on AI adoption. This further reinforces the results of this study.

This study's findings suggest that for the sample population, certain characteristics of an organization, also known as organizational determinants, most strongly influenced the adoption of AI. Out of all the factors considered, these determinants demonstrated the largest impact on AI adoption. From the results of other studies, it can be inferred that for the sample population, if the management team of the organization is not ready to adopt the AI, the organization will not be able to achieve AI adoption. It is also suggested that the implementation of AI requires the support and readiness of the organization as a whole, which is generally influenced by the top management of the organization. It can be inferred that adoption of AI is influenced by various factors.

The results also showed that the sample population was influenced by environmental determinants. Competitive pressures and governmental supports were the major influences in the sample population for the adoption of AI. These results are in line with (Shant Priya et al., 2023). It was also shown that the sample population was largely composed of men (H5). These results illustrate that AI has not, generally speaking, reached gender parity (Khalifa et al., 2023).

These results indicate that the difference in adopting AI among the surveyed population is due to gender. This means that there is not enough evidence to show that being male or female causes difference in the adoption of AI. The results of the analysis of variance (ANOVA) pointed to a significant difference with regards to AI adoption and age, hence, supporting H6. It is important to consider the other demographic variables associated with the adoption of AI. Previous research concerning the adoption of AI by organizations has noted that there exist several variables at the organization, the field (environment) and the technology, and eventually the personnel which inform AI adoption. For example, there may exist a negative attitude amongst the personnel toward the adoption of AI; this may result in low managerial support and ultimately inhibit the AI adoption.

The results of the study provide evidence to inform the integration of the fields of Organization, Technology and Environment (OTE) to informed AI Adoption. Results of the statistics performed on the data showed that for the adoption of AI by an organization to be successful, it is required that the field, the technology and the organization be in equilibrium (Guedes & Júnior, 2024).

Conclusion

The study identified several factors that influence the adoption of Artificial Intelligence (AI) in organizations. These factors are related to technology, organizational characteristics, and the external environment. The findings showed that all three factors have a positive effect on AI adoption. Among them, organizational and environmental factors were found to play a particularly important role in encouraging organizations to adopt AI. Overall, the study highlights that successful AI adoption depends not only on the technology itself but also on the organization's readiness and the conditions of its external environment

The study showed multiple aspects an organization needs to be successful when integrating AI in their firm. Beyond the right technology, an organization needs adequate and functioning systems, as well as management and external situation, such as competitor and peer groups. The differences in AI acceptance based on gender and age further shows AI acceptance is contextual and depends on the situation. The study provided a holistic view of the situation when an organization considers integrating AI, as well as evidence to support when an organization is ready to embrace AI.

Future Implications

Future studies should examine AI adoption across different industries, organizations of various sizes, and diverse geographic regions. This would provide a broader understanding of the factors that influence AI adoption and contribute to the existing body of knowledge in this area. Other variables, such as the level of AI/ML awareness of employees, employee training, data integrity and security, organizational culture, ethics, and legality, should also be assessed. Research should focus on long-term AI/ML integration and the factors that influenced and influenced the integration. Additional research should explore the technology and organizational integration barriers associated with AI/ML. Further, studies should expand the existing body of knowledge by exploring international and multinational samples. Other validation and extension studies are warranted.

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