Technological Determinants of AI Adoption for Sustainable HRM and Organisational Innovation: Evidence from Private Hospitals in Addis Ababa, Ethiopia

Sebsib Husen Usman[1*], Dr. Preeti Nair[2]

[1*]Research Scholar, Faculty of Management, Parul University, Gujarat, India
[2]Professor, Faculty of Management, Parul University, Gujarat, India
*Corresponding Email: sebsibhusen8@gmail.com

Abstract
Artificial Intelligence (AI) is increasingly recognised as a strategic enabler of innovation, sustainable entrepreneurship, and human resource management (HRM), particularly in resource-constrained service organisations in emerging economies. This study examines the technological determinants of AI adoption in HRM among private hospitals in Addis Ababa, conceptualised as entrepreneurial healthcare enterprises operating under resource constraints, with comparative relevance to Asian emerging markets. Using an explanatory research design, primary data were collected from 337 HR and administrative staff and analysed using Pearson correlation and multiple linear regression techniques. The findings reveal that IT infrastructure is the strongest positive predictor of AI adoption, followed by digital literacy, perceived ease of use, and system compatibility, while data security concerns negatively influence adoption. The model explains 48% of the variance in AI adoption, indicating substantial explanatory power. Beyond technological factors, the results demonstrate that AI adoption enhances sustainable organisational performance by improving operational efficiency, optimising resource utilisation, and supporting data-driven decision-making. The study contributes to the literature by demonstrating how AI-enabled HRM supports innovation capacity, human capital development, and inclusive organisational practices. The findings offer important implications for policymakers and practitioners in Asian and other emerging economies seeking to promote digital transformation, SME competitiveness, and alignment with sustainable development goals (SDGs).

Keywords: Artificial Intelligence, Technological Factors, AI Adoption, Healthcare

1. INTRODUCTION

The growing influence of Artificial Intelligence (AI), as a defining force of an organisation, is currently becoming a pivotal reformer of organisational functions, competitiveness, and sustainable development in industries. Within the context of the human resource management (HRM), AI-based systems optimise recruitment, improve workforce planning, and minimize administrative wastes, thus making resource utilisation and sustainability more effective. In addition to operational efficiency, AI is currently being viewed as a strategic capacity to help organisations engage in innovation, more effective decision-making, and resilience to dynamic and competitive business settings in the long term (Gurjar et al., 2024). The trend in the emerging economies is that private hospitals are becoming more of an entrepreneurial service enterprise which competes based on innovation, quality of its services and efficiency in the operations. These organisations have limited resources, institutional barriers, and technology constraints, just like small and medium-sized enterprises (SMEs) that influence the adoption of AI (Omrani et al., 2022; Oyekunle and Boohene, 2024). In this setting, HRM practices based on AI can have a key role in increasing the flexibility of organisations, facilitating the development of human capital, and ensuring innovation-based expansions. As a result, AI adoption is not a technical choice, but a strategic entrepreneurial process, which determines the performance of the firm, as well as its competitiveness and sustainability results (Badghish and Soomro, 2024; Nawaz et al., 2024).

Nevertheless, although AI has been realised as a potential in HRM, its use is not uniform especially in third world countries like Sub-Saharan Africa. In fast-growing urban centres such as Addis Ababa, the interest of private hospitals in digital transformation is on the increase, but the introduction of AI technologies into the HRM functions is only at its initial phase. There are also a number of technological enablers or inhibitors to adoption that include IT infrastructure, digital literacy, compatibility with the system, perceived ease of use, and data security (Okolo et al., 2022; Madanchian and Taherdoost, 2025). These determinants play a major role in promoting sustainable and innovation-based organisational activities in resource-constrained settings, which is why understanding them is crucial (Ade-Ibijola and Okonkwo, 2023). Notably, the Ethiopian setting has structural and institutional similarities with most of the Asian emerging economies, including, India, Indonesia, and Vietnam, where the SME-based service sectors are challengeable in the similarity of the digital capability, infrastructure disparity, and

ambiguity. Within such settings, the use of AI is being associated with more global development goals, such as productivity, inclusive development, and technological improvement (Goswami et al., 2023; Kim et al., 2024). Thus, the results of this work are not only limited to the local context but also can be related to the comparative analysis of AI-driven change in emerging and Asian markets (Almarashda et al., 2021).

AI-enabled HRM is more or less in line with the United Nations Sustainable Development Goals (SDGs), especially SDG 3 (Good Health and Well-being), SDG 8 (Decent Work and Economic Growth), and SDG 9 (Industry, Innovation, and Infrastructure). AI also enhances economic, social, and environmental aspects of sustainability by enhancing workforce efficiency, aiding the basis of a data-driven decision-making process, and stimulating an environmentally friendly approach to HR, like paperless, (Hmoud and Vrallyai, 2023; Slawomirski et al., 2023). In addition, the implementation of ethical AI as a component of corporate social responsibility (CSR) and inclusive innovation in organisations is supported by the application of ethical AI practices, such as data governance and transparency (Nyberg et al., 2025; Sucipto, 2024).

It is against this backdrop that this study analyses the technological factors behind the adoption of AI in HRM in the case of the private hospitals in Addis Ababa. In particular, it examines the role of IT infrastructure, digital literacy, compatibility of the system, perceived ease of use, and data security concerns, on the adoption of AI-driven HRMs. The work by placing the concept of private hospital as an entrepreneurial issue and locating the examine in a wider emerging economy and Asian comparative context, the study adds to the sustainable entrepreneurship literature, digital innovation, and strategic management literature (Khan et al., 2024; Tanantong and Wongras, 2024). The implications are useful to policymakers and organisational leaders aiming to support the use of AI, encourage SME competitiveness, and achieve sustainable development both in Africa and Asia.

2. REVIEW OF LITERATURE

The introduction of Artificial Intelligence (AI) into the field of human resource management (HRM) has become more and more the subject of investigation using well-known technology adoption and innovation frameworks, specifically the Technology-Organisation- Environment (TOE) framework, the Technology Acceptance Model (TAM), and the Unified Theory of Acceptance and Use of Technology (UTAUT). These models describe the effect of technological preparedness, organisational capability, and environmental factors to adoption. Regarding the key technological considerations influencing the user acceptance and organisational integration in the context of AI-enabled HRM, IT infrastructure, system compatibility, and perceived ease of use are crucial factors, and behavioural intentions, as well as effort expectancy, are factors that determine adoption outcomes (Khan et al., 2024; Kim et al., 2024; Yi and Choi, 2023). Also, the Innovation Diffusion Theory elaborates on the perceived benefits, complexity, and compatibility on the pace of adoption of AI technologies in organisations (Rogers, 2003).

Entrepreneurship wise, the use of AI is becoming more and more known as a strategic facilitator of innovation, especially in small and medium-sized businesses (SMEs) and service firms that provide entrepreneurial services. In developing economies, opportunities are identified, processes innovated, and competitive advantages through AI because the companies do not have resources to operate with. The literature of digital entrepreneurship also indicates that AI-based HRM can boost human capital efficiency, data-driven decision-making, and innovation potential of the firm, which in turn leads to the growth and sustainability of the venture (Badghish and Soomro, 2024; Omrani et al., 2022). Moreover, digital technologies enabled by entrepreneurial ecosystems allow firms to grow more effectively and react to the changing market conditions, which strengthens the position of AI as a driver of innovation development (Nawaz et al., 2024).

The importance of AI in improving organisational performance, innovation, and competitiveness have been made with substantial empirical evidence of the Asian economies. The research carried out in India, China, and South Korea shows that digital infrastructures, workforce abilities, and supporting systems are the key factors in AI use in HRM. To illustrate, studies conducted in the pharmaceutical and service industries in India indicate that organisational preparedness, technological competence, and regulatory correspondence have a strong influence on the AI adoption results (Goswami et al., 2023). Similarly, studies conducted in South Korea and Southeast Asia indicate that usefulness, ease of use, trust on the AI systems are significant factors in trying to adopt the systems (Kim et al., 2024; Tanantong and Wongras, 2024). These outcomes indicate that the economies led by Asian SMEs share structural features in common with other emerging markets, in which digitalization is a challenge and an opportunity.

The concept of sustainability is now one of the central elements of AI implementation, particularly in terms of Green HRM, social responsibility, and inclusive innovation. The AI-assisted HR systems are also helpful to the environmental sustainability, as they assist in decreasing the amount of paper-based operations and enhance efficiency of the operations. Meanwhile, AI contributes to social sustainability through improved workforce

planning, ensuring equitable recruiting behavior, or allowing data-driven decision-making that lowers bias in the case it is properly regulated (Hmoud and Vrallyai, 2023; Slawomirski et al., 2023). Nevertheless, the sustainability advantages of AI are conditional on the ethical practices such as transparency, accountability, and data security, which is a fundamental part of developing organisational trust and long-term legitimacy (Nyberg et al., 2025; Sucipto, 2024).

The use of AI has both opportunities and challenges in the environment of inclusive and social enterprises. On the one hand, AI can increase access to job opportunities, enhance service (delivery) and inclusive development, as it allows organisations to better align the skills with the job demand and increase their reach. Conversely, issues to do with job displacement, algorithmic bias, and digital inequality can potentially erode its inclusivity without the issues being addressed. The research in developing and Asian economies has emphasized the importance of digital literacy, institutional support, and regulatory frameworks as the key factor to make sure that AI will help to practically develop the economy and make it inclusive and equitable (Ade-Ibijola and Okonkwo, 2023; Okolo et al., 2022). Thus, the implementation of AI in HRM should be correlated with more general social and developmental goals in order to make sure that the technological progress does not promote the existing inequalities.

Even though the literature on this subject is growing, there are still major gaps in the evidence on how the technological determinants of AI adoption collaborate with entrepreneurship and sustainability performance in emerging economy settings. Although most of the previous research has concentrated on the developed or single-country Asian context; there has been scanty research work that has investigated how AI-driven HRM can facilitate sustainable entrepreneurship in resource-starved settings like private medical institutions. Furthermore, comparative understanding between the African and Asian environments is lacking, in particular, how the constraints of comparable structures affect the uptake of AI and innovation success (Almarashda et al., 2021; Madanchian and Taherdoost, 2025). To fill these gaps, this paper combines the technological, entrepreneurial, and sustainability views to offer a more holistic picture on AI implementation in HRM.

3. METHODOLOGY

3.1 Research Design

The paper adds to the literature concerning sustainable business practices and innovation by exploring the extent to which technological preparedness facilitates AI-based HR practices that sustain the organisational sustainability in the long-term. The chosen explanatory design is suitable because it will give the opportunity to investigate the causal relationships.

3.2 Sample and Sampling Procedure

Coachran's formula of proportionate sampling was used to select a sample size of 337 employees in the private hospitals of Addis Ababa and this would provide sufficient margin of error in organisational research in relatively large populations. Multi-stage sampling was used: At the first level, hospitals were randomly chosen, then the departments were stratified and the simple random sampling was used of the staff members in a department.

3.3 Data Collection

Paper-based, self-administered questionnaires were used to collect data and their focal points were technological infrastructure, digital literacy, perceived ease of use, compatibility of the existing IT systems, and attitudes of the respondents towards AI in HRM. Other questions included demographic variables as well as the current rates of the use of AI tools.

3.4 Data Analysis

Data were analyzed with the help of SPSS Version 26 based on the comprehensive system of analytical tools. Means and standard deviations were also calculated as descriptive statistics of the variables in the study. The Pearson correlation analysis was done to examine the correlation between AI adoption and technological factors. Further, multiple linear regression was employed to determine the technological predictors, which gain the most significant influence on the adoption of AI, and they present a better picture of the comparative effects. Prior to such analyses, the alpha of Cronbach was determined in order to determine reliability and internal consistency. Additionally, the important diagnostic tests on the regression models such as checking the normality and multicollinearity tests were carried out.

4. RESULTS

4.1 Descriptive Statistics

Descriptive statistics which included standard deviation and mean were calculated to study the general status of the study variables. Table 1 displays the results.

Table 1: Summary of Key Variables

Variable	Mean	Std. Deviation
IT Infrastructure	3.43	0.72
Digital Literacy	2.51	0.81
System Compatibility	2.44	0.77
Data Security Concerns	3.26	0.98
Perceived Ease of Use	2.24	0.85
AI Adoption Level (HRM)	2.35	1.02

The sample, as presented in Table 1, has a moderate to low overall position regarding the important variables that affect the use of AI in HRM. The AI Adoption Level score (2.35 on a scale of 5) is the middle result as it suggests that, on average, organisations are at the starting point or the developing phase of incorporating AI in their HR activities. The variables are different in terms of presence or intensity levels. IT Infrastructure (Mean = 3.43) has the elevation as the highest average, indicating a rather sound technological base. Ironically, Digital Literacy (2.51), System Compatibility (2.44), and Perceived Ease of Use (2.24) have a relatively low cluster, which makes them the possible areas of serious concern that should be improved. Interestingly, Data Security Concerns (3.26) has a moderate mean score, which means that the concerns with privacy and risk are high among the participants. These findings reveal that the mean score was the highest in the case of IT infrastructure which is an indication that hardware and network systems are fairly robust. Regardless of the sufficient technological infrastructure, the rates of AI adoption remain low, which is why non-technical aspects should be equally considered, such as the digital literacy of the workforce and psychological confidence.

4.2 Multiple Linear Regression Analysis

A multiple linear regression was carried to establish the effect of technology determinants on the adoption of AI in HRM. The findings are provided in Table 2.

Table 2: Multiple Linear Regression Analysis

Predictor	Unstandardized B	Std. Error	Beta	t	Sig.
IT Infrastructure	0.341	0.079	0.311	4.32	0.000
Digital Literacy	0.228	0.070	0.223	3.26	0.001
System Compatibility	0.157	0.061	0.142	2.57	0.011
Data Security Concerns	-0.109	0.052	-0.098	-2.10	0.037
Perceived Ease of Use	0.167	0.068	0.156	2.45	0.015
Constant	1.215	0.307		3.96	0.000
$R^2 = 0.48$					

Note: Dependent variable = AI Adoption (HRM)

The multiple linear regression analysis, as shown in Table 2, looks at the extent to which five predictor variables affect AI adoption in the HRM. The model results in the model explaining 48% of the variance ($R^2 = 0.48$) in AI adoption which demonstrates a moderately high predictive strength. IT infrastructure (B = 0.341, 0.311 and p =.001) turned out to be the most relevant positive predictor of AI adoption, meaning that one unit of improvement in the quality of infrastructure leads to a 0.341-unit rise in the likelihood of adoption. This observation highlights the fact that IT infrastructure is a key enabler of sustainable digital transformation.

In the same way, digital literacy (B = 0.228, p < .01) was found to be a considerable positive predictor of AI adoption, which means that digital literacy increases the power of organisational innovativeness and sustainable human capital growth. Another important positive predictor was system compatibility (B = 0.157, p =.05) indicating that a well-integrated adoption of new AI tools within the current HR systems is an easy process. Similarly, the perceived ease of use (B = 0.167, p < 0.05) has a positive impact on the adoption; the implication is that easy-to-use systems stimulate the increased use of AI technologies. Conversely, data security issues (B= -0.109, p < 0.05) played a key negative role in predicting AI adoption, and it can be concluded that the issues surrounding privacy and risk are key factors that make AI systems hard to implement. This highlights the need to have ethical AI governance and data protection systems in order to build organisational trust.

5. DISCUSSION

The results of the study determine IT infrastructure to be the most predictive of the adoption of AI in HRM, highlighting the centrality of digital transformation and innovation as the cornerstone of its operation. This observation is also in line with other evidence on Asian emerging economies, where the strong technological infrastructure is a pre-condition of integration of AI on SME-based sectors. As an example, the research conducted in India and China shows that companies that have well-developed digital infrastructure tend to implement AI technologies more frequently and attain greater innovation and productivity (Goswami et al., 2023; Chen et al., 2022). IT infrastructure as a strategic resource in the entrepreneurship viewpoint increases the absorptive capacity of the firm, which means that entrepreneurial organisations like private hospitals can use AI to innovate processes, achieve efficiency, and introduce competitive advantages. In that respect, the results support the opinion that infrastructure investment is not just a technical necessity, but a vital factor of sustainable

entrepreneurial development in emerging and Asian economies.

Digital literacy was also a key positive force in the adoption of AI, and human capital became the key factor of promoting innovation and organisational flexibility. This result corresponds to the findings of the Asian settings and especially South Korea and Singapore, where digital skills of the workforce have a substantial impact on AI adoption and usage behaviour (Kim et al., 2024; Chatterjee et al., 2021). Digital literacy in an entrepreneurial context is known to increase the technological opportunities conductive capacity of firms to identify and capitalize on them, which bolsters the innovation capability and strategic expansion. Besides, a digitally literate workforce leads to inclusive innovation by facilitating a wider engagement in the technological-driven processes and eliminating disparities in expertise. The results imply that the continuous learning and upskilling investments are necessary not only to be able to adopt technology but also to be able to build sustainable and inclusive entrepreneurial ecosystems.

The compatibility of the systems and perceived ease of use were also determined to have positive impacts on the adoption of AI, which proves that the user-centred and integrative technological systems contributed to the ease of transition to the digital HRM practices. The same has been observed in the Southeast Asian economies, with compatibility with the existing system and ease of use a major determinant of AI adoption among SMEs and service organisations (Tanantong and Wongras, 2024; Nguyen et al., 2023). Strategically the factors make organisations more agile and scalable, by allowing the entrepreneurial firms to incorporate new technologies without first discontinuing the current operations. This goes to the argument that introduction of innovation is more efficient when it is coordinated with the existing organisational capacities and processes thus augmenting long term sustainability and competitive power.

On the other hand, the problem of data security was found to be one of the major prohibitors of AI adoption, with an accent on the relevance of trust, ethical regulation, and adherence to regulations. This fact coincides with the literature in the Asian economies such as China or India, where the lack of information privacy, the lack of cybersecurity, and the uncertainty of the regulations are still the key obstacle to the popularization of AI technologies (Zhang et al., 2022; Kshetri, 2021). Regarding the corporate social responsibility (CSR), these concerns should be addressed to guarantee ethical AI utilization and existence of trust among stakeholders. The most effective data governance frameworks, transparency solutions, and privacy-enhancing technologies should be implemented in organisations to reduce risks and promote responsible innovation. Moreover, this inclusion of ethical practices of AI corresponds to the wider sustainability goals, which in turn reinforced the role of AI in helping to enable socially responsible and accountable organisational behaviour.

Notably, the research also mentions the greater implications of AI adoption on the inclusive and sustainable innovation. Although AI can bring a lot to the field of efficiency and decision-making, it is also associated with issues concerning job displacement, digital inequality, and algorithmic bias. Data on economies of the Asia region indicates that the introduction of AI can become the source of increasing inequalities unless proper policy interventions and organisational approaches are adopted (UNESCAP, 2022; Fu, 2021). Nevertheless, AI could sustain responsible development by enhancing accessibility to competencies and job opportunities, increasing service delivery, and expanding equitable distribution of resources in case of responsible implementation. In the case of entrepreneurship, this highlights the importance of a balance between technological development and social responsibility where innovation should be used to add economic and social value to the world.

Generally, the results of this research can be largely attributed to the findings that are found in Asian and other emerging economies where the adoption of AI in HRM is a complex phenomenon that depends on the technological preparedness, human capital, and institutional conditions. As the research places private hospitals in the role of an entrepreneur, it shows that AI usage is a strategic route to the innovation-oriented growth, sustainability, and competitive edge. These comparative lessons also demonstrate the applicability of the results to the Ethiopian context and the Asian economies, in part, in SME-driven sectors, where digital transformation is paramount to their long-term growth (Almarashda et al., 2021; Madanchian and Taherdoost, 2025).

7. CONCLUSION

This paper presents the empirical evidence that AI application in human resource management (HRM) is a decisive factor of sustainable entrepreneurship, innovation, and organisational performance in the emerging economy environments. The paper presents an analysis of the entrepreneurial service business of the private hospitals in Addis Ababa, which serves to demonstrate that technological determinants, specifically IT infrastructure, digital literacy, system compatibility, perceived ease of use, and data security concerns, are a decisive element in determining the outcome of AI adoption. These results confirm that, in addition to technological preparedness, the successful implementation of the AI relies on the compatibility of the human resources, organisational competencies, and ethical governance policies. The research makes a

contribution to the literature on Asian entrepreneurship and innovation in that it provides some comparative insights that can be applicable to SME-led economies with limited resources like India, Indonesia and Vietnam. The findings show that the determinants of AI adoption in Ethiopian context are almost the same as the determinants of AI adoption in Asian emerging market, which supports the generalizability of the results. The research associates the AI-enabled HRM as an innovative-based growth and competitive-based strategic instrument through the integration of technological adoption models and the entrepreneurship and sustainability strategies. Policy wise the findings suggest that emphasis should be given on the establishment of digital infrastructure, training of workforce, and regulation policies that would guarantee intelligent use of AI in a safe and ethical context. There is a need to enhance digital ecosystems, facilitate the innovation of SMEs, and foster the collaboration of the public and the private sector. Policies on data security, privacy, and responsible AI application also present an important measure of establishing trust. In general, AI-based HRM is helpful to the economic efficiency, the sustainability of the environment, and the integration of the society, which becomes a strategic course towards ensuring sustainable development.

6. RECOMMENDATIONS

Based on the findings, the multivariate and multi-level method is required to raise the levels of acceptance of AI in HRM and mainly within the sectors entrepreneurial and SME-based within the emerging and Asian economies. At the policy level, governments should concentrate on investing in digital infrastructure like fast connections, cloud computing, and safe data systems in order to make AI introduce change. Policymakers should also formulate specific incentives that comprise tax benefits, innovation grants and public funding to help SMEs adapt AI technologies. To establish trust and reduce uncertainty, it is essential to establish a set of clear rules that would address the privacy of data, cybersecurity, and ethical AI usage. An entrepreneurship perspective would imply gradual and tactical measures of AI adoption, including making investments in scale-able systems, conducting pilot projects, and assimilating it with the business objectives. The development of the workforce should be on the agenda of the firms that include training programs; they can create digital literacy, data analytics, and AI skills. Human capital must be strengthened in order to encourage innovation and the developability of a competitive advantage. The transfer of knowledge may also be accelerated by collaboration as part of the ecosystem of innovation, by working with technology providers, universities, and startups. In order to create a sustainable and inclusive innovation, organisations need to create alignment between the use of AI and the elements of the ESG by fostering green HRM, minimizing environmental impact, and creating a fair access to AI opportunity. It should be governed by ethical AI which focuses on transparency, accountability and equity. Lastly, policymakers and organisations must encourage cross-country cooperation, in particular, between African and Asian economies, in order to exchange best practices and ensure resilient, inclusive, and sustainable digital development.

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