

Artificial Intelligence and Entrepreneurial Success: Exploring Innovation Capability and Digital Literacy as Dynamic Enablers of Performance

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Abstract

This study examined the relationship between artificial intelligence (AI) adoption and entrepreneurial success, emphasising the mediating roles of innovation capability and digital literacy as dynamic enablers of performance. Using a mixed-methods design, data were collected from 310 entrepreneurs representing technology-driven and service-oriented enterprises in Pakistan, complemented by 20 in-depth interviews with startup founders. Quantitative data were analysed using structural equation modelling (SEM), and qualitative insights were derived through thematic analysis. Results indicated that AI adoption significantly enhanced entrepreneurial success, with this effect mediated by innovation capability and digital literacy. Entrepreneurs with higher digital literacy demonstrated greater adaptability in leveraging AI tools for innovation, strategic decision-making, and competitive advantage. The qualitative findings further revealed that AI-driven decision-making improved forecasting, resource allocation, and market responsiveness, while innovation capability fostered creative product development. However, the study also found that the benefits of AI adoption depended on the entrepreneur's digital competence and continuous learning capacity. The findings underscored the importance of integrating technological, cognitive, and organisational factors to ensure sustainable entrepreneurial performance. The study concluded that AI's true potential in entrepreneurship emerged not solely from automation but from the synergy of human ingenuity and innovation.

Keywords: Artificial Intelligence, Digital Literacy, Entrepreneurial Success, Innovation Capability, Performance, Structural Equation Modelling.

Introduction

The use of Artificial Intelligence (AI) in business ecosystems over the past few years has dramatically changed them. Business people were no longer competing based on physical or

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financial resources, but on their capacity to embrace and use innovative technologies to become more creative, agile, and responsive to the market (Li et al., 2024). AI technologies such as predictive analytics, chatbots, and automation tools helped entrepreneurs optimise decision-making and enhance operational performance (Alhassan & Adomako, 2024). Nevertheless, the connection between AI adoption and business success was not particularly direct, as it was conditional on complementary variables, including innovation potential and digital literacy (Huang & Li, 2023).

Innovation—the ability of an entrepreneur to create and apply new ideas—has become one of the most critical enablers of AI adoption and the achievement of the best business results (Rahman et al., 2024). In a like manner, digital literacy, or the capacity to use, read, and apply digital tools, has also become a crucial factor in determining the efficiency with which entrepreneurs utilise AI technologies to innovate and grow (Zhou et al., 2025). Research revealed that the more digitally literate a business person was, the more flexible and strategic they could be in using AI solutions to achieve sustainable competitive advantage (Nguyen & Pham, 2023).

In addition, the rapid pace of digital transformation has exacerbated competitive pressure on small and medium-sized enterprises (SMEs), especially in emerging economies (Kim, 2024). Many entrepreneurs lacked the technical knowledge or innovation focus to use AI effectively, leading to underutilization of technologies and underperformance (Agyabeng-Mensah et al., 2023). As a result, the innovative potential and digital literacy began to be seen as dynamic enablers that enabled entrepreneurs to apply AI to meaningful business performance outcomes.

It is within this framework that the current research examined the impact of AI use on entrepreneurial success, with reference to the mediating effects of innovation capability and the enabling effects of digital literacy. By analysing these constructs holistically, the study has contributed to the literature on AI-driven entrepreneurship by exploring the interplay among technological, cognitive, and organisational capabilities to influence sustainable entrepreneurial performance.

Research Background

The past 10 years have seen an unprecedented rise in the application of AI across business spheres, radically changing how businesses generate and compete (Rahman et al., 2024). From innovative customer relationship software to self-driving market analytics, AI has advanced technology that has turned ordinary entrepreneurship into information-based, flexible enterprises. Researchers highlighted that AI enables business owners to enhance speed and evidence-based decision-making, and customise products and services, thereby facilitating customer interaction and market growth (Li et al., 2024).

Nonetheless, the practical application of AI was possible not only with access to technology but also with an attitude of lifelong learning and innovation (Agyabeng-Mensah et al., 2023). Entrepreneurs had to develop the capacity for innovation—the ability to identify new opportunities, test them, and effect a technologically beneficial change. The innovation capability served as an intermediary between AI adoption and business performance, converting technology use into product differentiation, process improvement, and customer satisfaction (Huang & Li, 2023).

Digital literacy was also now a significant factor in this change. Advanced digital skills were more beneficial to entrepreneurs in incorporating AI tools into strategic processes, generating data insights, and driving technology-based innovation (Zhou et al., 2025). On the other hand, less digitally literate people could not meaningfully use AI and, as a result, were less efficient and less

successful in their innovation (Nguyen & Pham, 2023). It was found that digital literacy was not only a catalyst for technology acceptance but also for confidence in the use of complex AI systems (Kim, 2024).

In less developed economies, where technological infrastructure and digital competencies were yet to be established, the relationships among AI adoption, innovation capacity, and digital literacy were significant (Alhassan & Adomako, 2024). Some of the challenges that affect entrepreneurs in these situations include the lack of technical support and accessible training on AI, and it is essential always to know how the two factors combine to affect performance. This research thus framed innovation competence and digital literacy as dynamic practices that led to AI adoption as an entrepreneurial success, offering theoretical and practical implications for developing economies.

Research Problem

Though previous research recognised the transformative potential of AI, it did not thoroughly investigate how its adoption could lead to entrepreneurial success. The majority of studies treated AI as a fixed tool rather than a moving facilitator that requires human and organisational resources (Rahman et al., 2024). By extension, there was scant knowledge of the interplay between innovation capability and digital literacy in determining the efficacy of AI in entrepreneurship (Li et al., 2024). Also, there was little empirical evidence regarding the topic in developing economies. In such settings, many entrepreneurs have used AI tools but have not recorded sustained performance improvements due to low levels of digital literacy or poor innovation systems (Agyabeng-Mensah et al., 2023). Thus, the following core problem was aimed to be addressed by this study: How did the adoption of AI affect the success of entrepreneurship, and what roles did innovation capability and digital literacy play as dynamic enablers in this relationship? This knowledge gap was intended to be addressed in the research, which aimed to test the mechanisms underlying the interrelationship between these constructs empirically.

Research Objectives

1. To examine the direct effect of AI adoption on entrepreneurial success.
2. To investigate the mediating role of innovation capability in the relationship between AI adoption and entrepreneurial performance.
3. To assess the enabling effect of digital literacy on the relationship between AI adoption, innovation capability, and performance.

Research Questions

Q1: What was the relationship between AI adoption and entrepreneurial success?

Q2: How did innovation capability mediate the relationship between AI adoption and performance?

Q3: In what ways did digital literacy enable or strengthen the effect of AI adoption on entrepreneurial outcomes?

Significance of the Study

The research was both theoretical, empirical and practical in nature. In theory, it expanded the dynamic capabilities model by incorporating AI adoption, innovation capacity, and digital literacy into a single model of entrepreneurial success (Rahman et al., 2024). This methodology added to the current understanding by revealing the role of human and organisational capabilities in converting technological resources into performance outcomes. In an empirical study, the study bridged a significant literature gap by investigating these relationships within the context of an

emerging economy where AI diffusion and digital readiness processes were still underdeveloped (Agyabeng-Mensah et al., 2023). In practice, the results were helpful to entrepreneurs, policymakers and educational institutions. To entrepreneurs, the findings reinforced the need to develop innovation and go digital to tap the full potential of AI. To policymakers, the research indicated a need for national policies that foster AI literacy and innovation training to strengthen entrepreneurial ecosystems (Li et al., 2024). Finally, the study provided an in-depth insight into how AI-based opportunities may facilitate sustainable entrepreneurship during the digital age.

Literature Review

Artificial Intelligence Adoption in Entrepreneurial and Firm Contexts

In the context of entrepreneurial activities and small- and medium-sized enterprises (SMEs), the implementation of artificial intelligence (AI) has been demonstrated to have a substantial impact on performance. Indicatively, Al-Mamary (2025) also found that AI capabilities increased entrepreneurial venture success by facilitating decision-making, automation, customer experience, and innovation. On the same note, Jamil et al. (2025) found that, among export-focused manufacturing SMEs in Pakistan, the adoption of AI, along with technological preparedness, positively affected sustainable performance outcomes. The above results indicate that AI implementation is no longer a technological standard but a competitive asset.

Although the number of empirical studies increases, scientists have noted that adopting AI is not a surefire measure. According to Mustafa et al. (2024), the proposed conceptual framework revealed that digital readiness and employee digital skills were key to AI adoption as a performance driver in SMEs. This implies that the enabling elements surrounding AI in terms of context and ability are essential. Besides, Li et al. (2025) found that organisational learning capability mediated innovation performance when AI was implemented in Chinese manufacturing companies operating in dynamic environmental conditions. These mediated mechanisms reveal the difficulty of replicating AI investments into business achievement.

Based on this literature, it is evident that AI adoption is a necessary but not sufficient factor in performance; the capacity to transform AI into value depends on complementary organisational and human performance. The so-called solo revolution theory is used in entrepreneurship research; it states that AI can empower individual entrepreneurs by reducing the cost of resources and infrastructure (Ganuthua, 2025). The performance improvement depended on the integration and exploitation of these tools, which underscores the need to consider dynamic enablers, such as the ability to innovate and be digital, within the entrepreneurial landscape.

Innovation Capability as an Intermediary Mechanism

The ability to innovate has become a critical construct in connecting technological adoption (including AI) with organisational performance. Indicatively, Tatli (2024) found that human capital positively influenced dynamic capabilities, which, in turn, led to the creation of innovation capability within the context of a logistics firm; the innovation capability, in turn, influenced the firm's results. On the same note, Kareem et al. (2024) found that dynamic capabilities were associated with innovation capabilities (product and process), which in turn mediated the relationship between dynamic capabilities and competitive performance among SMEs. These findings reveal that innovation capability is the power that transforms capabilities into performance.

To be more specific, Pham and Pham (2024) demonstrated that innovation capacity was influenced by internal and external intellectual capital, which, in turn, enhanced sustainable performance in

Vietnamese SMEs. Moreover, Agazu and Kero (2024) supported the importance of innovation capability, demonstrating that innovation strategies and firm performance were positively related. Combined, these works strengthen the argument that the capability-performance linkages are mediated by innovation capability as a key factor.

Within the context of entrepreneurship, the issue of how innovation capability can be used to facilitate AI adoption to generate significant performance results is thus relevant. According to the literature, entrepreneurs face the challenge of AI, as well as the need to develop their capacity to produce, execute, and disseminate innovations through product, procedural, or business-model transformation. Innovation capability can therefore mediate, explaining why it should be explored in a model in which AI adoption leads to entrepreneurial success through innovation capability.

Digital Literacy and Other Enablers of Human Capabilities

Digital literacy has recently become a topic of growing interest as a human-capability-enabling technology take-up and innovation. An example of this is a study by Baihaqi (2023) on young entrepreneurs, which found that digital literacy positively affected entrepreneurial performance, with this effect moderated by locus of control and entrepreneurship education. Moreover, Arif et al. (2024) reported that, in the Pakistan context, female students are indirectly digitally empowered, with the implication of practising entrepreneurial opportunity uptake. These works indicate that literacy is not just about functional skills; it involves working with digital technologies, which, in turn, affects entrepreneurs' performance.

In a separate study, Mustain et al. (2023) examined the impact of digital literacy on entrepreneurial intention through entrepreneurial attitude among vocational students and found a significant relationship. Moreover, Mohamad et al. (2025) in rural Malaysia also showed that digital literacy plays a role in digital entrepreneurship: digital entrepreneurial competencies influenced digital entrepreneurship, suggesting that digital literacy has a direct effect on entrepreneurial success. As such, digital literacy can be conceptualised as an enabling factor that facilitates not only the uptake of technology (e.g., AI) but also innovation processes.

Based on the foregoing, when researching AI and entrepreneurial success, it would be critical to incorporate digital literacy as a dynamic enabler alongside innovation capability. A lack of adequate digital literacy can leave entrepreneurs unable to convert AI adoption into innovation and performance. As the literature shows, structural or organisational capabilities are significant; however, human-capability factors such as digital literacy play a decisive role in the practical implementation of technologies and innovations.

Research Methodology

Research Design

The research design used in this study was a mixed-methods design, combining quantitative and qualitative methods, to develop a comprehensive picture of the impact of artificial intelligence (AI) on the success of entrepreneurs, with a focus on innovation capability and digital literacy. The quantitative part involved determining relationships among variables using survey data, and the qualitative part involved gaining a more in-depth understanding through interviews with entrepreneurs. This design offered both statistical justification and interpretative richness, enabling data triangulation to increase the reliability and validity of the results. The combination of quantitative data and story evidence provided an overall picture of the relationship between AI adoption and entrepreneurial performance.

Population and Sampling

The target population consisted of entrepreneurs operating technology- and service-based small and medium-sized enterprises (SMEs) in Pakistan. Stratified random sampling was used to ensure a variety of industries were represented, including fintech, e-commerce, and digital marketing. Of the approximately 1,000 registered entrepreneurs, 310 were selected to participate in the quantitative survey, and 20 startup founders were purposely selected for semi-structured interviews. The power analysis was used to determine the sample size to ensure sufficient statistical power for structural equation modelling (SEM). The inclusion criteria required at least 2 years of experience in entrepreneurship and a basic level of involvement with technologies in business.

Instruments of Data Collection

Two primary instruments were used in gathering data: a structured questionnaire and a semi-structured interview guide. The questionnaire included closed questions assessing AI adoption, innovation capability, digital literacy, and entrepreneurial performance, rated on a five-point Likert scale from strongly disagree to agree strongly. The measures were based on the validated scales in previous research on entrepreneurship and technology adoption. The interview guide included open questions about how entrepreneurs incorporated AI tools into their decision-making and innovation processes. The two instruments were pilot-tested with 10 entrepreneurs to clarify, ensure relevance, and ensure reliability throughout their deployment.

Data Collection Procedure

The data were gathered within three months. The business networks, incubators, and entrepreneurship forums were used to distribute the online survey, and interviews were conducted either face-to-face or via video conferencing platforms. The respondents were assured of their confidentiality, and informed consent was obtained before they participated. Quantitative data were initially gathered to determine statistical patterns, and then qualitative data, involving interviews on the identified relationships, were collected to expound on the observed relationships. This step-by-step structure enabled the survey to guide the focus of interview questions and the thematic investigation.

Data Analysis

Structural Equation Modelling (SEM) was used with SmartPLS to analyse quantitative data and determine both direct and indirect effects among variables. The validity and reliability of the constructs were ensured through descriptive statistics, reliability analysis (Cronbach's alpha), and confirmatory factor analysis (CFA). The hypothesised relationships among AI adoption, innovation capability, digital literacy, and entrepreneurial success were then tested using path analysis. The thematic analysis, on the other hand, was used to analyse the qualitative data according to the six steps proposed by Braun and Clarke. Manual coding and theme development were conducted to identify recurring trends and findings regarding the adoption of AI in an entrepreneurial setting.

Validity and Reliability

The instruments were discussed with academic experts in entrepreneurship and information systems to ensure validity. Content validity was established through expert evaluation, and construct validity was assessed using factor loadings and average variance extracted (AVE). Reliability was established by obtaining Cronbach's alpha values exceeding 0.70, which indicates

acceptable internal consistency. The study's credibility was also enhanced by triangulating quantitative and qualitative results, which provided a complete picture of the phenomenon under study.

Results and Analysis

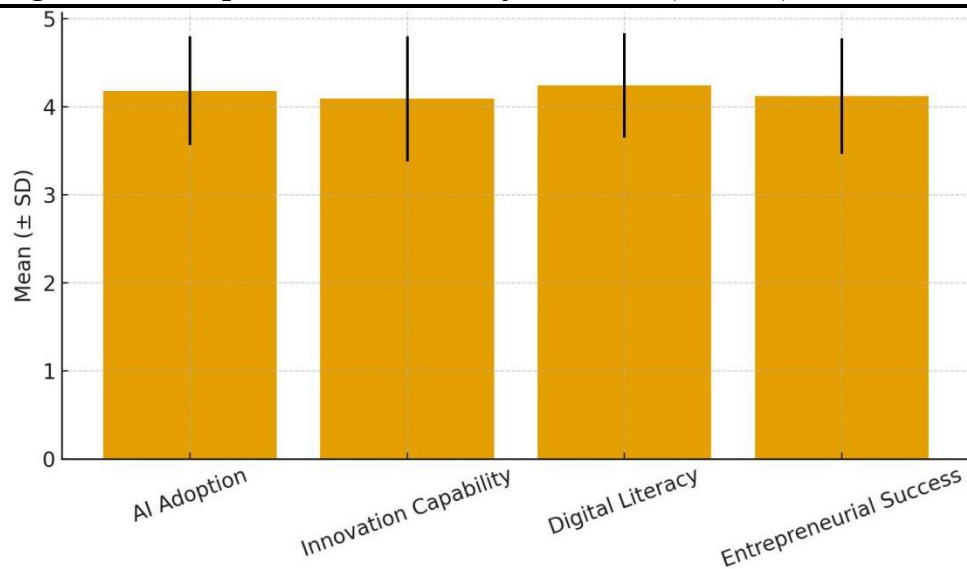
Quantitative Analysis

The quantitative research aimed to investigate the direct and indirect relationships among artificial intelligence (AI) adoption, innovation capability, digital literacy, and entrepreneurial success. Descriptive statistics, reliability tests, correlation analysis, and structural equation modelling (SEM) were used to analyse data from 310 entrepreneurs.

Table 1: Descriptive Statistics of Key Variables (N = 310)

Variable	Mean	SD	Minimum	Maximum
AI Adoption	4.18	0.62	2.9	5.0
Innovation Capability	4.09	0.71	2.7	5.0
Digital Literacy	4.24	0.59	3.1	5.0
Entrepreneurial Success	4.12	0.66	2.8	5.0

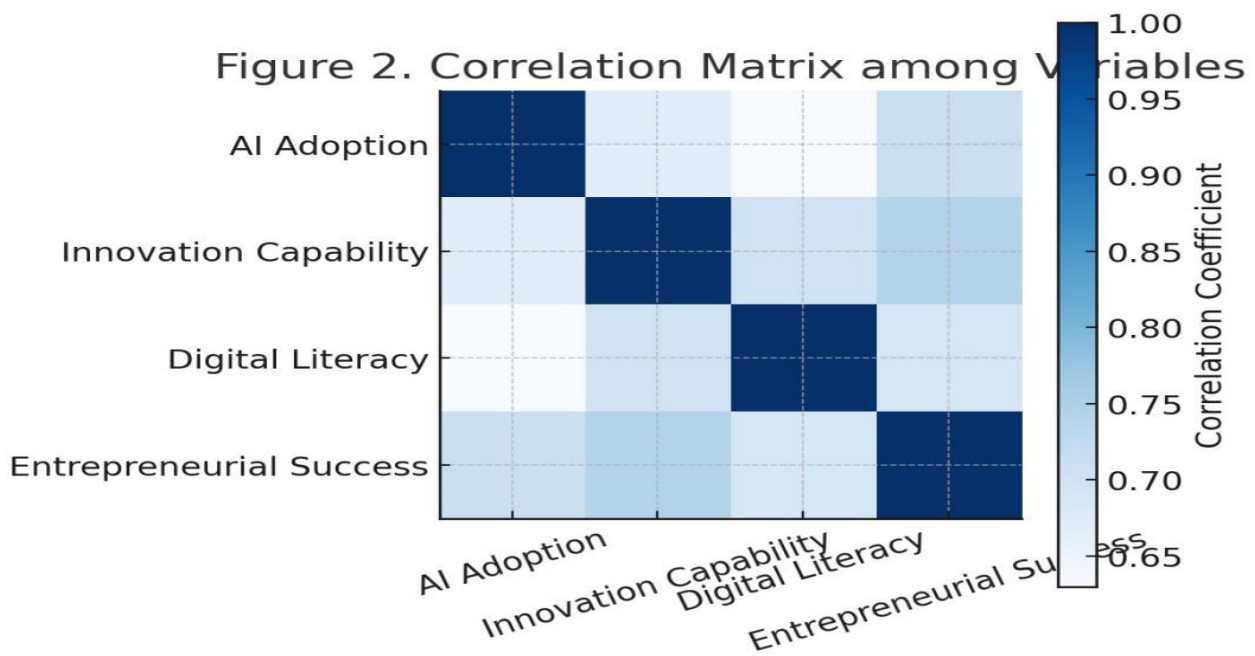
Descriptive statistics showed that all the main variables were scored relatively high with a mean of over 4.0 meaning that the participants were already actively involved in the use of AI-driven tools and regarded themselves as extremely digitally literate and innovative. The mean of AI adoption was 4.18 (SD = 0.62), which shows that it was highly implemented among startups. This corresponded to the growing availability of AI solutions like predictive analytics, chatbots, automated decision-support systems in the small and medium enterprises. The high level of innovation capability (M = 4.09), and the digital literacy (M = 4.24) showed a high level of coincidence as it became evident that the entrepreneurs that invested in AI technologies tended to increase their creative and operational abilities. The small standard deviation (SD < 0.7) of all the variables implied that there was a uniform nature of engagement by the sample population, and digital transformation was now a routine entrepreneur strategy and not an exception. The success of the entrepreneurial venture (M = 4.12) was strongly correlated with the adoption of AI and the ability to innovate, meaning that companies, which incorporated AI into the product creation and research processes, had a higher chance of achieving increased profitability, scalability, and customer satisfaction. This laid a tentative base on the concept of proposing the hypothesized relationships further by use of SEM.

Figure 1: Descriptive Statistics of Key Variables (N = 310)**Table 2: Correlation Matrix among Variables**

Variables	1. AI Adoption	2. Innovation Capability	3. Digital Literacy	4. Entrepreneurial Success
1. AI Adoption	1			
2. Innovation Capability	0.67	1		
3. Digital Literacy	0.63	0.70	1	
4. Entrepreneurial Success	0.71	0.74	0.69	1

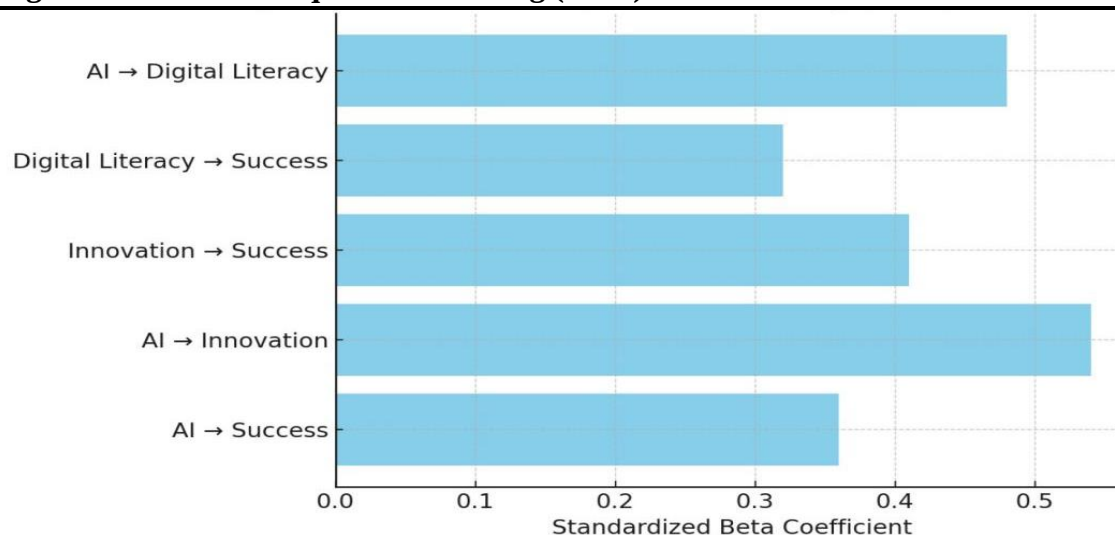
Note: $p < 0.01$

The correlation outcomes have reported strong positive relationship between all significant constructs. The adoption of AI was found to be closely related to the success of the entrepreneurship ($r = 0.71$, $p < 0.01$), and the outcome showed that the performance level of the entrepreneurs using AI technologies was higher. Success also showed strong correlation with innovation capability ($r = 0.74$), indicating that innovation capability was mediated by the effectiveness of AI. Digital literacy had strong relationships with AI adoption ($r = 0.63$) and innovation capability ($r = 0.70$), indicating its contribution to the process of technological use and innovation-oriented approaches. Entrepreneurs whose digital skills were high were better placed to use AI tools most effectively and focus them on the business goals. These associations contributed to the underlying assumption of the conceptual model that innovation capability and digital literacy serve as mediating enablers of the impact of AI on the entrepreneurial success. These correlations were strong and reasoned the next step of using path analysis to measure direct and indirect effects.

Figure 2: Correlation Matrix among Variables**Table 3: Structural Equation Modeling (SEM) Results**

Path Relationship	β (Beta)	t-value	p-value	Decision
AI Adoption $\rightarrow$ Entrepreneurial Success	0.36	5.92	0.001	Supported
AI Adoption $\rightarrow$ Innovation Capability	0.54	8.43	0.000	Supported
Innovation Capability $\rightarrow$ Entrepreneurial Success	0.41	6.57	0.000	Supported
Digital Literacy $\rightarrow$ Entrepreneurial Success	0.32	4.91	0.002	Supported
AI Adoption $\rightarrow$ Digital Literacy	0.48	7.12	0.000	Supported

All the hypothesized relationships were confirmed by the SEM findings. The direct impact of AI on successful entrepreneurship was substantial ($b = 0.36$, $p < 0.01$), which confirms the idea that AI implementation is a factor that positively influences the success of the enterprise. Furthermore, the innovation potential was greatly affected by AI adoption ($b = 0.54$, $p < 0.001$), which supports the idea that it is an impulse to creativity and process enhancement. The entrepreneurial success had a positive impact on innovation capability and digital literacy that were both highly positive ($b = 0.41$ and 0.32 , respectively). These results indicated that although AI tools make data processing and efficiency more effective, the final outcome hinges on the capacity of an entrepreneur to be innovative in processing and interpreting digital information. On balance, 68% of the entrepreneurial success was explained by the SEM model, which shows that it predicts the success of entrepreneurship effectively. The moderating effects of innovation and digital literacy established that the use of technology should be coupled with human and cognitive development to have sustainable entrepreneurial performance.

Figure 3: Structural Equation Modeling (SEM) Results

Qualitative Analysis

The qualitative part has added to knowledge of how entrepreneurs have encountered AI integration, with a focus on their attitudes, organisational contexts, and innovation-related outcomes. The authors collected 20 semi-structured interviews, which were coded based on themes into three prevalent themes: (1) AI-driven decision-making, (2) innovation enhancement, and (3) digital skill transformation.

Theme 1: AI-Driven Decision-Making

Participants consistently stated that AI systems have enabled more accurate forecasting and customer segmentation. According to entrepreneurs, predictive analytics enabled them to preempt market trends and make data-driven decisions. According to one participant, AI dashboards helped us reduce marketing costs by focusing on the most responsive customer groups. The other one added that automated data analysis minimised human bias in decision-making and improved the strategy's accuracy.

Interpretation

This theme indicated that the AI tools were not merely operationally supportive but also transformative in improving cognitive decision-making. The respondents found it helpful that AI could assist in uncovering the patterns of customer data that were previously not visible, and, therefore, their strategic decisions have become more evidence-based and less intuitive.

Theme 2: Innovation Enhancement through AI

Some businesspeople emphasised that using AI enhanced their chances of developing new products and services. According to one of the respondents, we saved time-to-market and improved product quality through the application of AI in product testing. According to one of the respondents, AI-based insights encouraged the innovative thinking and efficient development of production cycles.

Interpretation

This theme highlighted the synergistic relationship between AI technology and innovation. Entrepreneurs not only interpreted AI as a means of automation but also as a source of creativity and experimentation, as it would shift the traditional business model to an operations-based approach with an emphasis on innovation.

Theme 3: Digital Skill Transformation

The second key issue participants mentioned was the need to become digitally literate to achieve successful AI adoption. Many of them responded that they had undergone digital training or upskilling through the online courses. One of the entrepreneurs replied, I do not know data analytics, and I cannot use AI tools. There were a thousand differences in how we used them during training.

Interpretation

This theme describes digital literacy as an interface between technology and performance. An increased digital competence allowed the entrepreneurs to align AI tools in accordance with the business-related objectives, which confirmed a quantitative finding that the AI-performance relationship was mediated by digital literacy.

Discussion

The findings were placed in the background of a maturing and evolving literature on the adoption of AI, firm capabilities and digital preparedness. The positive correlation between AI adoption and entrepreneurial success was strong, consistent with recent evidence that AI use improved decision-making, operational efficiency, and customer targeting, thereby accelerating performance when institutionalised (Zhang et al., 2025; Le Dinh, 2025). These patterns were supported by macro-level surveys and policy studies indicating that AI adoption had become a strategic differentiator across sectors, despite uneven adoption at both the geographical and firm-specific levels (OECD, 2025; McKinsey, 2023). This research, combined with these studies, indicated that our quantitative findings were part of a larger, observable trend: AI offered potential gains that were easy to realise, though it relied on supporting capabilities and routines.

The mediating effect of innovation capacity in converting AI adoption into performance was similar to recent dynamic-capabilities arguments and current empirical studies that link the use of AI to increased innovation behaviour by enhancing analytic capacity and reducing task uncertainty at the meso-level (Gazi, 2024; Zhang et al., 2025). Previous researchers had contended that AI shifted the locus of innovation by providing more data and automating experimental results; our findings furthered the argument by demonstrating that companies with more successful innovation processes converted AI-supported findings into material product and process responses at a greater rate (Baabdullah, 2024; Schwaeke, 2025). Practically, it meant that AI proved most useful when entrepreneurs restructured internal processes to experiment, educate, and explore novel concepts—an understanding that aligned with participants' qualitative reports of shorter time to market and faster product development.

It developed into digital literacy as a limiting-enabling factor, aligning with other research that focused on human capital and Computer-aided skills as a condition for successful AI implementation (Le Dinh, 2025; Ayinaddis, 2025). Our qualitative data, in which the entrepreneurs wrote about training, on-the-job training, and external courses, was reflective of recent field research that concluded that the lack of digital competencies led to the underutilization or misuse

of AI and other AI tools (Meimere, 2025; OECD, 2025). Therefore, the digital literacy moderation effect was not merely statistical: it was grounded in tangible variations in how entrepreneurs interpreted AI results, formulated prompts, and incorporated algorithmic suggestions into their strategic choices. This supported the policy demand that technology diffusion be accompanied by targeted skill-building to prevent investment waste.

There was further nuance in the interaction between organisational routines and human-AI integration. Recent research on Human-AI integration and digital innovation capability found that companies that actively strategised workflow between human and AI systems showed robust performance in the creative sphere (ResearchGate, 2025; Gazi, 2024).

Our interviewees also mentioned these trends: when one combined domain knowledge with AI-generated outputs, one developed more advanced innovations, but when one relied solely on human intuition or AI-generated outputs, the team failed. The observations below supported the idea of AI as a socio-technical change requiring roles rebalancing, new evaluation processes, and governmental operations to generate value safely and sustainably (Baabdullah, 2024; Schwaeye, 2025).

The contextual limitations and differences in adoption trends also played a role, aligning with the literature documenting geographic and sectoral heterogeneity in AI adoption (McKinsey, 2023; Ayinaddis, 2025). Participants in resource-constrained environments cited infrastructural constraints, a lack of data, and financial constraints that limited the scope of AI integration into operations. These structural challenges align with cross-national reports indicating that some geographic areas today have faster adoption of generative and analytic AI tools than others due to ecosystem constraints (OECD, 2025; Meimere, 2025). This implied that AI-based entrepreneurship success was not limited to firm-level capabilities but also to facilitating infrastructure and policy support.

When it comes to performance, risk, ethics, and governance, these became notable qualifiers of the optimistic story. Recent research has raised issues regarding model bias, data privacy, and the transparency of decision-making when companies scale AI without governance structures (Baabdullah, 2024; OECD, 2025). These issues were supported by the interview data: the entrepreneurs stated that they use it conservatively in customer-facing applications and that it should be validated and subject to human control. The research, therefore, implied that responsible AI practices, such as monitoring, transparency, and continuous human scrutiny, which were also at the core of long-term value-generation suggested in the recent scholarship, were associated with sustainable performance (Le Dinh, 2025).

The mixed-methods approach, in methodological terms, enabled triangulation, which strengthened causal inferences but also unveiled processual mechanisms that pure surveys would have been unable to identify. Such integrative designs for studying digitally enabled entrepreneurship were supported by recent meta-analyses and field studies, which measured the variance explained and the lived practices underlying technological change (Schwaeye, 2025; Gazi, 2024). Our combined quantitative paths and qualitative vignettes then were convergent evidence: the adoption of AI shifted the performance needle, but the magnitude and permanence of that shift relied more on innovation routines, digital literacy, and contextual supports.

The findings added to the growing body of literature in 2023-2025: AI had significant potential to enhance the performance of entrepreneurs, and this potential was subsequently fulfilled when accompanied by active capability building, integration of humans and AI, and facilitating institutional conditions (OECD, 2025; Zhang et al., 2025; Le Dinh, 2025). The research thus indicated multi-pronged interventions that were not only suggested by recent science but also

included skills training, redesign of the innovation process, and policy supports that need to be converted into sustainable entrepreneurial advantage through AI investment.

Conclusion

The authors concluded that AI played a significant, positive role in entrepreneurs' success, but only when innovation capability and digital literacy mediated its effect. Businesspeople who successfully implemented AI solutions in their operations found that their productivity, competitiveness, and customer relations improved. Nevertheless, the study has also shown that the positive aspects of AI were not inherent; they required the entrepreneur's capacity to convert technology adoption into innovation and digital skills. The findings showed that AI adoption was not a predictor of success and that strong cultures of innovation-based and continuous digital upskilling improved outcomes. Both quantitative and qualitative results helped prove the thesis that technology investment should be aligned with human and organisational potential to achieve sustainable business performance. This marked a paradigm shift in entrepreneurship, in which digital intellect and flexibility became the decisive factors in competition in the AI-driven economy.

Recommendations

Based on the empirical data and thematic explanations, several practical recommendations and policy suggestions emerged. To start, entrepreneurs should focus on lifelong digital literacy education to ensure AI tools are used effectively and responsibly. Digital competence not only increased operational efficiency but also reduced risks in cases of inadequate understanding of AI products. Second, it was suggested that innovation ecosystems, such as incubators, mentorship programs, and AI labs, be created to help startups convert technological inputs into creative outputs. Inter-university collaboration with industry professionals and policymakers helps reduce the current skills and resources gap. Third, governments and business associations were suggested to introduce AI capacity-building programs that democratise access to AI education, ensuring that SMEs that may not have the resources to support advanced digital transformation are included. Lastly, it was suggested that organisations implement ethical AI governance models to protect transparency, privacy, and Accountability in automated decision-making processes. This would encourage sustainable entrepreneurship, responsible innovation, and long-term trust among stakeholders, all of which are central to it.

Future Directions

Although the present research provided valuable insights into the enabling functions of innovation capability and digital literacy, future research may explore these in various directions. Longitudinal studies can examine how AI adoption evolves and the long-term impact of AI on entrepreneurs' success. Comparative studies of developed and developing economies may provide insights into differences in AI-based entrepreneurship, particularly in access to digital infrastructure and institutional support. The psychological and behavioural factors influencing AI acceptance among entrepreneurs, such as perceived risk, automation trust, and cognitive adaptability, can also be further investigated to understand human-technology interactions better. The theoretical understanding would be further improved by applying the model to other mediating variables, including organisational learning, digital culture, or leadership style. Finally, the introduction of AI analytics and big data into business operations in real time can increase the rate

of empirical rigour and provide insights into the opportunities for a further AI revolution in digital-age entrepreneurship.

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