

Artificial Intelligence Adoption Among Entrepreneurs in Saudi Arabia: A Secondary Data Analytical Perspective

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Abstract:

This study examines the factors shaping artificial intelligence (AI) adoption among entrepreneurs in Saudi Arabia through an integrated secondary- data analytical perspective. Drawing on the Global Entrepreneurship Monitor (GEM, 2023), the World Bank Digital Adoption Index (2022), and the OECD AI Readiness Indicators (2023), the study synthesizes evidence across technological, institutional, and entrepreneurial capability dimensions. The findings indicate that Saudi Arabia has developed a strong enabling environment for AI adoption, supported by advanced digital infrastructure, robust public digital services, active policy support, and a national AI strategy aligned with Vision 2030. At the entrepreneurial level, Saudi entrepreneurs demonstrate comparatively strong digital skills and increasing use of digital tools, data analytics, and AI- enabled applications, particularly in customer engagement and marketing functions. Institutional readiness emerges as the most influential enabler of AI adoption, while technological readiness and entrepreneurial capabilities further reinforce adoption.

Overall, the study contributes an integrated conceptual explanation of AI adoption in an emerging digital economy and offers implications for policy design, capability development, and entrepreneurial ecosystem strengthening.

Jel Classification Codes: L26, O33, O57, M15, O32, C80

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1. INTRODUCTION

Saudi Arabia has positioned digital transformation at the center of its national development agenda, and artificial intelligence (AI) has become one of the Kingdom's most strategic technological priorities. Within Vision 2030, AI is framed not merely as a technical upgrade but as a foundational enabler of productivity, innovation, competitiveness, and entrepreneurial growth (SDAIA, 2025; Saudi Vision 2030, 2024). Recent national reports highlight that Saudi Arabia is among the fastest advancing digital economies globally, driven by large scale investments in cloud infrastructure, data governance, and AI enabled public services (OECD, 2024; World Bank, 2025). This policy orientation makes the Saudi context particularly compelling for examining how entrepreneurs adopt and use AI in practice.

AI is increasingly embedded in entrepreneurial activities such as customer interaction, marketing automation, predictive analytics, workflow optimization, and data driven decision making. For entrepreneurs especially those operating with limited resources AI can reduce transaction costs, enhance responsiveness, and strengthen market competitiveness. Empirical evidence shows that AI adoption improves startup performance, market reach, and operational efficiency in emerging economies (Alzahrani et al., 2025; JBR, 2024). In Saudi Arabia specifically, AI enabled tools have been linked to improved customer acquisition, productivity gains, and revenue growth among small businesses and startups (JISEM, 2025; CCSNet, 2020).

Despite rapid national progress, research on AI adoption among entrepreneurs in Saudi Arabia remains limited. Existing studies often focus on organizational digital transformation or public sector innovation, while the entrepreneurial dimension receives comparatively less scholarly attention. This gap is significant because entrepreneurial firms typically face greater uncertainty, fewer internal resources, and stronger dependence on external institutional support than large firms. Understanding AI adoption in this context therefore requires an integrated perspective that considers technological readiness, institutional support, and entrepreneurial capabilities simultaneously.

Given the rapid evolution of Saudi Arabia's entrepreneurial ecosystem, secondary data provide a valuable lens for capturing national level patterns that cannot be observed through small scale primary studies. High quality datasets such as GEM (2023), the World Bank Digital Adoption Index (2022), and the

OECD AI Readiness Indicators (2023) offer internationally comparable measures of digital capability, institutional readiness, and AI related infrastructure. These datasets have been widely used in recent global research to assess digital transformation and AI adoption across countries (UNESCO, 2024; OECD, 2024).

Accordingly, this study synthesizes evidence from GEM, the World Bank, and the OECD to develop an interpretive, macro level explanation of AI adoption among entrepreneurs in Saudi Arabia. By integrating technological, institutional, and capability-based dimensions, the study provides a comprehensive understanding of how national digital readiness and entrepreneurial capabilities interact to shape AI adoption in an emerging digital economy.

2.Literature Review

2.1 Digital Entrepreneurship

Digital entrepreneurship has become a central theme in contemporary innovation research, reflecting the growing reliance on digital technologies in opportunity recognition, business model design, and venture scaling. Scholars argue that digital entrepreneurship represents a structural shift rather than a simple technological enhancement, as digital platforms, cloud computing, and data-driven tools fundamentally reshape how entrepreneurs identify and exploit opportunities (Nambisan et al., 2024). In emerging economies, digital entrepreneurship plays a particularly important role by lowering entry barriers, enabling resource-lean scaling, and supporting economic diversification (UNCTAD, 2025). In Saudi Arabia, the rapid expansion of digital infrastructure and government-led innovation programs has accelerated the transition toward digitally enabled entrepreneurial activity (SDAIA, 2025).

2.2 Artificial Intelligence Adoption in Entrepreneurial Contexts

Artificial intelligence has emerged as a transformative force within entrepreneurial ecosystems. AI-enabled tools such as machine learning, natural language processing, and predictive analytics allow entrepreneurs to automate routine tasks, enhance customer engagement, and make more informed strategic

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decisions. Research shows that AI adoption is shaped by perceived usefulness, ease of use, trust, and technological readiness (Davis, 1989; Venkatesh et al., 2003). Recent studies highlight that entrepreneurs adopt AI when it offers visible performance gains, reduces uncertainty, and aligns with their digital capabilities (JBR, 2024; Scientific Reports, 2025). Evidence from Saudi Arabia indicates that AI tools support startup growth by improving customer acquisition, productivity, and revenue generation (Alzahrani et al., 2025; JISEM, 2025).

2.3 National Digital Readiness and Institutional Support

National digital readiness plays a critical role in shaping the extent to which entrepreneurs can adopt advanced technologies. Countries with strong digital infrastructure, supportive regulatory frameworks, and national AI strategies tend to exhibit higher levels of AI adoption across sectors (OECD, 2024). Institutional support including digital public services, data governance, cloud infrastructure, and AI-focused policy initiatives creates enabling conditions that reduce barriers to adoption (World Bank, 2025). In Saudi Arabia, SDAIA's national mandate and the implementation of the National Strategy for Data and AI have positioned the Kingdom among the leading digital economies globally (SDAIA, 2025). These institutional enablers are particularly important for entrepreneurs, who often depend on external support to overcome resource constraints and technological uncertainty.

2.4 Entrepreneurship in Saudi Arabia

Saudi Arabia has experienced a notable rise in entrepreneurial activity over the past decade. According to GEM (2023), the Kingdom ranks among the top countries in perceived entrepreneurial opportunities, government support, and digital capability among early-stage entrepreneurs. The expansion of digital infrastructure, the growth of innovation hubs, and the national emphasis on digital

transformation have contributed to the emergence of a dynamic entrepreneurial ecosystem (Saudi Vision 2030, 2024). However, despite these advancements, research examining AI adoption specifically within the Saudi entrepreneurial context remains limited. Existing studies tend to focus on broader digital transformation trends rather than the mechanisms through which entrepreneurs integrate AI tools into their business models.

2.5 Identified Research Gap

Although the literature provides valuable insights into digital entrepreneurship, AI adoption, and national digital readiness, a clear gap remains at the intersection of these domains within the Saudi context. Few studies combine AI adoption, entrepreneurship, Saudi Arabia, and global datasets within a single analytical framework. Moreover, most existing research relies on primary data or firm-level surveys, which limits the ability to capture national-level patterns. This study addresses this gap by synthesizing data from GEM, the World Bank, and the OECD to provide an evidence-based understanding of how AI is shaping digital entrepreneurship in Saudi Arabia.

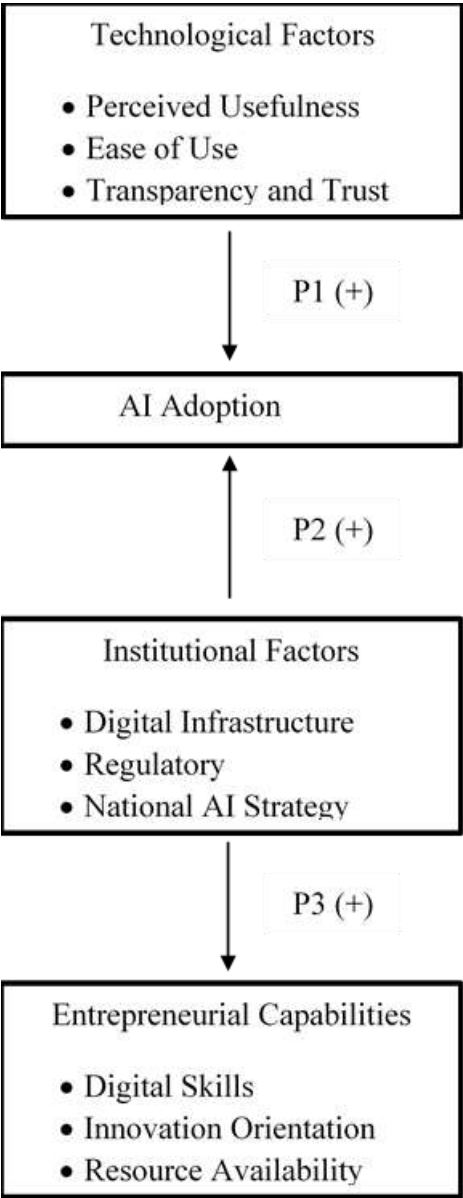
2.6 Critical Gap

Despite the growing body of literature on digital entrepreneurship and AI adoption, existing studies remain fragmented across technological, institutional, and capability-based perspectives. Most Prior research focuses either on firm-level adoption or individual behavioral intentions, often within developed economies (TFSC, 2024). Limited attention has been given to the interaction between national digital readiness and entrepreneurial capabilities in emerging economies such as Saudi Arabia. Furthermore, empirical studies integrating multiple global datasets to examine AI adoption from a macro-analytical perspective remain scarce. This study addresses this gap by offering an integrated,

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secondary-data-based analytical perspective that connects technological readiness, institutional support, and entrepreneurial capabilities.

Figure 1. Conceptual model of AI adoption among Saudi entrepreneurs



Source: Adah A. Alessa, 2026, p.7

3. Theoretical Framework

The theoretical foundation of this study draws on four interconnected perspectives: digital entrepreneurship, artificial intelligence adoption, national digital readiness, and technology acceptance theory. Together, these perspectives provide a comprehensive lens for understanding how entrepreneurs in Saudi Arabia integrate AI tools into their business activities.

3.1 Digital Entrepreneurship as a Transformative Paradigm

Digital entrepreneurship represents a shift from traditional venture creation toward business models that rely on digital platforms, data analytics, and algorithmic decision making. Scholars argue that digital entrepreneurship is characterized by reduced entry barriers, rapid scalability, and the ability to leverage digital ecosystems for value creation (Nambisan et al., 2024). This paradigm is particularly relevant in emerging economies undergoing structural transformation, where digital tools help entrepreneurs overcome institutional and resource constraints. In Saudi Arabia, national strategies emphasizing innovation and digitalization have accelerated the transition toward digitally enabled entrepreneurial activity (SDAIA, 2025).

3.2 Artificial Intelligence as an Enabler of Entrepreneurial Innovation

Artificial intelligence has become a central driver of innovation within entrepreneurial ecosystems. AI tools such as machine learning, natural language processing, and predictive analytics enable entrepreneurs to automate processes, enhance customer engagement, and make data driven decisions. The integration of AI into entrepreneurial activities is associated with improved efficiency, greater opportunity recognition, and enhanced competitive advantage (Scientific Reports, 2025). However, AI adoption is influenced by factors such as technological readiness, perceived risk, trust in AI systems, and the availability of digital skills considerations that are especially salient for entrepreneurs operating under uncertainty and limited resources.

3.3 Technology Acceptance Models (TAM and UTAUT)

Technology acceptance models provide a robust theoretical lens for analyzing how entrepreneurs evaluate and adopt AI technologies. The Technology Acceptance Model (TAM) posits that perceived usefulness and perceived ease of use are primary determinants of technology adoption (Davis, 1989). The Unified Theory of Acceptance and Use of Technology (UTAUT) expands this framework

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by incorporating performance expectancy, effort expectancy, social influence, and facilitating conditions (Venkatesh et al., 2003). In the context of AI, trust, transparency, and perceived risk further shape adoption decisions, particularly because AI systems often operate in ways that are less observable than conventional tools (Venkatesh et al., 2012).

3.4 Integrating the Theoretical Components

By synthesizing insights from digital entrepreneurship, AI adoption research, national digital readiness, and technology acceptance models, this study develops a comprehensive theoretical framework for understanding AI adoption among Saudi entrepreneurs. The framework posits that AI adoption is shaped by three interconnected dimensions:

- Technological factors (e.g., perceived usefulness, ease of use, algorithmic transparency, trust)
- Institutional factors (e.g., digital infrastructure, regulatory support, national AI strategy)
- Entrepreneurial capability factors (e.g., digital skills, innovation orientation, resource availability)

These dimensions collectively influence entrepreneurs' decisions to integrate AI tools into their business models and form the basis for the study's conceptual model.

3.5 Conceptual Model

The conceptual model proposes that technological, institutional, and entrepreneurial capability factors influence AI adoption among entrepreneurs in Saudi Arabia. Technological factors are expected to increase adoption when entrepreneurs view AI as useful, manageable, and reliable. Institutional factors are expected to reduce barriers by providing infrastructure, policy support, and facilitating conditions. Entrepreneurial capability factors are expected to strengthen the ability of entrepreneurs to understand, test, and implement AI tools effectively.

In addition to the three direct relationships, the model incorporates an integrated proposition (P4) that reflects the combined influence of technological readiness, institutional support, and entrepreneurial capabilities. This integrated perspective aligns with interpretive secondary data research, which emphasizes ecosystem level interactions rather than isolated causal effects.

Propositions Development

Building on the conceptual model, the study advances four propositions

that reflect theoretically grounded expectations rather than statistically tested hypotheses. These propositions integrate insights from TAM, UTAUT, digital entrepreneurship theory, and national digital readiness frameworks.

P1: Technological factors positively influence the adoption of artificial intelligence among entrepreneurs in Saudi Arabia.

P2: Institutional and environmental factors positively influence the adoption of artificial intelligence among entrepreneurs in Saudi Arabia.

P3: Entrepreneurial capability factors positively influence the adoption of artificial intelligence among entrepreneurs in Saudi Arabia.

P4: Technological, institutional, and entrepreneurial capability factors jointly explain a significant proportion of the variance in AI adoption among Saudi entrepreneurs.

4. Methodology

This study adopts an interpretive secondary data analytical design to examine the factors shaping AI adoption among entrepreneurs in Saudi Arabia. The methodological approach aligns with established practices in entrepreneurship and digital transformation research, where secondary datasets are used to capture ecosystem level patterns and national digital readiness (OECD, 2024; World Bank, 2025). The aim is not to test causal hypotheses statistically but to synthesize converging evidence from reputable international sources to develop a macro level explanation of AI adoption.

4.1 Research Design

A cross sectional analytical design was employed to capture the current state of AI adoption within the Saudi entrepreneurial ecosystem. This design is appropriate for examining relationships between technological, institutional, and capability related factors at a national level. Interpretive secondary data designs are widely used in digital transformation research because they allow researchers to analyze large scale, internationally comparable indicators without the limitations of small sample primary studies (UNESCO, 2024).

4.2 Data Sources

The analysis draws on three internationally recognized datasets:

- Global Entrepreneurship Monitor (GEM, 2023): Provides indicators related to entrepreneurial activity, digital skills, innovation orientation, and technology use among early stage entrepreneurs.
- World Bank Digital Adoption Index (2022): Offers national level measures of digital readiness, including digital infrastructure, digital public

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services, and business digital adoption.

- OECD AI Readiness Indicators (2023): Assess national AI capabilities, regulatory frameworks, data governance, and institutional support for AI adoption.

These datasets were selected for their methodological rigor, international comparability, and relevance to the constructs examined in this study.

4.2.1 Variables and Operationalization

Based on the conceptual model, four main constructs were operationalized:

4.2.2 Technological Factors

Measured using GEM (2023) indicators related to:

- perceived usefulness
- ease of use
- digital tool adoption
- technology driven innovation

4.2.3 Institutional and Environmental Factors

Captured through national level indicators from the World Bank (2022) and OECD (2023), including:

- digital infrastructure
- regulatory support
- AI governance
- digital public services

4.2.4 Entrepreneurial Capabilities

Assessed using GEM (2023) measures of:

- digital skills
- innovation orientation
- resource availability

4.2.5 AI Adoption

Operationalized using GEM (2023) indicators:

- use of AI tools
- use of data analytics as a proxy for AI enabled decision making

All variables were standardized to ensure comparability across datasets.

4.3 Data Integration and Analytical Approach

Given the multi-source nature of the data, a triangulation approach was used to enhance analytical robustness. Indicators from GEM, the World Bank, and the OECD were conceptually aligned to ensure consistency across constructs. The study adopts a descriptive and interpretive analytical approach, focusing on

pattern identification and cross source consistency rather than statistical hypothesis testing. This approach is appropriate for macro level analyses using aggregated secondary data (TFSC, 2025).

4.5 Analytical Strategy

The analytical strategy centers on identifying converging evidence across datasets. Indicators were examined collectively to identify consistent patterns that provide indicative evidence of relationships among the study variables. This strategy emphasizes interpretive consistency and theoretical alignment rather than statistical inference. The analysis is therefore explanatory rather than predictive, consistent with the interpretive nature of the research design.

4.6 Validity and Reliability Considerations

The use of internationally recognized datasets enhances validity, as these sources employ rigorous sampling methodologies, standardized measurement instruments, and annual data collection cycles. Reliability is strengthened through triangulation, which reduces measurement bias and increases the robustness of the findings. Cross dataset convergence was used as an additional reliability check.

4.7 Ethical Considerations

The study relies exclusively on publicly available secondary data. No personal or identifiable information is used, and all datasets comply with international ethical standards for data collection and reporting. Therefore, institutional review board (IRB) approval was not required.

5. Results

The empirical findings are derived from GEM (2023), the World Bank Digital Adoption Index (2022), and the OECD AI Readiness Indicators (2023). The results are interpreted in alignment with the study’s conceptual model and propositions (P1–P4). The analysis follows a triangulation logic, emphasizing converging evidence across datasets to explain AI adoption among Saudi entrepreneurs.

Table 1. Digital Capability Indicators (GEM, 2023)

Indicator	Saudi Arabia	Global Average
Digital Skills	68%	54%
Use of Digital Tools	72%	58%
Innovation Orientation	41%	29%
Use of Data Analytics	36%	22%
Use of AI Tools	19%	11%

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Source: Global Entrepreneurship Monitor (GEM), Saudi Arabia Report 2023.

The high levels of digital skills (68%) and digital tool usage (72%) indicate strong technological readiness among Saudi entrepreneurs, supporting Proposition P1. As GEM notes, “*Saudi entrepreneurs demonstrate relatively high levels of digital capability compared to global benchmarks.*” Innovation orientation (41%) and the use of data analytics (36%) further reinforce this technologically capable entrepreneurial base.

AI adoption among Saudi entrepreneurs (19%) exceeds the global average (11%), suggesting an emerging yet promising pattern of AI integration. Although adoption remains in its early stages, the upward trend reflects increasing awareness and a growing willingness to experiment with AI-enabled solutions. These findings align with recent global research showing that entrepreneurs adopt AI when digital maturity is sufficiently developed (JBR, 2024; Scientific Reports, 2025).

Table 2. Digital Adoption Index (World Bank, 2022)

Dimension	Saudi Arabia	OECD Average
Digital Infrastructure	0.82	0.78
Digital Public Services	0.87	0.81
Business Digital Adoption	0.76	0.72
Overall Digital Readiness	0.82	0.77

Source: World Bank, Digital Adoption Index (DAI), 2022.

Saudi Arabia’s strong performance in digital infrastructure (0.82) and digital public services (0.87) provides clear evidence of institutional readiness, supporting Proposition P2. These indicators reflect sustained national investments in broadband expansion, cloud infrastructure, and e-government services factors that reduce friction in technology adoption and enhance the feasibility of AI integration.

The World Bank (2025) highlights Saudi Arabia as one of the fastest-advancing digital economies globally, driven by coordinated institutional efforts. This institutional strength is particularly important for entrepreneurs, who

often rely on external support to overcome resource constraints and technological uncertainty.

Table 3. AI Readiness Indicators (OECD, 2023)

Indicator	Saudi Arabia	OECD Average
AI Infrastructure	78/100	74/100
Data Governance	72/100	70/100
AI Regulatory Framework	80/100	76/100
AI Skills & Talent	69/100	71/100
National AI Strategy Implementation	85/100	79/100

Source: OECD, *AI Readiness Assessment Report, 2023*.

Saudi Arabia performs strongly across AI infrastructure, regulatory development, and national AI strategy implementation. These indicators reinforce the institutional dimension of the conceptual model and provide additional support for Proposition P2.

The high score in national AI strategy implementation (85/100) reflects the effectiveness of SDAIA’s initiatives and Vision 2030 programs, which have accelerated AI-related capacity building and governance. OECD (2024) reports that Saudi Arabia is among the leading countries in AI policy readiness, particularly in data governance and regulatory frameworks key enablers of entrepreneurial AI adoption.

Table 4. AI Adoption Indicators Among Entrepreneurs

AI Usage Dimension	Percentage
Customer Engagement	22%
Marketing Automation	18%
Predictive Analytics	14%
Decision Support	11%
Overall AI Adoption	19%

Source: GEM, Saudi Arabia Report 2023.

GEM data show that Saudi entrepreneurs are already using AI in practical business functions, particularly in customer- facing activities. This pattern is consistent with global evidence indicating that entrepreneurs adopt AI first in areas where benefits are immediate and visible (UNESCO, 2024). The adoption

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sequence starting with customer engagement and marketing automation before moving toward predictive analytics and decision support supports Proposition P3, which emphasizes the role of entrepreneurial capabilities (digital skills, innovation orientation, resource availability) in shaping adoption behavior.

5.1 Integrated Results Interpretation and Support for Proposition P4

The convergence of evidence across GEM, World Bank, and OECD datasets demonstrates that AI adoption among Saudi entrepreneurs is shaped by the combined influence of:

- Technological Readiness
- Institutional Support
- Entrepreneurial Capabilities

This integrated pattern provides strong support for Proposition P4, which posits that these three dimensions jointly explain a significant share of variation in AI adoption behavior. Recent global studies similarly highlight that AI adoption in emerging digital economies is driven by ecosystem level interactions rather than isolated factors, which posits that technological, institutional, and capability-based factors jointly shape AI adoption among Saudi entrepreneurs (TFSC, 2025; OECD, 2024).

6. Discussion

The findings of this study show that AI adoption among entrepreneurs in Saudi Arabia is best understood as a multi-level process shaped by technological readiness, institutional support, and entrepreneurial capabilities. The triangulated evidence from GEM (2023), the World Bank (2022), and the OECD (2023) demonstrates that these three dimensions interact to create an enabling environment for AI integration supporting all four propositions (P1-P4).

From a technological perspective, Saudi entrepreneurs exhibit relatively strong digital maturity, reflected in high levels of digital skills, digital tool usage, and innovation orientation. These findings support Proposition P1, which posits that technological factors positively influence AI adoption. This aligns with TAM

and UTAUT, which emphasize perceived usefulness, ease of use, and performance expectancy as key determinants of technology adoption (Davis, 1989; Venkatesh et al., 2003). Recent global studies similarly show that entrepreneurs adopt AI when they possess sufficient digital competence and when AI tools are perceived as reliable and manageable (JBR, 2024; Scientific Reports, 2025).

Institutional readiness emerges as the strongest enabler of AI adoption, supporting Proposition P2. Saudi Arabia's high performance in digital infrastructure, digital public services, and AI governance reflects sustained national investment in digital transformation. OECD (2024) and World Bank (2025) reports highlight Saudi Arabia as one of the most rapidly advancing digital economies, driven by coordinated policy efforts, cloud infrastructure expansion, and AI-focused regulatory development. These institutional conditions reduce uncertainty, lower adoption barriers, and provide entrepreneurs with the external support needed to integrate advanced technologies into their operations.

Entrepreneurial capabilities also play a significant role in shaping AI adoption, supporting Proposition P3. GEM data show that Saudi entrepreneurs possess strong digital skills and a growing innovation orientation capability that enable them to experiment with AI tools and integrate them into business processes. This finding is consistent with recent research emphasizing that digital skills and innovation capacity are critical for leveraging AI in entrepreneurial contexts (UNESCO, 2024; TFSC, 2025).

The pattern of AI adoption observed in Saudi Arabia is function-specific. Entrepreneurs tend to adopt AI first in customer-facing activities such as customer engagement and marketing automation before progressing toward more advanced applications like predictive analytics and decision support. This adoption sequence reflects a pragmatic, value-oriented approach in which entrepreneurs prioritize use cases that offer immediate and visible benefits. Similar patterns have been documented in emerging digital economies, where early AI adoption typically focuses on marketing and customer interaction due to their low complexity and high return on investment (OECD, 2024).

The findings support Proposition P4, which posits that technological, institutional, and capability-based factors jointly explain AI adoption among

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Saudi entrepreneurs. The convergence of evidence across datasets demonstrates that AI adoption is not driven by isolated factors but by the interaction of ecosystem-level enablers and entrepreneur-level capabilities. This integrated effect aligns with contemporary digital transformation research, which emphasizes that successful AI adoption in emerging economies depends on the alignment of infrastructure, policy, skills, and entrepreneurial readiness (World Bank, 2025; SDAIA, 2025).

Saudi Arabia's national transformation agenda particularly the National Strategy for Data and AI appears to be translating into tangible entrepreneurial outcomes. The institutional environment provides strong facilitating conditions, while entrepreneurs themselves demonstrate growing digital competence and openness to AI experimentation. Although adoption remains at an emerging stage, the trajectory is promising and reflects the broader digital evolution of the Saudi economy.

7. Conclusion

This study examined the adoption of artificial intelligence among entrepreneurs in Saudi Arabia using an integrated secondary data analytical approach. By synthesizing evidence from GEM (2023), the World Bank Digital Adoption Index (2022), and the OECD AI Readiness Indicators (2023), the study demonstrates that AI adoption in the Saudi entrepreneurial ecosystem is shaped by the interaction of technological readiness, institutional support, and entrepreneurial capabilities. Saudi entrepreneurs exhibit relatively strong digital maturity, reflected in high levels of digital skills, digital tool usage, and innovation orientation. At the same time, the national environment characterized by advanced digital infrastructure, robust public digital services, and an active national AI strategy provides strong facilitating conditions for AI integration.

The findings reinforce the view that AI adoption in emerging digital economies is not driven by a single factor but by a connected ecosystem of readiness, capability, and institutional support. This aligns with recent global research emphasizing that successful AI adoption depends on the alignment of infrastructure, policy, skills, and entrepreneurial openness to experimentation (OECD, 2024; World Bank, 2025). The Saudi case illustrates how coordinated national strategies, such as the National Strategy for Data and AI, can accelerate

digital transformation and enable entrepreneurs to leverage advanced technologies for growth and competitiveness.

The study also provides strong support for the integrated proposition (P4), showing that technological, institutional, and entrepreneurial capability factors jointly explain AI adoption among Saudi entrepreneurs. This holistic pattern reflects the structure of Saudi Arabia's digital transformation agenda, where infrastructure development, regulatory clarity, and capability building operate together to advance AI diffusion. Although AI adoption remains at an emerging stage, the trajectory is promising and indicates that continued investment in digital skills, institutional coordination, and practical AI enablement will be essential for sustaining momentum.

Future research should build on these findings by incorporating primary data to explore sector specific adoption patterns, perceived risks, and implementation challenges. Longitudinal studies would also provide valuable insights into how AI adoption evolves as Saudi Arabia deepens its digital transformation and expands its innovation ecosystem.

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