





“Exploring the role of artificial intelligence technology in empowering women-led startups”

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EXPLORING THE ROLE OF ARTIFICIAL INTELLIGENCE TECHNOLOGY IN EMPOWERING WOMEN-LED STARTUPS

Abstract

The study aims to investigate how artificial intelligence (AI) influences women-led startups in Saudi Arabia, aiming to understand their unique experiences, challenges, and opportunities within the AI technology landscape. This study used a qualitative method, conducting 16 in-depth interviews with women entrepreneurs operating businesses in Saudi Arabia. The analysis was performed using thematic analysis with NVivo 12, uncovering key themes and insights. The findings reveal that cultural norms, societal expectations, limited awareness, and financial constraints are directly associated with women's involvement in AI-driven businesses. Cultural biases emerged as impediments, underscoring the need for targeted interventions such as awareness campaigns and educational initiatives to dismantle ingrained biases and foster an environment that recognizes and celebrates the contributions of women in the tech and AI sectors. Educational programs, collaborations between academia and industry, and mentorship initiatives were identified as pivotal components to prepare women entrepreneurs to navigate the intricate landscape of AI adoption. Financial inclusion emerged as a critical pillar, advocating for equitable access to funding and resources tailored specifically for women-led AI startups. The study further emphasizes the importance of fostering supportive ecosystems that extend beyond financial aid. Creating networks for mentorship, guidance, and collaboration provides women entrepreneurs with platforms to share experiences and resources, enhancing resilience and the potential for success in the AI landscape.

Keywords

technology, business, artificial intelligence, innovation, entrepreneurship

JEL Classification

O14, M10, M13, M15

INTRODUCTION

Organizations have rapidly realized the potential of utilizing technology to enhance their innovation capabilities and overall performance (Musiolik et al., 2020; Bai & Li, 2020). Within the context of the digital age, artificial intelligence (AI) stands out as a pivotal technology that continuously influences the innovation processes of organizations (Wamba & Mishra, 2017). AI services are increasingly taking the place of human service providers in numerous industries (NISA, 2017). The advent of AI services, in conjunction with advancements in information and communication technology, is leading to a convergence of products and services. AI service applications are varied and widespread. The rapid dissemination of AI services can pose a considerable challenge for startups that adhere to conventional development processes (Musiolik et al., 2020). This is primarily attributable to the dynamic nature of customer demands, influenced by the widespread adoption of AI services. Consequently, startups may find it arduous to accurately discern and cater to evolving customer needs in their quest to innovate and create novel products (Mustak et al., 2021). AI services are characterized by their precision in predictions, relying on extensive pre-big data analysis executed by non-human AI systems (TIPA, 2017).

The integration of AI within Saudi Arabia is emblematic of a multifaceted transformation aimed at diversifying the nation's economy, stimulating innovation, generating employment opportunities, and elevating the quality of services delivered across a spectrum of sectors (Ahmed, 2019; Al-Baity, 2023). In recent years, Saudi Arabia has witnessed significant advancements in its efforts to promote gender diversity and inclusion, with a particular focus on empowering women to engage in various sectors of the economy, including entrepreneurship as part of Saudi Vision 2030. Women-led startups in Saudi Arabia face multifaceted challenges in adopting AI technology due to cultural barriers, limited STEM education access, financial constraints, infrastructural hurdles, and a lack of networking opportunities. Addressing these challenges demands policy reforms, targeted education initiatives, financial support, and the creation of supportive ecosystems promoting gender equality in the tech sector.

1. LITERATURE REVIEW

Numerous startup businesses struggle to endure because they encounter challenges in effectively aligning their product or service with commercial success (Wiklund et al., 2010; Nasar et al., 2019). The causes of startup failures encompass difficulties in adapting to evolving environmental conditions, an absence of technical distinctiveness, a dearth of managerial expertise, and a lack of mechanisms to navigate shifting environmental landscapes (Kwon & Choi, 2015). Particularly noteworthy among the contributing factors to startup setbacks are the shortcomings in embracing cutting-edge product development processes and a limited comprehension of consumer behavior and market dynamics during the initial stages of a startup's journey (Kalyanasundaram, 2018). The meta-analysis study depicts that downfall of startups have revealed that the primary factors contributing to their failure involve a deficient grasp of competitors, consumers, and the surrounding environmental dynamics, an adherence to conventional business practices, and a shortfall in technological advancement (Kirchberger & Pohl, 2016; Dwivedi et al., 2013). Moreover, unsuccessful startups tend to exhibit a passive response to external changes and often lean heavily on internal expertise and technology, highlighting the critical significance of adaptability to environmental shifts based on an accumulated comprehension of consumer needs and the innovative enhancement of established business strategies as indispensable factors for achieving startup success.

Startups, when venturing into the development of new products and services, typically adhere to a well-established process that unfolds systematically (Cooper, 1990). In this context, startups engage

in the conception, production, and delivery of innovative products and services, relying on human-centered processes while concurrently subjecting these offerings to quality assessments aimed at elevating customer satisfaction (Gwag & Lee, 2014). As startups operate within an increasingly globalized landscape, considering ethical implications becomes integral to development strategies. The responsible and ethical use of AI is not only a moral imperative but also a strategic consideration for startups aiming to build trust with customers, investors, and other stakeholders. Development strategies should incorporate guidelines and frameworks for ethical AI use, ensuring that the benefits of AI are realized without compromising principles or societal values. In the dynamic landscape of contemporary business, startups face an ever-evolving set of challenges and opportunities, particularly in the context of the growing influence of AI. The development strategies for startups in the age of AI encapsulates a critical exploration of approaches that startups can leverage to not only survive but thrive in an era where AI is a transformative force (Dwivedi et al., 2021; Baek et al., 2023). The rapid integration of AI technologies into various facets of business operations has necessitated a strategic reevaluation for startups. In this age of AI, where data-driven decision-making and automation are becoming the norm, startups must carve out strategies that align with the capabilities and potential disruptions posed by these advanced technologies (Toniolo et al., 2020). One key aspect of navigating the age of AI for startups is the emphasis on data-driven decision-making. AI thrives on data, and startups that strategically collect, analyze, and leverage data stand to gain a competitive edge. Development strategies need to prioritize the establishment of robust data infrastructure and analytical capabilities, enabling startups to derive

valuable insights that inform their decision-making processes (Cao, 2022). Furthermore, the integration of AI technologies itself becomes a strategic imperative. Startups can explore adopting AI for various purposes, including process automation, personalized customer experiences, and predictive analytics. Incorporating AI tools not only boosts operational efficiency but also creates opportunities for innovation, enabling startups to offer products and services that are at the forefront of technological advancement.

Startups can benefit from partnerships with established AI companies or academic institutions, fostering an ecosystem where knowledge exchange and resource-sharing become catalysts for growth (Feuerriegel et al., 2020). Collaborative initiatives can also provide startups with access to cutting-edge AI research and talent, mitigating the resource constraints that often challenge emerging businesses. However, startups are now navigating the era of AI-driven revolutionary innovation in contrast to their earlier reliance on human-centric or Internet-based services (Oppong et al., 2020). In the pursuit of sustainable growth, startups must prioritize adaptability. The pace of AI innovation is relentless, and development strategies need to be agile enough to accommodate rapid technological advancements. This involves cultivating a culture of continuous learning and experimentation within the startup, ensuring that the team remains abreast of the latest AI developments and can swiftly integrate relevant technologies into their operations. The synergy of AI technologies, coupled with big data, virtual reality, and the internet of things (IoTs), is giving rise to pioneering convergence services built on data acquisition and AI-driven analysis, continually shaping novel service markets (Asch et al., 2018; Bibri & Jagatheesaperumal, 2023). With the expectation of fierce competition for market leadership in this rapidly evolving landscape, startups are compelled to accelerate the development of AI services and concurrently devise innovative methods for assessing product quality to discern and cater to customer needs, thus enhancing overall customer satisfaction. Thus, it is important to understand dynamics for AI services to empower startups by reinforcing the positive development cycle, facilitating a more precise understanding of customer demands and streamlining development.

The entrepreneurial landscape in Saudi Arabia is currently experiencing a significant transformation with a notable increase in the number of women establishing their startups (GEM, 2021; Abdelwahed et al., 2022). This shift is a reflection of broader societal changes and economic reforms underway in the Kingdom, aimed at fostering a more inclusive and diverse business environment. First and foremost, the economic reforms and women empowerment initiatives, such as Saudi Arabia's Vision 2030, have placed a strong emphasis on encouraging women's participation in the workforce and entrepreneurship. Challenges encompass obstacles in accessing funding, navigating cultural expectations, and breaking into traditionally male-dominated industries (Al-Abdallah, 2019; Alhothali & Al-Dajani, 2022; Machado et al., 2023). Nevertheless, significant opportunities arise from a burgeoning consumer market, substantial government support, and the potential for innovation and technological advancement. In line with global trends, women-led startups in Saudi Arabia are exploring opportunities in technology and innovation, venturing into sectors like e-commerce, technology-driven services, and healthcare (Alessa et al., 2021; Al-Baity, 2023). Networking opportunities, mentorship programs, and robust support from government agencies and organizations dedicated to fostering entrepreneurship have been instrumental in the growth and success of women-led startups in Saudi Arabia (Al-Abdallah, 2019; Abdelwahed et al., 2022). Beyond economic contributions, the emergence of women-led startups is also challenging traditional gender roles and perceptions, contributing to gender empowerment and societal change (Dean et al., 2019; Alateeg & Alhammadi, 2024a). As the entrepreneurial ecosystem continues to evolve, women-led startups in Saudi Arabia are increasingly looking to collaborate with international partners and tap into global markets, fostering a spirit of international entrepreneurship (Al-Dajani & Alsahli, 2021; Alateeg & Alhammadi, 2023). The literature on this subject reflects the dynamic and ever-evolving landscape of entrepreneurship in Saudi Arabia, where women are playing an increasingly prominent role and making significant contributions to the economy and society. Nevertheless, women entrepreneurs often grapple with the challenge of balancing the demands of work and family, particularly in a cultural context where family holds a central role.

Emerging fields such as AI and digitalization are increasingly of interest to these entrepreneurs.

Currently, there remains a limited body of research dedicated to the empowerment of women-led startups and eco-entrepreneurship (Potluri & Phani, 2020). Nevertheless, existing research underscores the persistence of gender-based perceptions of entrepreneurship, both in practical application and theoretical constructs (Ahl & Marlow, 2012). Consequently, this study primarily centers its attention on women-led startups that incorporate AI services.

The study aims to investigate how AI influences women-led startups in Saudi Arabia, aiming to understand their unique experiences, challenges, and opportunities within the AI technology landscape.

2. METHODOLOGY

In-depth interviews were conducted with female entrepreneurs who started their businesses in 2022 or earlier in the qualitative study, ensuring that their enterprises were established before the onset of AI integration in Saudi Arabia. To select study

participants, a purposive sampling technique was used. A total of sixteen interviews were conducted with owners of micro, small, medium, and large-scale enterprises from October to November 2023. These individual interviews took place in private locations to ensure the utmost privacy and confidentiality. Each interview commenced with a concise researcher introduction and an overview of the study's aims. It comprised three key segments: an introduction, a consent form, and open-ended questions. The participants willingly joined the study, giving their consent, and all interviews were recorded with their permission. To safeguard confidentiality, a unique code was assigned to each interview. For monitoring categories and themes, a review and analysis of written notes and transcripts were conducted using the thematic analysis technique, assisted by NVivo software version 12. Thematic analysis, a well-established method in qualitative research, involves systematically examining textual content to identify relevant themes, extending to the analysis of body language, audio, and visual data, and there are several steps: familiarizing with data through transcript readings, categorizing and coding, themes and ultimately theorizing AI's importance for women-led startups in Saudi Arabia.

Table 1. Characteristics of study participants

Code	Age	Education	Marital Status	Overall work experience	Size of company	Number of employees	Expand family-owned enterprise	Field of work
PT-1	24	Bachelor	Married	02 years	Micro	03	No	Online store (e-commerce)
PT-2	28	Bachelor	Married	03 years	Small	15	No	Digital marketing
PT-3	28	Bachelor	Single	05 years	Medium	20	No	Tech startup
PT-4	42	Bachelor	Married	15 years	Large	140	No	Tech startup
PT-5	32	Bachelor	Married	08 years	Medium	50	Yes	Managing human resources
PT-6	36	Bachelor	Married	05 years	Micro	01	Yes	Online store (ecommerce)
PT-7	30	Master	Single	05 years	Small	06	No	Healthcare
PT-8	50	PhD	Married	20 years	Medium	30	No	Translation and writing
PT-9	38	Master	Married	06 years	Small	07	No	Digital marketing
PT-10	26	Bachelor	Single	03 years	Small	08	No	Healthcare
PT-11	36	Bachelor	Married	14 years	Medium	40	No	Tech startup
PT-12	41	Bachelor	Married	15 years	Small	05	No	Fashion and design
PT-13	33	Bachelor	Married	08 years	Medium	39	No	Financial and banking
PT-14	38	Master	Married	09 years	Small	11	No	Healthcare
PT-15	37	Master	Married	11 years	Medium	90	No	Data analytics
PT-16	39	Master	Married	15 years	Large	120	No	Education

Interview questions were specific to gender-related factors in shaping women entrepreneurs' involvement in AI-driven businesses as mentioned in the Appendix A. The standard interview duration was approximately 35 minutes on average. After the interviews were completed, the researcher meticulously recorded interview notes and then transcribed them. Prior to initiating the transcription process, a summary or overview was prepared.

The demographic profile of the study participants is mentioned in Table 1. To provide further detail, verbatims from participants are indicated using codes such as PT1, PT2, PT3 for women entrepreneur -1, -2, -3, respectively.

3. RESULTS

The data analysis provided valuable insights and concepts from female entrepreneurs regarding the sustainability and expansion of their businesses. A notable finding of this study is the pronounced requirement for governmental and institutional backing to enable women entrepreneurs in sustaining and advancing enterprises through the utilization of AI. Table 2 highlights the theme and its categories, with corresponding sub-categories, providing a clear organization for the different aspects of women entrepreneurs and AI adoption in Saudi Arabia.

The analysis revealed the experiences, challenges and opportunities among women entrepreneurs in Saudi Arabia. It delves into the societal influ-

ences, challenges in AI awareness and adoption, and the perceived value and motivations driving women entrepreneurs' engagement with AI technologies.

AI technology has significantly enhanced the professional experiences of women by offering flexible work arrangements, allowing them to balance careers with personal responsibilities. Personalized learning platforms driven by AI have empowered women to acquire new skills and advance in their careers. In entrepreneurship, AI tools have simplified business processes, making tasks like marketing, customer management, and financial planning more efficient. This has enabled women entrepreneurs to focus more on innovation and growth. Overall, AI is playing a crucial role in supporting women's success in various fields. Cultural norms are instrumental in influencing the decision-making of women entrepreneurs. Overcoming deeply ingrained stereotypes and biases is crucial for creating an environment where women feel empowered to take on leadership roles in AI-driven businesses. Most importantly, societal expectations can act as both motivators and barriers. While expectations may drive women to excel, they can also impose limitations. Balancing these expectations requires fostering an environment that encourages women to challenge traditional norms without fear of societal backlash. Moreover, support networks offer a lifeline for women entrepreneurs navigating the challenging landscape of AI business. Establishing and strengthening these networks not only provide valuable guidance but

Table 2. Theme, categories, and codes

Theme	Categories	Sub-categories	Codes
Women Entrepreneurs and AI adoption in Saudi Arabia	Gender dynamics and societal influences	Cultural norms Societal expectations Support networks Access to resources	Cultural norms significantly impact decision-making Societal expectations shape choices in AI entrepreneurship Support networks influence decision-making processes Limited access to funding hampers AI integration
	AI awareness	Awareness levels Understanding of AI	Limited awareness hampers technology adoption Variability in understanding AI among women entrepreneurs
	Adoption challenges	Barriers to AI acceptance Technical challenges Job displacement issues	Cultural barriers affect AI acceptance Technical challenges hinder smooth implementation Concerns about job displacement are prominent
	AI applications and tools	Access Utilization	Make easy access to tools and application for the benefit of business Availability ensure the utilization of tools and applications
	Perceived value and motivations	Perceived benefits of AI Motivations for AI adoption Valuable AI applications	Positive attitudes towards AI adoption Perceived benefits include efficiency and competitiveness Motivations include staying ahead in the market Automation tools streamline business processes Data analytics enhances decision-making

also create a sense of community, promoting collaboration and knowledge-sharing among women in the AI sector. Hence, limited access to funding perpetuates gender disparities in entrepreneurship. Addressing this issue involves creating initiatives that specifically target financial support for women-led AI startups, ensuring that lack of resources does not hinder the potential success of innovative ventures.

The challenge of limited awareness underscores the urgent need for comprehensive educational campaigns. Bridging this gap requires not only disseminating information about AI but also showcasing real-world examples of successful women entrepreneurs who have embraced AI technologies in their businesses. Addressing cultural barriers involves not just breaking down stereotypes but actively promoting the societal benefits of AI. The technical challenges highlight the importance of user-friendly AI solutions. Collaboration between tech developers and women entrepreneurs is key to designing intuitive and adaptable AI tools that align with the unique needs and capacities of women-led startups.

AI applications and tools have become integral components of modern business strategies, offering innovative solutions to enhance efficiency, decision-making, and overall performance. From streamlining operations to improving customer experiences, AI technologies are reshaping how businesses operate across various industries. Thus, integrating AI applications and tools into business strategies can result in heightened efficiency, enhanced decision-making capabilities, and a competitive edge within today's rapidly evolving, technology-centric market landscape. Varied levels of understanding point to the necessity of tailored educational programs that cater to different knowledge levels. Initiatives focused on demystifying AI concepts in accessible ways can empower women entrepreneurs to make informed decisions about integrating AI into their ventures. Initiatives should focus on showcasing how AI can contribute to economic growth, job creation, and societal advancement, dispelling fears and misconceptions. Nonetheless, acknowledging concerns about job displacement necessitates a proactive approach. Reskilling programs, job transition support, and dialogue about the evolving nature of work are essential to address these concerns

and ensure that the workforce is prepared for the AI-driven future. Positive attitudes are closely tied to the tangible benefits women entrepreneurs perceive in adopting AI. Communicating these benefits effectively involves highlighting case studies, success stories, and tangible outcomes to showcase how AI positively impacts efficiency, profitability, and market competitiveness. The motivation to stay ahead in the market is a powerful driver for AI adoption. Creating an ecosystem that encourages innovation involves not only providing financial incentives but also fostering a culture that celebrates and rewards entrepreneurial risk-taking and forward-thinking. Most importantly, recognizing specific AI applications as valuable indicates areas where technology can provide significant advantages. Tailoring AI solutions to address these needs involves collaboration between technology providers and women entrepreneurs to ensure that the applications are practical, user-friendly, and aligned with business objectives.

4. DISCUSSION

This research highlights the imperative of incorporating AI in women-led startups in Saudi Arabia and prospects encountered by women entrepreneurs within the realm of AI technology. It aims to unravel the multifaceted factors shaping the trajectory of women in this sector, contributing valuable insights to foster a more inclusive and informed approach to AI-driven entrepreneurship in the Saudi Arabian context. Cultural norms exert a profound influence on women entrepreneurs, affecting their decision-making processes and choices in the AI sector. Overcoming deeply ingrained biases and stereotypes becomes a focal point for fostering inclusivity. Societal expectations, acting as both motivators and constraints, necessitate a delicate balance. Establishing and reinforcing robust support networks emerges as a strategic imperative, providing mentorship and resources to navigate the unique challenges posed by societal norms (Al-Dajani & Alsahli, 2021; Nasar et al., 2022).

The challenge of limited awareness among female entrepreneurs underscores the imperative for comprehensive educational initiatives. Tailoring programs to varying knowledge levels and demystifying AI concepts are essential components. Addressing cul-

tural barriers and overcoming technical challenges require collaborative efforts between educational institutions, technology developers, and women entrepreneurs (Haefner et al., 2021; Al-Baity, 2023). Recognizing the multifaceted nature of barriers to acceptance, including concerns about job displacement, underscores the need for holistic solutions. Positive attitudes towards AI adoption are intimately connected to perceived benefits and motivations. Effective communication of these benefits involves showcasing practical applications, success stories, and tangible outcomes. Motivations, such as the desire to stay ahead in the market, call for the creation of an ecosystem that not only supports innovation financially but also fosters a culture that values and rewards entrepreneurial endeavors (Nasar & Akram, 2022). Identifying specific AI applications deemed valuable by women entrepreneurs highlights areas where technology can make a tangible impact on business operations.

The synthesis of these thematic findings underscores the need for comprehensive interventions that transcend technical barriers. Educational programs tailored to diverse knowledge levels should be complemented by the establishment and strengthening of support networks (Alateeg et al., 2024). Initiatives must go beyond addressing financial barriers to include mechanisms that challenge cultural norms and provide equitable access to resources. Recognizing and valuing specific AI applications that enhance business operations can drive meaningful technology adoption among women entrepreneurs. Access to AI applications and tools is identified as a critical factor (Alateeg & Alhammadi, 2024b). Ensuring easy access and availability of these tools is imperative for the successful integration of AI into business operations. Additionally, utilization is emphasized, highlighting the need for practical implementation to derive maximum benefits.

The integration of AI into women-led businesses in Saudi Arabia represents a transformative journey, offering a spectrum of opportunities and challenges. AI has the potential to empower women entrepreneurs by providing access to innovative tools and technologies, enhancing operational efficiency, and strategically allocating resources. Moreover, the adoption of AI can challenge traditional gender norms, contributing to societal shifts and altering perceptions of women's capabilities in the business

and technology sectors. However, challenges such as tech education gaps need to be addressed to ensure that women entrepreneurs can fully leverage AI's benefits. Additionally, AI adoption can stimulate economic inclusion by creating job opportunities in AI-related fields, contributing not only to individual business growth but also to the broader economic landscape. As women-led businesses embrace AI technologies, they position themselves as innovators, enhancing their competitiveness in the market and showcasing the potential for strategic decision-making through data-driven approaches. Furthermore, the integration of AI can foster networking and support within tech communities, enabling collaboration and knowledge-sharing among women entrepreneurs. Ethical considerations, including addressing algorithmic bias, become essential for maintaining trust and ensuring fair practices in the evolving landscape of AI-driven entrepreneurship.

Considering the implication, there is a need to develop targeted educational programs that enhance AI awareness and understanding among women entrepreneurs, emphasizing practical applications and success stories. Collaborate with educational institutions and industry experts to design curricula that align with the needs of women-led startups. Furthermore, the creation and strengthening of support networks and mentorship programs, facilitating the exchange of knowledge and resources (Desouza et al., 2020; Abdelwahed et al., 2022). Encourage collaboration between experienced women entrepreneurs and those aspiring to enter the AI sector. Financial inclusion is compulsory for developing financial mechanisms specifically designed to support women-led AI startups. This involves creating accessible funding channels, providing grants, and promoting partnerships with financial institutions to ensure equitable access to resources. Nonetheless, cultural shift plays vital role to engage in widespread societal campaigns that challenge and reshape cultural norms. Collaborate with media, influencers, and community leaders to promote narratives that empower women in AI entrepreneurship, shifting perceptions and fostering an environment that encourages diversity. Hence, actively encourage collaboration between technology developers and women entrepreneurs. Create platforms for dialogue, partnerships, and co-creation to design user-friendly AI solutions that align with the unique needs and capacities of women-led startups.

CONCLUSION

The study aims to investigate how AI influences women-led startups in Saudi Arabia, aiming to understand their unique experiences, challenges, and opportunities within the AI technology landscape. This study found supporting evidence related to AI impact on women-led startup in Saudi Arabia. Hence, empowering women entrepreneurs in Saudi Arabia to embrace AI requires a comprehensive strategy addressing cultural, educational, and financial barriers while nurturing supportive ecosystems. Culturally, challenging traditional norms and societal expectations is essential. Awareness campaigns and educational initiatives can actively dismantle biases, fostering an environment that recognizes and celebrates women's roles in the tech and AI sectors. Education plays a pivotal role, necessitating tailored programs, collaborations between academia and industry experts, and mentorship initiatives. These measures not only enhance technical competencies but also instill a mindset of continuous learning and adaptability crucial for navigating the complexities of AI adoption. Financial inclusion stands as a key pillar, demanding equitable access to funding and resources designed for women-led AI startups. Collaborations between financial institutions, government bodies, and private enterprises can establish mechanisms ensuring that resource constraints do not hinder the transformative potential of women-led ventures. Supportive ecosystems, extending beyond financial aid, involve creating networks for mentorship, guidance, and collaboration. Consequently, future research endeavors could provide valuable support by delving into a mixed-gender approach and employing statistical measurements to quantify the factors identified in this study.

AUTHOR CONTRIBUTIONS

Conceptualization: Sultan Alateeg.
 Data curation: Sultan Alateeg.
 Formal analysis: Sultan Alateeg.
 Funding acquisition: Sura Al-Ayed.
 Investigation: Sura Al-Ayed.
 Methodology: Sura Al-Ayed.
 Project administration: Sultan Alateeg.
 Resources: Sura Al-Ayed.
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 Visualization: Sultan Alateeg.
 Writing – original draft: Sura Al-Ayed.
 Writing – review & editing: Sultan Alateeg.

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APPENDIX A

No.	Interview questions
1	"How aware and knowledgeable are women business owners in Saudi Arabia about AI technology and its applications in business?"
2	"What do you think to sustain and scale-up your business with AI tools?"
3	"What are the supportive and non-supportive factors in your AI business development?"
4	"What is your background and experience in the field of entrepreneurship and AI technology?"
5	"Can you provide insights into the role of gender-related factors in influencing women entrepreneurs' engagement with AI-driven businesses?"
6	"From your perspective, how do societal and cultural factors impact the involvement of women entrepreneurs in AI-related ventures?"
7	"What sources of information and education do you think are most influential in shaping their understanding of AI technology?"
8	"Have you personally encountered any challenges or obstacles related to AI adoption in your business or within your network?"
9	"Can you share examples of AI technologies that have been successfully implemented by women entrepreneurs in the region?"
10	"How do you think these attitudes and motivations can be harnessed to promote AI-driven entrepreneurship among women in Saudi Arabia?"