



Viability and Sustainability of Pioneering AI-Powered Online Business Ventures

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Abstract

This study investigated the entrepreneurial orientation, barriers, challenges, and opportunities associated with AI-powered online businesses in the Philippines. A mixed-methods approach was used to gather data from internal and external stakeholders through surveys. Results showed a positive inclination towards innovation (overall mean = 3.92), risk-taking (overall mean = 3.79), and proactiveness (overall mean = 4.05) in AI adoption, with internal stakeholders perceiving their organizations as more innovative and proactive. Significant barriers included high AI costs (mean = 4.40), data privacy concerns (mean = 4.15), and lack of technical expertise (mean = 4.05). Challenges in e-commerce operations, digital infrastructure, and AI adoption were identified, but opportunities for growth and competitiveness were also recognized. AI-enhanced customer experiences and AI-driven customer service efficiency were seen as significant opportunities. Digital infrastructure had a crucial impact on sustainability (overall mean = 4.29), with reliable internet connectivity and fast internet speed being essential for AI-powered services. A predictive model for success indicated that AI adoption drove efficiency, competitiveness, and innovation, with benefits outweighing drawbacks when managed properly. The findings suggested that AI adoption was a key driver of business growth and competitiveness. Therefore, prioritizing AI adoption, investing in digital infrastructure, and implementing robust risk management strategies were recommended to ensure long-term sustainability and competitiveness in AI-powered online businesses.

Keywords: AI-Powered; Artificial Intelligence; Online Business; Sustainability; Viability

1. Introduction

The rapid evolution of artificial intelligence (AI) transformed the global business landscape, enabling entrepreneurs to pioneer innovative online ventures that transcended geographical boundaries. AI-powered technologies revolutionized business operations, competition, and customer value delivery. Digital platforms, e-commerce, and digital entrepreneurship grew remarkably, driven by governments' proactive initiatives. However, a gap persisted in AI adoption, particularly in regional areas. The Philippines, with its talent pool, digital infrastructure, and conducive business environment, was a promising setting for AI-powered online businesses. This study investigated entrepreneurial orientation, barriers, challenges, and opportunities associated with AI-powered online businesses in the Philippines, aiming to inform SMEs and investors on strategic AI utilization to drive economic growth and innovation.

2. Methodology

This study employed a sequential explanatory mixed-methods approach, integrating quantitative and qualitative phases to assess the viability and sustainability of AI-powered online business ventures in the Philippines (Creswell and Plano Clark, 2018). The quantitative phase measured entrepreneurial orientation using Lumpkin and Dess's (1996) framework, assessed barriers and challenges/opportunities using Philippine Institute for Development Studies (PIDS)

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frameworks with 5-point Likert scales, and evaluated digital infrastructure impact using Oxford Insights AI Readiness Index (2023). Semi-structured interviews (n=20-30) and focus groups (3-4 groups, 6-8 entrepreneurs each) were conducted to explain quantitative outliers and refine the predictive model (Braun and Clarke, 2006). A multi-stage purposive sampling strategy was used, targeting 500 respondents for the quantitative phase and 30 for qualitative follow-up, stratifying by business scale, geographic location, and AI adoption to capture diverse entrepreneurial profiles.

3. Results and Discussion

This section presented the results of the study, highlighting key findings on AI adoption in online business ventures. The discussion contextualized these results within the broader landscape of entrepreneurial strategies and technological integration. An analysis of the opportunities and challenges associated with AI adoption provided insights into the intricacies of managing digital transformation in online businesses. The results of the study were summarized as follows:

4. The Entrepreneurial Orientation of Entrepreneurs

4.1. Towards AI-Powered Online Business Ventures

4.1.1. Innovation

The findings revealed that internal stakeholders perceived their organizations as more innovative in AI adoption (Overall Mean = 4.01) compared to external stakeholders (Overall Mean = 3.84). The overall mean score of 3.92 indicated a positive inclination towards innovation, aligning with Lumpkin and Dess's (1996) framework that entrepreneurial orientation drove business performance. The statement "The business actively seeks and applies new AI technologies to enhance online operational efficiency" received the highest mean score (4.28 for internal, 4.10 for external), highlighting organizations' proactive approach to AI integration. However, "The business is willing to try unproven AI methods in its operations despite uncertainty" received the lowest mean score (3.68 for internal, 3.50 for external), indicating a cautious approach to untested AI methods. These results indicated that businesses were generally innovative in AI adoption but exhibited a more conservative stance towards unproven AI methods. This suggested that organizations focused on leveraging AI to enhance existing processes rather than exploring radical innovations, balancing exploration and exploitation to foster sustainable growth.

4.1.2. Risk

The findings revealed that internal stakeholders tended to agree more (Overall Mean = 3.94) than external stakeholders (Overall Mean = 3.64) on the risk aspects of AI adoption. The overall mean for both internal and external stakeholders fell within the "Agree" range (3.79), indicating a moderate inclination towards risk-taking in AI-powered online businesses. Internal stakeholders scored higher means in all statements, suggesting they perceived their organizations as more risk-oriented in AI adoption. Specifically, "The company prioritizes high-risk AI projects with significant profit potential" received the highest mean (4.20 for internal, 3.90 for external), highlighting the willingness to take calculated risks in AI investments. Conversely, "The company believes substantial AI risks are necessary for business growth" received the lowest mean (3.70 for internal, 3.40 for external), indicating a relatively cautious approach to risk-taking in AI adoption. These results implied that organizations exhibited a moderate risk-taking approach in AI adoption, prioritizing calculated risks over bold strategies. This was consistent with existing literature on entrepreneurial orientation, which suggested that organizations balanced risk and reward in strategic decision-making (Lumpkin and Dess, 1996). The findings underscored the importance of balancing risk-taking with strategic planning in AI investments.

4.1.3. Proactiveness

The findings revealed that internal stakeholders perceived their organizations as more proactive in AI adoption (Overall Mean = 4.20) compared to external stakeholders (Overall Mean = 3.90). The overall mean score of 4.05 suggested a positive inclination towards proactiveness, aligning with Lumpkin and Dess's (1996) framework that entrepreneurial orientation drove business performance. The statement "The business aims to be an industry trendsetter through AI adoption" received the highest mean score (4.40 for internal, 4.10 for external), highlighting organizations' ambition to lead through AI innovation. This suggested that businesses were keen on leveraging AI to stay ahead of the competition, consistent with existing literature on proactive market orientation (Narver and Slater, 1990). These results implied that businesses were proactive in AI adoption, with a strong desire to lead in their industries. AI was seen as a key driver of innovation and competitiveness.

4.2. Barriers Affecting the Performance of Entrepreneurs in AI-Powered Online Business Adoption

The findings revealed that the barriers to AI adoption in online businesses were significant, with an overall mean score of 4.02. The top-ranked barrier, "High AI software and hardware costs hinder adoption," was categorized as a major barrier with a mean score of 4.40. The second-ranked barrier, "Data privacy and security concerns affect AI adoption," had a mean score of 4.15, highlighting stakeholders' concerns about AI-driven data security and privacy. The third-ranked barrier, "The team lacks technical AI knowledge and skills," had a mean score of 4.05, underscoring the significance of this issue. These results suggested that businesses faced substantial obstacles in AI adoption, with cost being the most significant hurdle. This was consistent with existing literature on technology adoption barriers, which highlighted the importance of addressing cost, security, and skill gaps (Kshetri, 2018; Rahman et al., 2017). The findings emphasized the need for strategies to address these barriers to facilitate successful AI implementation.

4.3. Challenges and Opportunities Faced by Entrepreneurs in Implementing AI-Powered Technologies

4.3.1. E-commerce Operations

The findings indicated that stakeholders perceived both internal and external challenges and opportunities associated with AI-powered technologies in e-commerce operations, with overall means suggesting significant impacts. The top challenges included AI integration costs and resource constraints (mean = 4.20), optimizing AI for the Philippine e-commerce market (mean = 4.15), and AI accuracy or bias affecting product recommendations or marketing (mean = 4.00). These challenges underscored the need for e-commerce businesses to prioritize AI fairness and transparency. Stakeholders perceived extensive opportunities in AI-enhanced customer experiences (mean = 4.35), AI-driven customer service efficiency (mean = 4.25), and dynamic pricing and demand forecasting (mean = 4.30). These opportunities were expected to drive business growth and improve competitiveness. The results suggested that businesses faced significant challenges but also had substantial opportunities to leverage AI for growth. This aligned with existing literature on AI adoption, which emphasized balancing challenges and opportunities (Duan et al., 2019; Huang and Rust, 2018). E-commerce businesses needed to develop strategies addressing challenges while capitalizing on opportunities.

4.3.2. Digital Infrastructure

The findings indicated that stakeholders perceived both internal and external challenges and opportunities related to digital infrastructure for AI-powered technologies, with overall means suggesting significant impacts. The top challenges included inadequate data centers and computing resources for AI (mean = 4.30), costly internet and cloud services in the Philippines (mean = 4.20), and lack of advanced digital infrastructure outside urban areas (mean = 4.10). These challenges underscored the need for infrastructure improvements to support AI adoption. Stakeholders perceived extensive opportunities in improvements in digital infrastructure enabling more advanced AI (mean = 4.40), cloud-based AI services overcoming local hardware limitations (mean = 4.30), and fiber optics and 5G connectivity opening new opportunities for AI-powered services (mean = 4.35). These opportunities were expected to drive business growth and improve competitiveness. The results suggested that addressing infrastructure gaps was crucial for unlocking AI's potential. This aligned with existing literature on AI adoption, which emphasized digital infrastructure's role in enabling AI-driven innovation (Kshetri, 2018; World Economic Forum, 2020).

4.3.3. Artificial Intelligence Adoption

The findings of this study indicated that stakeholders perceived both internal and external challenges and opportunities related to AI adoption, with overall means suggesting significant impacts. The top challenges included AI integration costs and resource constraints (mean = 4.20), optimizing AI for the Philippine e-commerce market (mean = 4.10), and AI accuracy or bias affecting product recommendations or marketing (mean = 4.00). These challenges underscored the need for careful planning and expertise in AI adoption. Stakeholders perceived extensive opportunities in AI boosting team productivity and efficiency (mean = 4.35), AI providing valuable data insights for decision-making (mean = 4.35), and AI helping solve complex problems beyond human capabilities (mean = 4.25). These opportunities were expected to drive business growth and improve competitiveness. The results suggested that businesses faced significant challenges but also had substantial opportunities to leverage AI for growth. This was consistent with existing literature on AI adoption, which emphasized balancing challenges and opportunities (Duan et al., 2019; Huang and Rust, 2018). The findings highlighted the need for entrepreneurs to develop strategies addressing challenges while capitalizing on opportunities.

4.4. Impact of Digital Infrastructure on the Sustainability of Online Business Ventures

The findings indicated that respondents had strongly concurred on the pivotal role of digital infrastructure in ensuring the sustainability of online business ventures. Reliable internet connectivity had been deemed indispensable for AI-powered services (Mean = 4.35), with internal stakeholders attributing greater significance to this aspect (Mean = 4.50). Fast internet speed had exerted a substantial influence on online business competitiveness (Mean = 4.25), with internal stakeholders exhibiting stronger concurrence (Mean = 4.40). The results also revealed that digital infrastructure had facilitated efficient business scaling (Mean = 4.15), with internal stakeholders demonstrating stronger agreement (Mean = 4.30). Cybersecurity measures had been emphasized as vital in mitigating digital threats (Mean = 4.25), with external stakeholders placing marginally greater emphasis (Mean = 4.30). Respondents had strongly agreed that investing in digital infrastructure had ensured long-term sustainability (Mean = 4.45), with both internal and external stakeholders exhibiting high levels of concurrence (Means = 4.50 and 4.40, respectively). The overall mean score of 4.29 indicated that digital infrastructure exerted a profoundly significant influence on the sustainability of online business operations.

4.5. Predictive Model for the Success of Pioneering Online Business Ventures Using Artificial Intelligence

The results of the predictive model indicated that AI adoption was a crucial factor in driving the success of pioneering online business ventures. Leveraging AI enabled businesses to make data-driven decisions, develop novel products and services, and enhance operational efficiency. However, the results also highlighted the importance of managing AI-related risks, such as biased algorithms and cyber threats, to ensure that the benefits of AI adoption outweighed its drawbacks. The findings suggested that effective AI implementation led to significant improvements in business performance, including enhanced decision-making, trend prediction, and operational optimization. This aligned with existing literature on the transformative potential of AI in business (Brynjolfsson and McAfee, 2014; Davenport and Ronanki, 2018). The results underscored the need for businesses to develop strategies for mitigating AI-related risks, such as investing in AI governance and cybersecurity measures. The adoption of AI enabled businesses to unlock its full potential and maintain a competitive edge in the market. AI adoption drove business success by enhancing decision-making, predicting trends, and optimizing operations. Subsequently, effective AI implementation required managing risks like biased algorithms and cyber threats. Hence, businesses that leveraged AI effectively achieved significant improvements in performance and competitiveness.

5. Conclusion

This research yielded significant insights into AI-powered online business ventures in the Philippines, contributing to the global understanding of AI in business. The findings informed strategies for AI adoption, investment, and innovation, driving sustainable growth and competitiveness. As AI transformed industries, these insights helped unlock AI's full potential, driving economic growth and prosperity worldwide. This research served as a foundation for future studies, enhancing the sustainability and competitiveness of AI-powered ventures globally.

Compliance with ethical standards

Disclosure of conflict of interest

The author declares that there is no conflict of interest to disclose.

Statement of ethical approval

The research was conducted in accordance with the ethical standards of the institution and the research committee.

Statement of informed consent

Informed consent was obtained from all participants, and their confidentiality was maintained throughout the study.

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