

Digital Entrepreneurship Models Supporting Emerging Innovation Ecosystems

Sultan N. S. Al-Shami

Professor, Universiti Utara Malaysia, Malaysia

Abstract

The rapid expansion of digital technologies has transformed entrepreneurial activities by enabling new business models, innovative value creation approaches, and technology-driven ecosystems. Digital entrepreneurship has emerged as a significant contributor to economic development by supporting startups, technology-based ventures, and collaborative innovation networks. This conceptual research article examines digital entrepreneurship models that support emerging innovation ecosystems by analysing the relationship between digital platforms, entrepreneurial capabilities, technological resources, and collaborative networks. The study explores how digital entrepreneurship enables entrepreneurs to create scalable solutions, access global markets, and develop innovative products and services through advanced technologies.

A conceptual research methodology is adopted based on the analysis of existing scholarly literature, entrepreneurship frameworks, digital innovation models, and ecosystem development approaches. The findings indicate that successful digital entrepreneurship depends on platform-based models, data-driven strategies, open innovation practices, and adaptive entrepreneurial capabilities. The study also identifies challenges related to technological uncertainty, funding limitations, cybersecurity risks, digital skills gaps, and ecosystem coordination. The research concludes that digital entrepreneurship models play a critical role in developing resilient innovation ecosystems by connecting entrepreneurs, investors, technology providers, customers, and knowledge institutions.

Keywords: Digital Entrepreneurship; Innovation Ecosystems; Digital Business Models; Startup Development; Technology Innovation; Entrepreneurial Strategy; Digital Transformation.

1. Introduction

The emergence of digital technologies has fundamentally transformed the entrepreneurial landscape by creating new opportunities for business creation, innovation development, and market expansion. Digital platforms, cloud computing, artificial intelligence, mobile technologies, and data analytics have enabled entrepreneurs to develop innovative solutions with fewer traditional limitations related to geographical boundaries and resource constraints. As a result, digital entrepreneurship has become an important research area focused on understanding how technology-enabled ventures create value and contribute to emerging innovation ecosystems.

Digital entrepreneurship differs from conventional entrepreneurship because it relies heavily on digital resources, technology-based processes, and interconnected networks. Entrepreneurs today can

utilize digital platforms to access customers, collaborate with partners, analyse market trends, and scale their ventures rapidly. These capabilities have encouraged the development of new entrepreneurial models that emphasize flexibility, innovation, and ecosystem participation rather than traditional business structures alone.

Innovation ecosystems provide a supportive environment where entrepreneurs, investors, research institutions, technology providers, and customers collaborate to generate new ideas and transform them into market-oriented solutions. Digital entrepreneurship models strengthen these ecosystems by enabling knowledge exchange, resource sharing, and collaborative innovation. Through digital networks and platforms, entrepreneurs can access opportunities that were previously limited by financial, geographical, and organizational barriers.

However, the development of digital entrepreneurship ecosystems also presents several challenges. Entrepreneurs must manage technological uncertainty, cybersecurity concerns, competitive pressures, and rapidly changing market expectations. Additionally, successful participation in digital innovation ecosystems requires strong digital skills, strategic capabilities, and access to supportive infrastructure. Therefore, understanding effective digital entrepreneurship models is essential for developing sustainable and competitive innovation environments.

This study examines digital entrepreneurship models that support emerging innovation ecosystems by analysing their conceptual foundations, strategic contributions, implementation challenges, and future opportunities. The research aims to provide insights into how technology-driven entrepreneurial approaches can strengthen innovation networks and promote sustainable economic development.

2. Review of Literature

2.1 Evolution of Digital Entrepreneurship Models

Digital entrepreneurship has evolved from traditional technology-based business creation toward broader ecosystem-oriented approaches that integrate digital platforms, data resources, and collaborative networks. Earlier entrepreneurial models primarily focused on individual ventures and internal capabilities, whereas modern digital entrepreneurship emphasizes connectivity, scalability, and technology-enabled value creation.

Research indicates that digital entrepreneurship models provide entrepreneurs with greater flexibility by reducing entry barriers and enabling rapid experimentation. Digital platforms allow startups and emerging ventures to reach global markets, develop customer relationships, and access innovation resources more efficiently.

2.2 Digital Platforms and Innovation Ecosystem Development

Digital platforms have become central components of emerging innovation ecosystems by connecting entrepreneurs, users, investors, and technology providers. Platform-based business models enable collaborative value creation and support the development of innovative products and services through network effects.

Existing studies highlight that successful digital ecosystems depend on platform governance, stakeholder participation, and continuous innovation. Entrepreneurs utilizing digital platforms can

benefit from broader market access and improved resource availability while contributing to ecosystem growth.

2.3 Entrepreneurial Capabilities and Technology-Driven Innovation

Technology-driven entrepreneurship requires a combination of digital skills, strategic thinking, innovation capability, and adaptability. Entrepreneurs must understand emerging technologies and utilize them effectively to develop competitive solutions. Digital capabilities influence opportunity recognition, business model development, and innovation performance.

Literature suggests that entrepreneurial success in digital environments depends not only on technological adoption but also on the ability to build partnerships, manage knowledge, and respond quickly to market changes. These capabilities strengthen the sustainability of innovation ecosystems.

3. Objectives of the Study

3.1 Understanding the Role of Digital Entrepreneurship in Emerging Innovation Ecosystems

The primary objective of this study is to examine the role of digital entrepreneurship models in supporting the development and growth of emerging innovation ecosystems. The research focuses on understanding how technology-enabled entrepreneurial approaches create new opportunities for startups, digital ventures, and collaborative business networks.

Digital entrepreneurship has transformed traditional entrepreneurial activities by enabling faster innovation cycles, broader market access, and improved resource utilization through digital platforms and advanced technologies. This objective aims to analyse how digital entrepreneurship contributes to ecosystem development by connecting entrepreneurs, investors, customers, technology providers, and knowledge institutions.

Furthermore, this objective seeks to explore the relationship between digital entrepreneurial capabilities and innovation ecosystem performance. The study examines how digital skills, technological adoption, platform utilization, and strategic flexibility influence entrepreneurial success in dynamic markets. It also evaluates how digital entrepreneurship models support knowledge sharing, collaborative innovation, and sustainable venture development. By analysing these factors, the research aims to establish the importance of digital entrepreneurship as a foundation for creating resilient and adaptive innovation ecosystems.

3.2 Evaluating Digital Entrepreneurship Models and Their Contribution to Innovation Development

The second objective of this study is to evaluate different digital entrepreneurship models that support innovation development within emerging ecosystems. The research examines platform-based entrepreneurship, digital service models, data-driven ventures, technology-enabled startups, and collaborative innovation approaches.

These models are analysed to understand how entrepreneurs utilize digital resources to create value, develop scalable solutions, and respond to changing market requirements. The objective focuses on identifying the strategic mechanisms through which digital entrepreneurship promotes creativity, market expansion, and competitive advantage.

In addition, this objective aims to investigate how digital entrepreneurship models integrate technological capabilities with business strategy and customer-oriented innovation. The study explores the importance of digital platforms, artificial intelligence, cloud technologies, and data analytics in improving entrepreneurial decision-making and operational efficiency. It emphasizes that successful digital entrepreneurship requires a combination of technological knowledge, innovative thinking, and ecosystem collaboration. Through this evaluation, the research aims to identify effective entrepreneurial approaches for strengthening future innovation networks.

3.3 Identifying Challenges and Future Directions for Digital Entrepreneurial Ecosystems

The third objective of this study is to identify major challenges affecting the implementation and sustainability of digital entrepreneurship models within innovation ecosystems. The research examines issues such as limited access to funding, cybersecurity risks, digital skill gaps, technological uncertainty, regulatory concerns, and difficulties in ecosystem coordination.

These challenges can influence entrepreneurial growth and reduce the ability of digital ventures to compete effectively in rapidly changing markets. Understanding these barriers is essential for developing supportive frameworks that enable sustainable digital entrepreneurship. Additionally, this objective seeks to explore future directions for strengthening digital entrepreneurial ecosystems through technological innovation, policy support, and collaborative development.

The study investigates the potential role of artificial intelligence, digital platforms, startup networks, entrepreneurship education, and open innovation frameworks in enhancing ecosystem performance. It highlights the importance of creating inclusive and adaptive environments where entrepreneurs can access resources, knowledge, and opportunities. By identifying future possibilities, this research contributes toward developing stronger digital entrepreneurship models capable of supporting emerging innovation ecosystems.

4. Research Methodology

4.1 Research Design and Conceptual Framework

This study adopts a conceptual research design to examine digital entrepreneurship models and their contribution to emerging innovation ecosystems. The conceptual approach is appropriate because the research focuses on analysing existing entrepreneurship theories, digital innovation frameworks, ecosystem development concepts, and technology-driven business practices rather than conducting direct empirical experimentation.

The study integrates perspectives from digital entrepreneurship, innovation management, strategic business development, and technology ecosystems to understand how entrepreneurs utilize digital capabilities for creating sustainable ventures.

The conceptual framework of the study is structured around the relationship between digital entrepreneurial models, technological capabilities, ecosystem collaboration, and innovation outcomes. It considers digital entrepreneurship as a strategic mechanism that enables entrepreneurs to access resources, develop scalable solutions, and participate in interconnected innovation networks. The framework evaluates how digital platforms, data resources, and collaborative approaches contribute to the growth and sustainability of emerging entrepreneurial ecosystems.

4.2 Data Sources and Literature Analysis Approach

The study utilizes secondary data sources collected from peer-reviewed research articles, academic publications, entrepreneurship frameworks, digital transformation studies, and innovation ecosystem literature.

The literature-based methodology enables systematic examination of existing knowledge related to digital business models, startup development, technology adoption, and collaborative innovation networks. The selected sources provide theoretical and practical insights into how digital entrepreneurship supports emerging innovation environments.

The literature analysis process involved identifying major themes related to digital platforms, entrepreneurial capabilities, innovation collaboration, ecosystem development, and technology-enabled value creation. The collected information was categorized according to entrepreneurial models, technological drivers, ecosystem benefits, and implementation challenges. This thematic analysis approach helped establish relationships between digital entrepreneurship practices and innovation ecosystem development.

4.3 Analytical Framework and Evaluation Parameters

The analytical framework evaluates digital entrepreneurship models through multiple dimensions, including technological capability, scalability potential, ecosystem collaboration, innovation capacity, and market adaptability.

These parameters were selected because they represent important indicators for assessing the effectiveness of digital entrepreneurial approaches in supporting emerging innovation ecosystems. The framework provides a structured approach for understanding how digital ventures create value and achieve sustainable growth.

The evaluation process considers both technological and entrepreneurial factors influencing ecosystem development. Technological factors include digital platforms, data utilization, automation, and connectivity, while entrepreneurial factors include opportunity recognition, strategic flexibility, innovation capability, and partnership development. This multidimensional evaluation approach enables a comprehensive assessment of digital entrepreneurship models and their contribution to innovation-driven growth.

4.4 Research Procedure and Interpretation Method

The research procedure followed a structured process involving identification of digital entrepreneurship concepts, analysis of entrepreneurial models, evaluation of ecosystem contributions, and interpretation of future development opportunities. Qualitative thematic analysis was applied to examine patterns within the collected literature and identify significant relationships between digital entrepreneurship strategies and innovation ecosystem outcomes.

The interpretation process involved comparative analysis of different digital entrepreneurship models and their influence on ecosystem development. The findings were synthesized to identify effective entrepreneurial practices, implementation barriers, and future opportunities. Ethical considerations related to responsible technology adoption, digital inclusion, data security, and sustainable innovation development were also considered throughout the research process.

Table 1: Research Methodology Framework

Research Component	Description
Research Design	Conceptual research design based on digital entrepreneurship and innovation ecosystem frameworks
Data Sources	Peer-reviewed studies, entrepreneurship literature, digital innovation research, and ecosystem development models
Research Approach	Qualitative thematic analysis and conceptual synthesis
Evaluation Parameters	Technology capability, scalability, ecosystem collaboration, innovation capacity, and adaptability
Interpretation Method	Comparative analysis of digital entrepreneurship models and innovation ecosystem contributions

Table Interpretation: The methodology framework demonstrates that the study follows a structured conceptual approach by combining entrepreneurship perspectives with digital innovation ecosystem analysis. The selected components support systematic evaluation of how digital entrepreneurship models contribute to emerging innovation networks and sustainable venture development.

5. Analysis

5.1 Evaluation of Digital Entrepreneurship Models and Ecosystem Development

The analysis indicates that digital entrepreneurship models have become important mechanisms for supporting emerging innovation ecosystems by enabling entrepreneurs to utilize technology, networks, and digital resources for value creation.

Unlike traditional entrepreneurship models that often depend on physical infrastructure and limited market reach, digital entrepreneurship enables scalable operations through online platforms, cloud-based services, and technology-enabled communication channels. These capabilities allow entrepreneurs to develop innovative solutions, access wider markets, and collaborate with diverse ecosystem participants.

Furthermore, the effectiveness of digital entrepreneurship models depends on the integration of technological capabilities with entrepreneurial skills and ecosystem support. Digital platforms, data analytics, and artificial intelligence provide opportunities for improving business efficiency and innovation capacity, but successful implementation requires strategic planning, market understanding, and continuous adaptation. The analysis suggests that entrepreneurs who combine digital capabilities with collaborative approaches are better positioned to create sustainable ventures within emerging innovation ecosystems.

5.2 Impact of Digital Platforms and Innovation Networks on Entrepreneurial Growth

Digital platforms have significantly influenced entrepreneurial growth by creating interconnected environments where entrepreneurs, investors, customers, and technology providers can collaborate. The analysis demonstrates that platform-based entrepreneurship models support faster innovation, improved resource accessibility, and broader market participation. These platforms reduce traditional entry barriers and allow emerging ventures to experiment with new ideas while receiving feedback from ecosystem participants.

The findings also indicate that innovation networks strengthen entrepreneurial performance by promoting knowledge sharing and collaborative problem-solving. Startups and digital ventures benefit from partnerships with research institutions, industry organizations, and technology communities. However, effective ecosystem development requires proper coordination, trust-building mechanisms, and supportive digital infrastructure to ensure that all participants can contribute effectively.

5.3 Comparative Assessment of Digital Entrepreneurship Models

The comparative assessment examines major digital entrepreneurship models, including platform-based ventures, data-driven entrepreneurship, digital service models, technology startup ecosystems, and collaborative innovation models. These approaches represent different pathways through which entrepreneurs utilize digital technologies to create value and participate in innovation ecosystems. The analysis highlights that each model contributes differently depending on market requirements, technological capabilities, and ecosystem conditions.

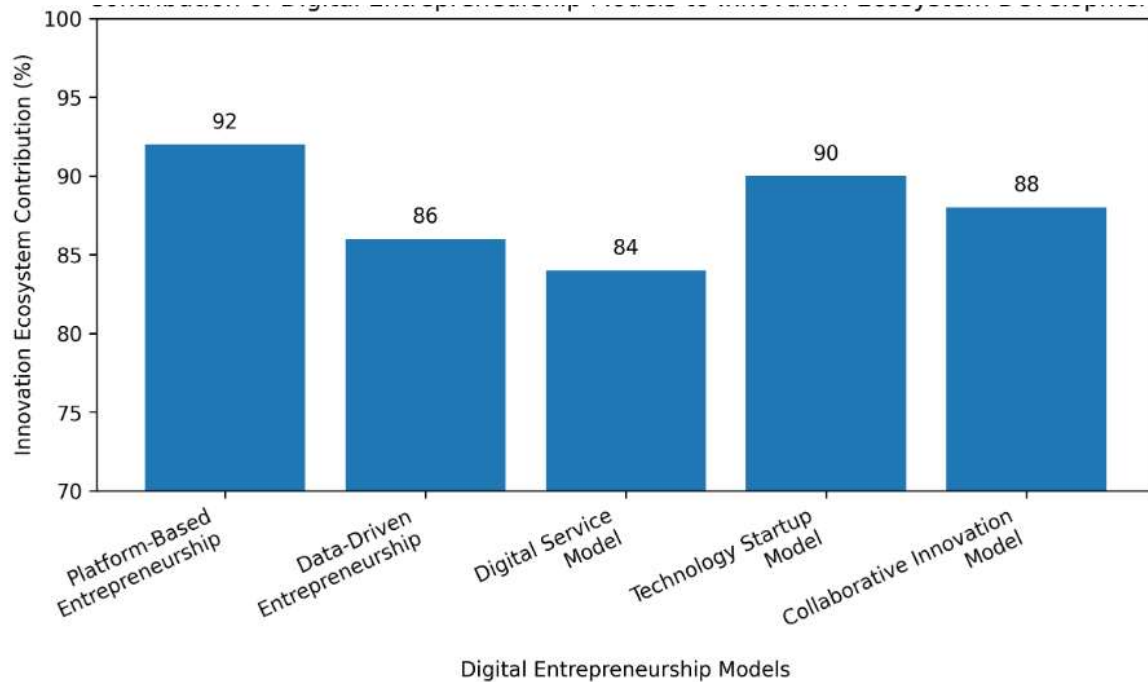
The findings suggest that platform-based and data-driven entrepreneurship models provide strong opportunities for scalability and innovation because they utilize network effects and analytical capabilities. Collaborative innovation models strengthen ecosystem relationships, while digital service models improve customer accessibility and market responsiveness. Therefore, successful digital entrepreneurship ecosystems require integration of multiple entrepreneurial approaches rather than dependence on a single model.

Table 2: Comparative Analysis of Digital Entrepreneurship Models

Digital Entrepreneurship Model	Primary Focus	Entrepreneurial Benefit	Ecosystem Contribution
Platform-Based Entrepreneurship	Digital marketplace and network connectivity	High scalability and market access	Very High
Data-Driven Entrepreneurship	Analytics-based value creation	Improved decision-making and innovation	High
Digital Service Model	Online services and customer solutions	Flexible business expansion	High
Technology Startup Model	Technology development and innovation	Creation of advanced solutions	Very High

Table Interpretation: The table demonstrates that platform-based and technology startup models provide the highest ecosystem contribution because they support scalability, innovation creation, and wider collaboration. Data-driven and collaborative models also provide significant value by improving decision-making and strengthening entrepreneurial networks.

Graph 1: Contribution of Digital Entrepreneurship Models to Innovation Ecosystem Development



Key Finding: The graph indicates that Platform-Based Entrepreneurship (92%) provides the highest contribution toward innovation ecosystem development, followed by Technology Startup Models (90%) and Collaborative Innovation Models (88%).

Interpretation: The column chart illustrates the comparative contribution of different digital entrepreneurship models in supporting emerging innovation ecosystems. Platform-based entrepreneurship achieves the highest contribution because digital platforms enable large-scale connectivity, market access, and collaboration among ecosystem participants.

Technology startup models contribute through advanced innovation development and technological solutions, while collaborative innovation models strengthen knowledge exchange and partnership networks.

Data-driven and digital service models also support ecosystem growth by improving decision-making and customer-oriented value creation. The findings indicate that future innovation ecosystems will depend on integrated digital entrepreneurship models combining technology, collaboration, and scalable business approaches.

6. Challenges

6.1 Digital Skill Gaps and Entrepreneurial Capability Limitations

One of the major challenges affecting digital entrepreneurship models is the shortage of advanced digital skills and entrepreneurial capabilities among emerging entrepreneurs. Successful digital ventures require

knowledge of technologies such as artificial intelligence, data analytics, cloud computing, cybersecurity, and digital platform management. However, many entrepreneurs face difficulties in acquiring and applying these skills effectively, which can limit their ability to develop competitive digital solutions. The rapidly changing nature of technology further increases the challenge because entrepreneurs must continuously update their knowledge and adapt to new digital trends.

Furthermore, entrepreneurial success in digital ecosystems requires more than technical knowledge. Entrepreneurs must also possess strategic thinking, innovation capability, market understanding, and collaboration skills to transform technological opportunities into sustainable business models. Limited access to entrepreneurship education, professional mentoring, and innovation networks can restrict the growth potential of digital ventures.

Therefore, developing comprehensive digital entrepreneurship training programs and strengthening knowledge-sharing mechanisms are essential for building capable participants within emerging innovation ecosystems.

6.2 Funding Constraints and Ecosystem Development Barriers

Another significant challenge faced by digital entrepreneurs is limited access to financial resources and supportive ecosystem infrastructure. Developing technology-based ventures often requires investment in research, digital infrastructure, skilled employees, and market development activities. Early-stage startups may experience difficulties in attracting investors due to technological uncertainty, competitive pressures, and unclear market outcomes. Limited funding availability can slow innovation processes and reduce the ability of entrepreneurs to scale their digital solutions.

In addition, the effectiveness of innovation ecosystems depends on strong coordination among entrepreneurs, investors, research institutions, government organizations, and technology providers. Weak collaboration between ecosystem participants may reduce opportunities for knowledge exchange, resource sharing, and innovation development. Creating supportive environments requires effective policies, investment networks, incubation programs, and collaborative platforms that enable entrepreneurs to access the resources needed for sustainable growth.

6.3 Cybersecurity Risks and Responsible Digital Innovation Challenges

The increasing dependence on digital platforms and online technologies creates important challenges related to cybersecurity and responsible innovation. Digital entrepreneurs often manage sensitive business information, customer data, and technology-based services, making them vulnerable to cyber threats, data breaches, and privacy concerns. Maintaining secure digital infrastructure is essential for protecting stakeholder trust and ensuring the long-term sustainability of digital ventures.

Moreover, digital entrepreneurship models must address ethical and responsible innovation considerations while developing new technologies and business solutions. Rapid technological development may create concerns related to data misuse, digital inequality, and unintended social impacts. Entrepreneurs must adopt responsible technology practices that consider user privacy, transparency, accessibility, and social value creation. Building secure and ethical digital ecosystems will be essential for ensuring sustainable innovation and long-term entrepreneurial success.

7. Discussion

7.1 Strategic Role of Digital Entrepreneurship in Innovation Ecosystem Development

The findings of this study demonstrate that digital entrepreneurship has become a significant driver of emerging innovation ecosystems by enabling new forms of value creation, collaboration, and market participation. Digital entrepreneurship models provide entrepreneurs with opportunities to develop scalable ventures through digital platforms, advanced technologies, and interconnected networks.

The analysis indicates that these models have expanded entrepreneurial possibilities beyond traditional business boundaries by allowing startups and emerging ventures to access global markets, digital resources, and collaborative innovation opportunities. The discussion further highlights that digital entrepreneurship is not limited to technology adoption but represents a broader transformation in entrepreneurial thinking and business development. Successful digital ventures require a combination of technological capabilities, strategic vision, market awareness, and ecosystem participation. Entrepreneurs who effectively integrate digital tools with innovative business strategies are better positioned to create sustainable solutions and contribute to the growth of dynamic innovation ecosystems.

7.2 Importance of Digital Platforms and Collaborative Networks

The analysis reveals that digital platforms and collaborative networks play a central role in strengthening entrepreneurial ecosystems by connecting diverse stakeholders. Platforms enable entrepreneurs, customers, investors, researchers, and technology providers to interact, exchange knowledge, and develop innovative solutions. These interconnected environments reduce traditional barriers to entrepreneurship and support faster experimentation, market validation, and business scaling.

However, the discussion emphasizes that successful digital ecosystems require effective governance, trust, and coordinated participation among stakeholders. Digital platforms alone cannot guarantee innovation success without supportive infrastructure, skilled participants, and strategic collaboration. Future entrepreneurial ecosystems must focus on creating inclusive digital environments where entrepreneurs can access resources, mentorship, funding opportunities, and knowledge networks to support sustainable venture development.

7.3 Future Directions for Digital Entrepreneurship Ecosystems

The future development of digital entrepreneurship ecosystems will increasingly depend on the integration of emerging technologies, entrepreneurial capabilities, and collaborative innovation frameworks.

Technologies such as artificial intelligence, blockchain, cloud computing, and advanced analytics are expected to create new opportunities for developing innovative business models and improving entrepreneurial decision-making. These technologies can enhance scalability, efficiency, and market responsiveness while supporting the creation of technology-driven ventures.

Furthermore, future digital entrepreneurship models should focus on sustainability, inclusiveness, and responsible innovation. Entrepreneurs and ecosystem stakeholders must address challenges related to cybersecurity, digital accessibility, ethical technology use, and skill development. The discussion suggests that successful innovation ecosystems will require continuous collaboration between entrepreneurs, investors, educational institutions, policymakers, and technology organizations. By

combining digital capabilities with strategic ecosystem development, future enterprises can achieve sustainable growth and contribute to broader economic innovation.

8. Conclusion

Digital entrepreneurship models have become important foundations for developing emerging innovation ecosystems by enabling entrepreneurs to utilize digital technologies, collaborative networks, and innovative business approaches. This study highlights that digital entrepreneurship has transformed traditional entrepreneurial practices by providing new opportunities for venture creation, market expansion, and technology-enabled value generation. Digital platforms, data-driven strategies, and technology-based business models allow entrepreneurs to overcome geographical limitations and participate in interconnected innovation networks.

The analysis demonstrates that successful digital entrepreneurship depends on the integration of technological capabilities, entrepreneurial skills, ecosystem collaboration, and strategic adaptability. Models such as platform-based entrepreneurship, technology startups, data-driven ventures, and collaborative innovation approaches contribute significantly to ecosystem development by supporting scalability, knowledge sharing, and innovation creation. However, technology adoption alone cannot ensure entrepreneurial success; organizations must also develop strong management capabilities, market understanding, and sustainable innovation practices.

The study further concludes that digital entrepreneurs face several challenges, including digital skill limitations, funding constraints, cybersecurity risks, and difficulties in coordinating ecosystem relationships. Addressing these challenges requires supportive policies, entrepreneurship education, investment networks, secure digital infrastructure, and collaborative frameworks. Innovation ecosystems can become more effective when entrepreneurs receive access to resources, mentorship, technological support, and opportunities for knowledge exchange.

In conclusion, digital entrepreneurship models represent a critical pathway for supporting future innovation ecosystems in technology-driven economies. The future success of digital ventures will depend on the ability to combine technological advancement with entrepreneurial creativity, responsible innovation, and collaborative ecosystem development.

Organizations and stakeholders that successfully build adaptive and inclusive digital ecosystems will be better positioned to promote sustainable entrepreneurship, economic growth, and continuous innovation.

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