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Entrepreneurship in the era of society 5.0: Navigating digitalization for innovation and growth

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Abstract
Purpose: This study examines the relationship between entrepreneurship and digitalization in Society 5.0, highlighting how entrepreneurs can leverage digital technologies for innovation and economic growth.
Research Methodology: This study used a quantitative approach with 200 Indonesian entrepreneurs utilizing digital technology. Data were collected via an online questionnaire and analyzed using SEM-PLS in Smart PLS to explore digitalization's impact on innovation and growth.
Results: The findings show that digital technologies such as AI, the Internet of Things, and big data help entrepreneurs innovate products, improve efficiency, and expand markets. These technologies provide global market access, enhance customer experience, and increase business sustainability, making entrepreneurs more competitive and adaptable.
Conclusions: Entrepreneurs in Society 5.0 must adopt digitalization for business growth, overcoming challenges like technology dependence, security risks, and skill gaps. Collaboration between the government, private sector, and educational institutions is key to addressing these obstacles.
Limitations: The study's limitations include reliance on self-reported data, regional focus, and exclusion of other entrepreneurial factors such as social and environmental impact. Future research could address these gaps by exploring broader contexts and variables in the study.
Contributions: This research contributes to the development of digital policies, enhances the understanding of entrepreneurship in Society 5.0, and provides strategies for leveraging digital technologies in business innovation and growth.

Keywords: *Digitalization, Entrepreneurship, Growth, Innovation, Society 5.0*

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1. Introduction

Entrepreneurship is constantly evolving, and in the era of Society 5.0, it is crucial for entrepreneurs to navigate the challenges and opportunities presented by digitalization to drive innovation and achieve growth in their businesses. By understanding the digital toolbox employed by pioneering organizations, entrepreneurs can generate novel questions for entrepreneurship, business models, and ecosystems, ultimately leading to new ways of thinking about trust and institutional logics (George, Merrill, & Schillebeeckx, 2021). Furthermore, by embracing digital sustainability activities, entrepreneurial organizations can address complex societal challenges and positively impact society. To succeed in the era of Society 5.0, entrepreneurs need to not only adapt their strategies and business models to align with digital technologies, but also develop a deep understanding of the factors that facilitate and constrain them (Elia, Margherita, & Passiante, 2020). This understanding, combined with the formation of durable and adaptive institutions and networks, supports entrepreneurial firm development and sustains technology-based growth (Satalkina & Steiner, 2020).

Entrepreneurship in the era of Society 5.0 requires a proactive approach to embrace digitalization and leverage it for innovation and growth. Society 5.0 was first introduced by the Japanese government as part of a strategy to address social and economic challenges through technological innovations. This concept was introduced in 2016 in Japan's 5th Basic Science and Technology Policy. Society 5.0 aims to create a human-centered society in which advanced technologies such as Artificial Intelligence (AI), Internet of Things (IoT), big data, and robotics are integrated into daily life to improve the quality of life. Society 5.0 is a concept that integrates advanced technologies such as AI and IoT into daily life to improve the quality of human life. Unlike the previous stages of Society 1.0 (hunter and gatherer), Society 2.0 (agrarian), Society 3.0 (industrial), and Society 4.0 (information), Society 5.0 emphasizes the integration of technology for human well-being and sustainability, as well as solutions to societal challenges such as population aging and climate change (Fukuyama, 2018; Laboratory, 2020). The biggest challenge faced by entrepreneurs in the Society 5.0 era is the business paradigm shift characterized by this era. Technology has become a major force that fundamentally changes the business landscape, creating significant opportunities and uncertainties. Digitalization is the key to optimizing these opportunities, especially in marketing Micro, Small, and Medium Enterprises (MSMEs) products. However, the readiness of MSMEs to adapt to digitalization has not been fully realized, so they face a significant paradigm shift in facing the Society 5.0 era, as shown in Figure 1 (Febrianita, Mumpuni, Sholihatin, & Septian, 2023).

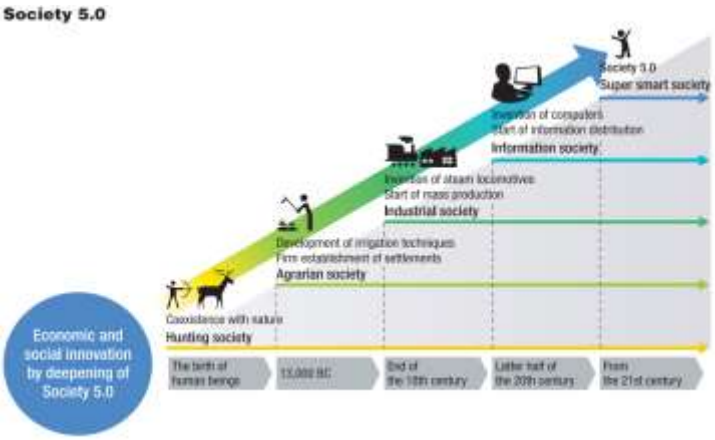

Figure 1. Society 5.0 era (Fukuyama, 2018)

In an era where digitalization is rapidly transforming the business landscape, entrepreneurs must delve deeper into the nuances and implications of this digital shift. The digital toolbox utilized by leading organizations serves as a reservoir of inspiration for entrepreneurs, prompting them to re-evaluate traditional paradigms and envision innovative approaches to entrepreneurship (Nambisan, 2017). This exploration of digital tools not only sparks fresh perspectives on business models and ecosystems but also fosters a revaluation of trust and institutional logics in the digital age (George et al., 2021). Furthermore, the concept of digital sustainability presents entrepreneurs with the opportunity to address

complex societal issues through organizational activities. By embracing digital sustainability, entrepreneurial ventures can play a pivotal role in positively impacting society while pursuing growth and innovation (Ablyazov, Asaturova, & Koscheyev, 2018). This requires a comprehensive understanding of the interconnectedness between digital technology and societal challenges, compelling entrepreneurs to adopt a proactive stance in leveraging digitalization for social good (Antonizzi & Smuts, 2020).

In addition to adapting their strategies to align with digital technologies, entrepreneurs must cultivate a profound understanding of the multifaceted factors that both enable and hinder their endeavours (Schneider, 2019). This entails not only embracing digitalization in a passive sense but actively engaging with its intricacies and potential constraints (Kraus, Palmer, Kailer, Kallinger, & Spitzer, 2019). In doing so, entrepreneurs can lay the groundwork for durable and adaptive institutions and networks that are essential for fostering sustainable growth and technological advancement in the entrepreneurial realm (Gregori & Holzmann, 2020). In conclusion, navigating digitalization goes beyond the mere adoption of digital tools; it necessitates a holistic understanding of digital sustainability, societal impact, and the intricate dynamics of digitalization (Bican & Brem, 2020). In the Society 5.0 era, proactive engagement with digitalization is imperative for entrepreneurs seeking to drive innovation and sustainable growth (George et al., 2021).

Although significant research has focused on digital transformation in established companies, there is a gap in understanding how emerging entrepreneurs recognize and leverage the opportunities created by the integration of physical and digital systems in Society 5.0. Initial studies, such as those by Nambisan, Wright, and Feldman (2019), have begun to address this issue; however, further research is required to investigate the cognitive processes and decision-making strategies that entrepreneurs employ in highly digitalized contexts. In Society 5.0, the entrepreneurial ecosystem involves intricate interactions among startups, established companies, government bodies, and research institutions. Further research is needed to understand how digital entrepreneurial ecosystems develop and how entrepreneurs can effectively navigate and contribute to them in Society 5.0.

2. Literature Review and Hypotheses Development

2.1 Entrepreneurship

Entrepreneurship embodies the spirit of innovation, risk-taking, and perseverance in the pursuit of creating value. It is not just about starting a business; it is a mindset, a way of thinking and acting that drives individuals to identify opportunities, marshal resources, and bring about change in the world (Medín, Losada-Lopez, & Montes-Solla, 2016). Innovation is the heart of entrepreneurship. Entrepreneurs are often driven by the desire to solve problems or meet new and better requirements. This requires creativity, the ability to think outside the box, see possibilities where others see obstacles, and generate novel solutions (Zhao & Zhang, 2021). Entrepreneurship involves inherent risks. Whether investing in personal savings, quitting a stable job, or pursuing a new idea with no guarantee of success, entrepreneurs must be willing to take calculated risks (Choi & Markham, 2019). They understand that failure is a possibility but also recognize that it is often a stepping stone to the eventual success. Successful entrepreneurs possess a keen eye for spotting opportunities that others may overlook (Satalkina & Steiner, 2020). They are adept at identifying market gaps, emerging trends, and unmet needs. Moreover, they have a clear vision of what they want to achieve and the impact they aspire to have on their students.

2.2 Era of Society 5.0

Society 5.0 envisions a future in which cutting-edge technologies are fused with human-centered values to address global challenges and enhance quality of life. This concept evolved from earlier societal stages, spanning hunter-gatherer societies (Society 1.0), industrialization (Society 2.0), the digital era (Society 3.0), and the age of connectivity and information (Society 4.0) (Ellitan, 2020). Society 5.0 emphasizes the integration of advanced technologies such as AI, robotics, IoT, biotechnology, and big data analytics while prioritizing human needs, values, and well-being over mere technological progress (Apdillah, Panjaitan, Stefanny, & Surbakti, 2022). Society 5.0 envisions a world in which the boundaries between the physical and digital realms are blurred, creating interconnected ecosystems that

enhance efficiency, productivity, and convenience (Sudibjo, Idawati, & Harsanti, 2019). This convergence facilitates the creation of smart cities, intelligent infrastructure, and interconnected networks that optimize resource utilization and enhance the quality of life for citizens (Rahmawati, Ruslan, & Bandarsyah, 2021). Society 5.0 envisions a world in which the boundaries between the physical and digital realms are blurred, creating interconnected ecosystems that enhance efficiency, productivity, and convenience. This convergence facilitates the creation of smart cities, intelligent infrastructure, and interconnected networks that optimize resource utilization and enhance the quality of life of citizens (Fukuyama, 2018).

2.3 Digitalization

Digitalization fundamentally changes processes, systems, and societies by integrating digital technologies. This includes adopting digital tools, platforms, and strategies to simplify operations, improve efficiency, and foster innovation across various sectors (Bernini, Ferretti, & Angelini, 2022). This article delves into the principles, effects, and consequences of digitalization. At its core, digitalization converts analog processes and systems into digital systems. This implies the digitization of data, workflows, and communication channels to enable quicker, more precise, and more economical operations (Bernini et al., 2022). Digital transformation typically includes automating manual tasks, using cloud-based solutions, and incorporating data analytics to enhance decision-making processes. Digitalization enables constant connectivity, allowing smooth communication and collaboration regardless of location. With the rise of connected devices like smartphones, wearables, and smart appliances, an interconnected environment emerges, facilitating instant information exchange, remote resource access, and innovative forms of interaction (Almeida, Santos, & Monteiro, 2020). A key aspect of digitalization is managing large volumes of data. Through data analytics, machine learning, and AI, organizations can extract valuable insights, recognize patterns, and make informed, data-driven choices to enhance efficiency, predict customer preferences, and seize emerging prospects (Sjödin, Parida, Leksell, & Petrovic, 2018).

2.4 Innovation

Innovation propels progress and society by turning concepts into practical solutions that tackle crucial issues, enhance living standards, and open new avenues (Akram & Haq, 2022). Innovation is more than just invention; it involves questioning existing norms, pushing limits, and instigating beneficial transformations. This study explores the principles, methodologies, and consequences of this innovation. Innovation begins with imaginative thinking, envisioning fresh perspectives, challenging assumptions, and producing original concepts (Khan et al., 2022). This requires redefining problems, considering unconventional answers, and embracing ambiguity and unpredictability as opportunities for exploration and advancement (Le & Lei, 2019). Innovation is a continuous process that includes experimentation, feedback, and improvement (Z. Song, Zhu, & Shi, 2023). Through methods such as rapid prototyping, design thinking, or lean startup practices, innovators test their ideas, collect data, and refine their approaches to achieve ongoing progress and innovation (Knudsen, Zedtwitz, Griffin, & Barczak, 2023). Significant innovation often arises when ideas from various fields are combined, leading to new insights and discoveries (Ma & Zhang, 2021). Collaboration across disciplines, whether in science, technology, the arts, or the humanities, encourages the exchange of ideas, boosts creativity, and drives innovation by combining different expertise and viewpoints (Handayani, Wahyudi, & Suharnomo, 2017).

2.5 Growth

Growth is the innate desire for advancement and expansion, evident in various aspects of life, including personal development, organizational success and societal progress. It represents a journey toward improvement, evolution, and the fulfilment of potential, as it delve deeply into the concept of growth (Stoica, Roman, & Rusu, 2020). At the individual level, growth refers to the ongoing processes of self-enhancement, learning, and personal maturation. It entails broadening one's knowledge, honing skills, and developing capabilities, along with fostering self-awareness, resilience, and emotional intelligence (Hopenhayn, Neira, & Singhania, 2022). Personal growth is driven by curiosity, self-reflection, and dedication to lifelong learning, as individuals aspire to achieve their full potential and evolve into their optimal selves.

Growth involves pursuing advancement, mastery, and satisfaction in one's career and professional life. This includes setting ambitious objectives, refining specialized skills, and actively seeking opportunities for career advancement and progression (Polunin, Kourenkov, & Polunina, 1998). Professional growth is motivated by ambition, diligence, and commitment to excellence, as individuals aim for success and strive to make significant contributions to their respective fields. In the context of businesses and organizations, growth signifies the expansion, advancement, and prosperity of an entity (Doepke & Zilibotti, 2014). This encompasses boosting revenue, market share, and profitability, expanding operations, entering new markets, and diversifying product lines. Organizational growth necessitates strategic planning, innovation, and efficient implementation, along with a strong organizational culture that encourages collaboration, flexibility, and adaptability (Hau et al., 2024).

2.6 Hypothesis Development

2.6.1 Digitalisation and Innovation

The study of Jing, Xia, Li, Fan, and Ming (2024) on Wuhan's new display industry discovered that digital industrialization promotes itself, whereas industrial digitization operates independently and influenced by external factors. Technological innovation in enterprises involves complex and dynamic reactions. The study recommends that the government support the integration of digital technology into traditional industries and encourage internal digitization to strengthen technological innovation platforms. Wang (2022) explores how a strategic focus on digitalization affects organizational performance. They found that a strategic orientation towards digitalization is positively linked to digital capabilities such as digital knowledge and innovation. Additionally, this study highlights that resistance to innovation negatively moderates the relationship between these capabilities and innovative organizational performance. The results indicate that digital knowledge and innovation capabilities significantly influence innovation performance in organizations. Based on the above empirical research, we propose the following hypothesis:

H_1: Digitalization has a positive contribution on innovation

2.6.2 Digitalisation and Entrepreneur Growth

Singh, Singh, and Dhir (2023) investigated how a strategic focus on digitalization impacts organizational performance. This reveals that a strategic emphasis on digitalization is positively linked to digital capabilities such as digital knowledge and innovation. Additionally, the study underscores that resistance to innovation negatively moderates the relationship between these capabilities and organizational performance**.** explored how enterprise digitization influences green innovation. They found that digital transformation significantly boosts green innovation by easing financing constraints and increasing risk-taking. The positive impact is more pronounced in areas with stringent environmental regulations and robust intellectual property protection, as well as in state-owned and heavily polluting companies. The proposed hypotheses are as follows:

H_2: Digitalization has a positive and significant contribution on growth in entrepreneurship

2.6.3 Innovation and Entrepreneur Growth

Innovation significantly affects entrepreneurship. The research conducted by A. A. Al-Qudah, Al-Okaily, and Alqudah (2022) examine how social entrepreneurship relates to sustainable development, with a focus on economic growth. Using structural equation modelling and bidirectional causality models, this study analyzed data from 15 RCEP countries. It finds a positive link between social entrepreneurship and sustainable development and growth, suggesting that social entrepreneurship can drive economic growth and sustainability by generating value and creating social impact. Singh et al. (2023) provides a comprehensive review of the interplay between Entrepreneurship, Technology, and Innovation (ETI). It outlines eight key research themes: innovation type, small venture performance, gender roles in digital entrepreneurship, entrepreneurial ecosystems, technological ventures, venture sustainability and growth, technology transfer, and government policies. This study underscores the crucial role of innovation in enhancing competitiveness and ensuring the long-term survival of firms, highlighting the need for continuous innovation to foster entrepreneurial growth.

H_3: Innovation has a positive and significant contribution on growth in entrepreneurship

2.3 Framework Model and Hypothesis

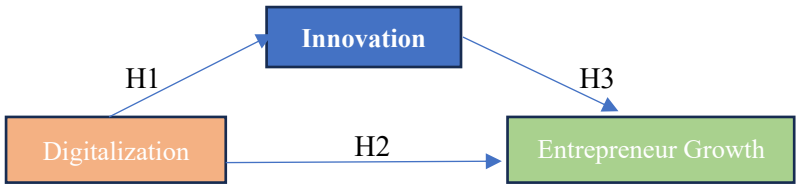

Figure 2. Framework model

From Figure 2, the following hypotheses are proposed:

- H_1: Digitalization has a positive contribution on innovation in entrepreneurship in the era of society 5.0
- H_2: Digitalization has a positive and significant contribution on growth in entrepreneurship in the era of society 5.0
- H_3: Innovation has a positive and significant contribution on growth in entrepreneurship in the era of society 5.0

3. Research Methodology

This study uses a quantitative research method to examine entrepreneurship in the era of Society 5.0, focusing on the role of digitalization in supporting innovation and business expansion. The population consisted of 200 entrepreneurs in Indonesia who had implemented digital technology in their businesses across sectors, such as trade, services, manufacturing, and information technology. The sample was selected using purposive sampling with criteria including at least two years of business operation, active use of digital technology, and willingness to participate in the study. Data were collected using a structured questionnaire that measured digital entrepreneurship, innovation, and business growth. The questionnaire covered the use of digital tools such as e-commerce, social media, and business applications, as well as product innovation, sales growth, market expansion, and the factors influencing technology adoption. The collected data were analyzed using statistical techniques with the support of Smart Partial Least Squares (SmartPLS) software to examine the relationships among the variables.

4. Results and Discussions

4.1 Result

Table 1. Instrument test for digitalization

Indicators		Validity Test			Reliability
	Estimate	P-Value	Validity	GFI	
$X_{1.1}$	1	0	Valid	0,961 (Valid	0,739
$X_{1.2}$	1,094	0,458	Valid	Unidimensional)	(Reliable)
$X_{1.3}$	1,361	0,516	Valid		
$X_{1.4}$	8,402	0,305	Valid		

The data in the Table 1 shows that all indicators ($X_{1.1}$, $X_{1.2}$, $X_{1.3}$, *and* $X_{1.4}$) are valid based on the given p-value. $X_{1.2}$ is also reliable, whereas information on the reliability of the other indicators is incomplete. The GFI for $X_{1.1}$ showed good validity, but GFI values were not available for the other indicators. The data in the table show that all the tested indicators are valid, with $X_{1.2}$ being declared reliable. The GFI for $X_{1.1}$ indicates good validity. This is important in the context of entrepreneurial growth supported by digitalization and innovation, as the validity and reliability of indicators ensure that the measurement tools used can be trusted to evaluate how digital technology and innovation contribute to the development of a business. With valid and reliable tools, this analysis can identify the factors that influence entrepreneurial growth in the digital era more accurately.

Table 2. Instrument test for innovation

Indicators		Validity Test			Reliability
	Estimate	P-Value	Validity	GFI	
$X_{2.1}$	1	0	Valid	0,974 (Valid	0,807
$X_{2.2}$	3,539	0,263	Valid	Unidimensional)	(Reliable)
$X_{2.3}$	6,106	0,095	Valid		

$X_{2.4}$	2,524	0,171	Valid		
$X_{2.5}$	0,347	0,426	Valid		

Table 2 shows all indicators ($X_{2.1}$ to $X_{2.5}$) were valid based on the p-values. $X_{2.1}$ shows good validity with a GFI of 0.807, although information on reliability was not mentioned. $X_{2.2}$ is also valid, reliable, and unidimensional, but the GFI is not available. Indicators $X_{2.3}$, $X_{2.4}$, and $X_{2.5}$ were valid, with p-values indicating good validity; however, information on reliability and GFI was not provided. All indicators ($X_{2.1}$ to $X_{2.5}$) were valid, indicating that the data obtained were reliable. In particular, $X_{2.1}$ shows good validity with a GFI of 0.807, which supports a solid analysis. The validity of these indicators, especially $X_{2.2}$, which is also reliable, allows for an effective evaluation of the relationship between innovation and entrepreneurial growth. The positive correlation between innovation aspects, as measured by these indicators, and entrepreneurial growth can be identified more clearly. The validity and reliability of the measurement tools support the understanding that good innovation contributes positively to business development and expansion, reflecting the importance of innovation in driving entrepreneurial growth.

Table 3. Instrument test for entrepreneur growth

Indicator		Validity Test			Reliability
	Estimate	P-Value	Validity	GFI	
$Y_{1.1}$	1	0	Valid	0,941 (Valid	0,742
$Y_{1.2}$	0,753	0,476	Valid	Unidimensional)	(Reliable)
$Y_{1.3}$	0,316	0,501	Valid		

Table 3 shows all indicators ($Y_{1.1}$, $Y_{1.2}$, *and* $Y_{1.3}$) are valid based on the given p-value. $Y_{1.1}$ has good validity, with a GFI of 0.742, although its reliability is not mentioned. $Y_{1.2}$ is also valid, reliable, and unidimensional, but the GFI was not available. $Y_{1.3}$ is valid with a p-value of 0.501, but information on reliability and GFI is not provided. The results show that all indicators ($Y_{1.1}$, $Y_{1.2}$, *and* $Y_{1.3}$) are valid, with $Y_{1.1}$, $Y_{1.2}$, and reliability. The good validity of these indicators supports an accurate analysis of the relationship between the measured aspects and entrepreneurial growth. For example, valid indicators such as $Y_{1.1}$ and $Y_{1.2}$ can provide solid insights into the factors affecting entrepreneurial growth. With valid and reliable data, we can better understand how certain elements contribute to business development and expansion and identify areas that may require attention to promote entrepreneurial growth.

4.1.1 Final Stage SEM Analysis Results

Table 4. Final test of goodnes of fit overall model

Goodness of Fit	Calculation Results	Cut-off	Information
Khi Kuadrat	159,779	small	Good Fit
P-Value	0,449	> 0,05	Good Fit
RMSEA	0,006	≤ 0,08	Good Fit
GFI	0,948	≥ 0,90	Good Fit
AGFI	0,913	≥ 0,90	Good Fit
Khi Kuadrat/df	1,038	≤ 2	Good Fit

Table 4 shows the analysis results showed that the model had a good fit with the data. The p-value of 0.449 indicates no significant mismatch. The low RMSEA (0.006), high GFI (0.948), and AGFI (0.913) indicated a good model fit. In addition, the ratio of chi-square to degrees of freedom (1.038) indicates a good model fit. Overall, all indicators showed that the model fit the data and met the standards of a good fit. The results of the model fit analysis showed that all indicators were valid and reliable, with a high p-value, low RMSEA, and high GFI and AGFI, indicating an excellent model. This means that the model can be used to evaluate the relationship between relevant variables. The good validity and reliability of the indicators, together with the strong model fit, support an accurate understanding of the factors that affect entrepreneurial growth. With these data, the analysis of the contribution of digitalization and innovation to entrepreneurship was conducted using a well-fitting and reliable model.

4.2 Discussion

4.2.1 The Impact of Digitalization on Entrepreneur Innovation

The results show that all indicators ($X_{1.1}$, $X_{1.2}$, $X_{1.3}$, *and* $X_{1.4}$) are valid, based on their p-values. $X_{1.2}$ is also reliable, although the reliability data for other indicators are incomplete. $X_{1.1}$ has a good GFI, but GFI values are missing for the other indicators. Valid and reliable measurement tools are crucial for assessing how digitalization and innovation drive entrepreneurial growth. Accurate tools help identify the factors that impact business development in the digital age. Digitalization has democratized innovation by reducing entry barriers. Technologies such as cloud computing have made advanced computing resources accessible at lower costs, allowing startups to rival established companies. This shift has spurred an increase in entrepreneurial activity, especially in technology-driven industries.

The rise of digital technologies has also generated vast amounts of data, offering entrepreneurs valuable insights into market trends, consumer behavior and operational efficiencies. Big data analytics and machine learning now play crucial roles, helping entrepreneurs pinpoint their needs, refine products and services, and make better decisions. This data-centric approach has accelerated innovation and enhanced the accuracy with which market opportunities are targeted. Digitalization democratizes entrepreneurs' access to information and resources. The Internet provides entrepreneurs with extensive knowledge, market data, and networking possibilities, enabling them to make well-informed decisions and identify new innovation opportunities (Berger, Briel, Davidsson, & Kuckertz, 2021). In many industries, digitalization reduces the barriers to entrepreneurial entry.

Cloud computing, Software as a Service (SaaS) platforms, and open-source software have made it more economical for entrepreneurs to create and introduce new products and services, cultivating a culture of innovation and entrepreneurship (Ivanović-Đukić, Stevanović, & Rađenović, 2019). Digital tools and technologies enable entrepreneurs to prototype and refine their ideas quickly. For instance, 3D printing, virtual reality simulations, and Computer-Aided Design (CAD) software enable entrepreneurs to swiftly materialize their concepts, test them with users, and enhance them based on feedback, hastening the innovation process. Additionally, digitalization has broadened entrepreneurs' reach and market access (Avelar, Borges-Tiago, Almeida, & Tiago, 2024). Through e-commerce platforms, social media, and digital marketing channels, entrepreneurs can connect with customers worldwide, surpassing traditional geographical limitations and accessing new markets for innovative offerings.

Digitalization empowers entrepreneurs to use data analytics for informed decision making. By gathering and analyzing data on customer behavior, market trends, and competitor activities, entrepreneurs can recognize patterns, reveal insights, validate hypotheses, guide their innovation efforts, and enhance their chances of success (Dabbous, Barakat, & Kraus, 2023). Moreover, digitalization enables the establishment of collaborative innovation ecosystems. Online platforms, incubators, accelerators, and crowdfunding websites connect entrepreneurs with mentors, investors, and other stakeholders, promoting collaboration, knowledge exchange, and co-creation of innovative solutions to complex challenges (Fossen & Sorgner, 2021). Digitalization has also disrupted traditional industries and business models, creating opportunities for entrepreneurial innovation (Rosin, Proksch, Stubner, & Pinkwart, 2020). Startups that leverage emerging technologies, such as artificial intelligence, blockchain, and Internet of Things (IoT), challenge established players and propel innovation across various sectors, including finance, healthcare, transportation, and education (Kraus, Roig-Tierno, & Bouncken, 2019). In summary, digitalization has dramatically transformed the innovation landscape for entrepreneurs by offering new tools, platforms, and methods that accelerate the pace of innovation and create new opportunities. However, this has also raised additional complexities and ethical concerns. Looking ahead, the most successful entrepreneurs will probably be those who can effectively leverage digital technologies while managing the accompanying challenges in a responsible and ethical manner.

4.2.2 The Impact of Digitalization on Entrepreneur Growth

The findings show that all indicators ($X_{2.1}$ to $X_{2.5}$) are valid, based on their p-values. $X_{2.1}$ has good validity with a GFI of 0.807, though reliability information is missing. $X_{2.2}$ is also valid, reliable, and unidimensional, but its GFI was not provided. Indicators $X_{2.3}$, $X_{2.4}$, and $X_{2.5}$ were valid, but their reliability and GFI have not been reported. The validity of these indicators suggests that the data were

reliable. Specifically, $X_{2.1}$'s good GFI supports a strong analysis, and the validity of $X_{2.2}$ enables an effective evaluation of the link between innovation and entrepreneurial growth. Reliable measurement tools highlight how innovation positively affects the development and expansion of businesses. Digital platforms have transformed the way entrepreneurs secure funding for expansion. Crowdfunding, peer-to-peer lending, and digital investment platforms have facilitated entrepreneurs' access to global investor bases. Moreover, digital systems provide transparency and real-time updates, simplifying the process of attracting venture capital and negotiating better conditions. Automation through digital tools, such as customer service chatbots and AI-driven supply chain management, allows businesses to grow without a corresponding increase in operational costs, thereby enhancing scalability and profitability. Additionally, cloud-based ERP systems have made advanced management tools available to small and medium-sized enterprises to support their growth.

Digitalization enables entrepreneurs to expand their businesses rapidly and access global markets with ease. Through online platforms, e-commerce sites, and digital marketing channels, entrepreneurs can showcase their offerings to a vast audience, overcoming geographical and traditional physical store limitations (Tóth-Pajor, Bedő, & Csapi, 2023). Digitalization provides cost-effective solutions for entrepreneurs to expand their ventures. Cloud computing services, Software as a Service (SaaS) platforms, and digital advertising tools allow entrepreneurs to access advanced technology and marketing capabilities without significant initial investments, reducing barriers to growth and enabling efficient resource allocation (D. Song & Wu, 2020). Additionally, digitalization equips entrepreneurs with valuable data insights that inform strategic decision-making and drive growth. By utilizing analytics tools, entrepreneurs can collect real-time data on customer preferences, market trends, and competitor performance, enabling them to tailor their products, services, and marketing strategies to meet evolving demands and stay competitive (Panshin, Solovieva, Kornilova, & Eronin, 2021).

Digitalization enables entrepreneurs to engage with customers on a deeper, more personalized level, fostering loyalty and encouraging repeat business (Lee, Falahat, & Sia, 2019). Using social media, email marketing, and Customer Relationship Management (CRM) systems, entrepreneurs can build meaningful connections with their audiences, gather feedback, and provide tailored experiences that improve customer satisfaction and retention (Panshin et al., 2021). Digitalization also promotes a culture of innovation and adaptability in entrepreneurial ventures. By leveraging emerging technologies, online collaboration tools, and agile methodologies, entrepreneurs can experiment, iterate, and adjust their business models and strategies to meet changing market conditions, customer preferences, and technological advancements, thereby promoting continuous growth and evolution (Ungureanu, 2021). Furthermore, digitalization has made funding and investment opportunities more accessible to entrepreneurs (Sahut, Iandoli, & Teulon, 2021). Through crowdfunding platforms, online marketplaces, and digital investor networks, entrepreneurs can connect with a diverse range of investors, including venture capitalists, angel investors, and crowdfunding backers, facilitating capital infusion and supporting growth-focused initiatives (Kreiterling, 2023). In conclusion, digitalization has significantly changed the growth opportunities for entrepreneurs. It offers tools and platforms that facilitate rapid scaling, global expansion, and data-driven decision-making. However, it also brings new challenges related to managing digital infrastructure, complying with regulations, and ensuring sustainable growth. Entrepreneurs who thrive in the digital era are those who can effectively use these digital tools while tackling the distinct challenges they present.

4.2.3 The Impact of Innovation on Entrepreneur Growth

The results indicate that all indicators ($Y_{1.1}$, $Y_{1.2}$, *and* $Y_{1.3}$) are valid according to their p-values. $Y_{1.1}$ has good validity with a GFI of 0.742; however, its reliability was not mentioned. $Y_{1.2}$ is valid, reliable, and unidimensional, although its Goodness-of-Fit (GFI) is missing. $Y_{1.3}$ is valid with a p-value of 0.501, but lacks information on reliability and GFI. Overall, $Y_{1.1}$ and $Y_{1.2}$ are especially strong in terms of validity and reliability, aiding the accurate analysis of the factors influencing entrepreneurial growth. These valid indicators help us understand how different elements impact business development and highlight areas that require further attention to boost entrepreneurial growth. Innovation enables entrepreneurs to distinguish their products or services from competitors and gain market share (Roberts, Murray, & Kim, 2019). By introducing unique features, functionalities, or value propositions, entrepreneurs can attract

customers, command premium prices and establish distinct brand identities that support growth and customer loyalty.

Innovation also allows entrepreneurs to explore new markets, segments, or industries and expand their customer base and revenue streams (M. A. Al-Qudah, 2018). Through product line extensions, market diversification strategies, and strategic partnerships, entrepreneurs can use innovation to enter new markets, reduce risk, and achieve sustainable growth. Innovation also improves operational efficiency and cost-effectiveness, helping entrepreneurs maximize profitability and reinvest savings in growth initiatives (Mueller, 2007). By implementing process improvements, automation technologies, or supply chain optimization, entrepreneurs can streamline workflows, reduce costs, and achieve economies of scale that support expansion and competitiveness (Gerguri & Ramadani, 2010). Innovation nurtures a culture of agility and adaptability within entrepreneurial ventures, enabling rapid responses to changing market conditions, customer preferences and technological advancements. Entrepreneurs who embrace innovation are better prepared to adjust their strategies, refine their products or services, and seize emerging opportunities, driving sustainable growth and resilience in uncertain environments (Farinha, Ferreira, & Nunes, 2018).

Innovation empowers entrepreneurs to create solutions that cater to customers' needs, challenges, and aspirations, fostering loyalty and advocacy. By seeking feedback, conducting market research, and using new technologies, entrepreneurs can collaborate with customers to deliver personalized experiences and build long-lasting relationships. This approach drives organic growth and word-of-mouth referral. Innovation also boosts brand reputation and establishes thought leadership, positioning entrepreneurs as pioneers and trusted advisors in their industries (Galindo & Méndez, 2014). Through the consistent delivery of innovative solutions and insightful content, entrepreneurs can build credibility, authority, and influence, attracting new customers, partners, and talent to accelerate growth and market penetration (Kreiterling, 2023). Furthermore, innovation provides a sustainable competitive advantage and instigates disruptive changes within industries, positioning the entrepreneur for long-term success and industry leadership. Entrepreneurs who continuously innovate are better equipped to outperform competitors, predict market trends, and shape industry dynamics, creating barriers to entry and securing market share for sustained growth and profitability (Monte, Moccia, & Pennacchio, 2022). Innovation also promotes collaboration and ecosystem development, enabling entrepreneurs to leverage complementary expertise, resources and networks that drive growth and innovation. By collaborating with startups, corporations, academia, or government agencies, entrepreneurs can access new markets, technologies, and funding sources, fostering mutually beneficial relationships that drive exponential growth and value creation (Juliana, Hui, Clement, Solomon, & Elvis, 2021).

5. Conclusions

5.1 Conclusion

In summary, the Society 5.0 era presents a dynamic environment for entrepreneurship, offering opportunities and challenges owing to rapid digitalization. Entrepreneurs must navigate the evolving digital landscape to drive innovation, growth, and value creation by leveraging digital tools to address problems and meet the changing consumer needs. Digitalization supports entrepreneurial ventures by providing access to global markets, enabling rapid prototyping, and facilitating collaborations. However, it also brings challenges, such as cybersecurity threats, data privacy concerns, and the need to continually adapt to new technologies. To succeed, entrepreneurs must be creative, resilient, and adaptable while embracing innovation, ethical practices, social responsibility, and sustainability to ensure a positive impact on society and the environment. For entrepreneurship to thrive in Society 5.0, employers should invest in digital technologies, encourage innovation, provide ongoing digital skills training, and support flexible work models. They should also collaborate with startups, adopt ethical AI practices, and integrate sustainability into their business strategies. Policymakers must create adaptable regulations, invest in digital infrastructure, enhance digital literacy, support key technologies, foster innovation, and ensure strong data privacy protection. Educators should update curricula to include digital skills, entrepreneurship, practical learning, digital ethics, and lifelong education. Implementing these strategies will create a strong environment for entrepreneurial growth in the digital era.

5.2 Research Limitations

One limitation of this study is its reliance on self-reported data, which may have created a response bias. Focusing on a specific region and sector may also limit the generalizability of the findings. In addition, emphasizing innovation and growth may overlook the social and environmental aspects of entrepreneurship. Future research should use more diverse samples, longitudinal data, and cross-sector or cross-cultural comparisons.

5.3 Suggestions and Direction for Future Research

Entrepreneurs should embrace digital technologies like AI, blockchain, and IoT to drive innovation. Organizations must foster creativity, continuous learning, and adaptability through training. Prioritizing customer experience, cybersecurity, data privacy, and integrating sustainability, social responsibility, and diversity are essential for business growth and market responsiveness.

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Author Contributions

JMP conceptualized the study, designed the methodology, analyzed the data, and drafted the manuscript. DRK contributed to the methodology and interpretation of the results. AG and RT assisted with data collection and analysis. AS and SS contributed to the manuscript review and editing. AS assisted with the final revision and proofreading. All the authors approved the final manuscript.

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