International Journal of Environmental Sciences
ISSN: 2229-7359
Vol. 11 No. 17s, 2025
https://theaspd.com/index.php

Unveiling The Drivers Of Entrepreneurial Intention In The Metaverse

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***Abstract*—** The metaverse represents a transformative digital ecosystem that integrates augmented reality (AR), virtual reality (VR), and blockchain technologies to create immersive virtual environments (Dwivedi et al., 2022; Gupta et al., 2023). Despite its potential to revolutionize digital entrepreneurship, limited research has investigated the specific factors driving entrepreneurial intention in this emerging space, particularly the interplay of individual competencies, cognitive traits, and social dynamics. This study addresses this gap by examining the role of digital competencies, entrepreneurial self-efficacy (ESE), and individual entrepreneurial orientation (IEO) in fostering entrepreneurial behavior, with a focus on the mediating effects of social influence and innovation perception. The study draws on survey data from 300 aspiring entrepreneurs engaged in metaverse-related activities, providing insights into this unique and underexplored population. Building on recent theoretical advancements and empirical findings, this study explores the critical roles of digital competencies, entrepreneurial self-efficacy (ESE), and individual entrepreneurial orientation (IEO) as independent predictors of entrepreneurial intention in the metaverse. Digital competencies directly enhance entrepreneurial intention by equipping entrepreneurs with the technical expertise to navigate complex virtual ecosystems and innovate effectively (Hastuti et al., 2023; Sundararajan et al., 2024). ESE, reflecting confidence in one's entrepreneurial capabilities, directly drives entrepreneurial intention and indirectly influences it through social influence. The latter, shaped by peer recognition, professional networks, and community engagement, acts as a significant mediator, underscoring the importance of external validation in fostering entrepreneurial behavior (Dwivedi et al., 2022). Similarly, IEO, which encompasses traits such as proactiveness, risk-taking, and innovativeness, directly impacts entrepreneurial intention and indirectly enhances it through innovation perception. Innovation perception, defined as the ability to recognize and capitalize on creative opportunities, highlights the importance of adaptability and forward-thinking in leveraging the dynamic potential of the metaverse economy (Gupta et al., 2023). The findings of this study contribute to the emerging literature on metaverse entrepreneurship by addressing the research gap in understanding the behavioral and cognitive drivers of entrepreneurial intention in virtual environments. Furthermore, these insights provide actionable recommendations for educators, policymakers, and industry leaders. By fostering digital competencies and promoting innovation-oriented frameworks, stakeholders can unlock the potential of the metaverse as a dynamic entrepreneurial platform. Future research should explore regional and industry-specific variations in entrepreneurial intention, as well as the long-term implications of metaverse-enabled business models.

***Keywords*—** Digital Competencies, Entrepreneurial Intention, Metaverse, Innovation Perception, Social Influence, Virtual Entrepreneurship

I. INTRODUCTION

The metaverse is a rapidly evolving digital ecosystem that integrates augmented reality (AR), virtual reality (VR), blockchain, and artificial intelligence (AI) to create immersive virtual environments. Defined by its interconnectedness, persistence, and user-generated content, the metaverse blurs the boundaries between the physical and virtual worlds. This convergence has catalyzed new opportunities across various sectors, including entertainment, education, healthcare, and, most notably, entrepreneurship. By enabling users to create, interact, and transact in virtual spaces, the metaverse offers unprecedented potential for innovation and business growth (Dwivedi et al., 2022; Gupta et al., 2023).

As an extension of the internet, the metaverse's decentralized nature empowers individuals and businesses to engage in global digital commerce. It facilitates real-time collaboration, resource sharing, and the establishment of virtual economies. These economies are fueled by digital assets such as non-fungible tokens (NFTs), cryptocurrencies, and tokenized services, creating a fertile ground for entrepreneurial activity. However, as this ecosystem evolves, it introduces unique challenges and complexities, including technological barriers, ethical considerations, and the need for new competencies.

The transformative potential of the metaverse makes it a critical area of study. With its ability to redefine how businesses operate and interact, understanding its dynamics is essential for fostering sustainable entrepreneurship in this emerging space. While much attention has been given to the technological infrastructure of the metaverse, limited research has explored the behavioral and cognitive drivers of entrepreneurial intention within this context. This study seeks to fill this gap by examining how digital competencies, entrepreneurial self-efficacy (ESE), and individual entrepreneurial orientation (IEO) influence entrepreneurial behavior in the metaverse. Entrepreneurial intention is the precursor to entrepreneurial behavior and is influenced by an interplay of cognitive, social, and environmental factors. In the metaverse, these factors are further shaped by the immersive and dynamic nature of virtual environments. Understanding entrepreneurial intention in this context is vital for several reasons. The metaverse has the potential to drive significant economic growth by fostering innovation and creating new markets. Entrepreneurs play a pivotal role in this growth by identifying opportunities, developing solutions, and driving adoption. Operating in the metaverse requires unique skills, such as digital literacy, technological adaptability, and innovation perception. Exploring entrepreneurial intention helps identify the competencies necessary for success in this space. Insights into entrepreneurial intention can inform policies that support digital entrepreneurship, particularly in areas such as education, infrastructure development, and access to capital. The study of entrepreneurial intention can address disparities in access and participation within the metaverse, ensuring that its benefits are equitably distributed across diverse populations. By focusing on entrepreneurial intention, this research contributes to a deeper understanding of how individuals navigate the opportunities and challenges of the metaverse, paving the way for informed decision-making by educators, policymakers, and industry leaders.

II. Research Problem and gaps

Despite the growing prominence of the metaverse as a transformative digital ecosystem, research on its entrepreneurial dimensions remains limited. Most existing studies focus on technological advancements and economic implications, often neglecting the human and behavioral aspects that drive entrepreneurial activity. Entrepreneurs in the metaverse face unique challenges and opportunities, yet the specific factors influencing their intentions and behaviors remain underexplored. While digital literacy is widely recognized as a foundational skill for metaverse engagement, the nuances of digital competencies in this context require deeper investigation. Specific skills, such as programming, blockchain expertise, and digital marketing, are essential for creating and sustaining ventures in virtual environments. For example, blockchain expertise is critical for managing decentralized finance systems, secure transactions, and NFT-based asset creation (Dwivedi et al., 2022; Hastuti et al., 2023). Similarly, digital marketing skills enable entrepreneurs to reach target audiences within immersive platforms, using tools like AR and VR to enhance customer engagement (Gupta et al., 2023). However, little is known about how these competencies directly influence entrepreneurial intention. Existing frameworks fail to address how the interplay of technical proficiency and creativity enables entrepreneurs to identify and exploit opportunities in the metaverse. Without a clear understanding of these dynamics, entrepreneurs may struggle to adapt to the metaverse's rapidly changing technological landscape (Mystakidis, 2022).

Entrepreneurial self-efficacy (ESE) is a critical predictor of entrepreneurial intention, reflecting an individual's confidence in their ability to perform entrepreneurial tasks. However, the application of ESE in virtual environments like the metaverse remains underexplored. Unlike traditional physical settings, the metaverse is characterized by unique social and technological dynamics, including anonymity, virtual collaboration, and rapid technological evolution (Sundararajan et al., 2024). Bandura's Social Cognitive Theory emphasizes the importance of self-efficacy in shaping behavior, but the extent to which ESE translates into entrepreneurial intention in the metaverse is unclear (Bandura, 1986). For instance,

entrepreneurs operating in virtual spaces may gain confidence through simulated business scenarios or community-based learning platforms, yet the mechanisms linking these experiences to entrepreneurial intention have not been thoroughly examined. Additionally, the role of perceived usefulness and ease of use, as outlined in the Technology Acceptance Model (TAM), highlights another unexplored avenue. Understanding how these factors interact with ESE in the metaverse context could provide valuable insights for fostering entrepreneurial success (Venkatesh & Davis, 2000).

The metaverse's community-driven nature underscores the importance of social validation, peer recognition, and professional networks in shaping entrepreneurial intention. Entrepreneurs often rely on virtual communities for mentorship, collaboration, and market insights. For example, virtual networking events and decentralized social platforms provide opportunities for knowledge exchange and partnership formation (Huang & Chen, 2020; Wang & Xu, 2023). However, the mediating effects of social influence on entrepreneurial intention remain insufficiently studied. While some research highlights the motivational impact of peer validation, little attention has been paid to how social networks facilitate the acquisition of resources and competencies necessary for success in the metaverse (Firmansyah & Kurniati, 2022). Furthermore, cultural and regional differences in how entrepreneurs interact within virtual communities add another layer of complexity that warrants exploration. Innovation perception, which encompasses an individual's ability to identify and capitalize on opportunities, is a key driver of entrepreneurial intention in the metaverse. Entrepreneurs who view the metaverse as a fertile ground for innovation are more likely to engage in creative problem-solving and experimentation (Hastuti et al., 2023; Laeeq, 2021). However, the dynamic and unpredictable nature of the metaverse presents significant challenges. Entrepreneurs must constantly adapt their strategies to align with emerging trends, such as the integration of AI-driven virtual assistants or the rise of decentralized autonomous organizations (DAOs). Despite its importance, the mediating role of innovation perception in the relationship between entrepreneurial traits and intention remains underexplored. Understanding how adaptability and resilience influence entrepreneurial outcomes in the metaverse is critical for developing strategies that foster long-term success (Dwivedi et al., 2022; Gupta et al., 2023).

This study addresses these gaps by examining the interplay between digital competencies, ESE, IEO, social influence, and innovation perception, providing a comprehensive understanding of the drivers of entrepreneurial intention in the metaverse.

III. Research objectives and questions

This section outlines the specific ocjectives that guide this research. The objectives define what the study aims to achieve.

RO1: To investigate the impact of digital competencies on entrepreneurial intention in the metaverse.
RO2: To examine the role of entrepreneurial self-efficacy in fostering entrepreneurial intention.
RO3: To explore the influence of individual entrepreneurial orientation on entrepreneurial intention.
RO4: To assess the mediating effects of social influence and innovation perception on entrepreneurial intention.

While the questions translate these aims into testable propositions, providing a clear framework for the investigation into entrepreneurial intention within the metaverse context.

RQ1: How do digital competencies influence entrepreneurial intention in the metaverse?
RQ2: What role does entrepreneurial self-efficacy play in shaping entrepreneurial intention?
RQ3: How does individual entrepreneurial orientation impact entrepreneurial intention?
RQ4: To what extent do social influence and innovation perception mediate the relationship between individual
traits and entrepreneurial intention?

IV. Scope and Significance of Study

This study focuses on aspiring entrepreneurs engaged in metaverse-related activities, including virtual content creation, NFT trading, and virtual event management. By leveraging survey data from a diverse population of 300 participants, the research provides insights into the behavioral and cognitive drivers of entrepreneurial intention within this unique context.

The significance of this study lies in its multidimensional approach, which bridges theoretical constructs and practical applications to create a comprehensive understanding of entrepreneurial intention in the metaverse. By integrating constructs such as entrepreneurial self-efficacy (ESE), individual entrepreneurial orientation (IEO), and innovation perception, the research addresses critical gaps in the current literature and provides actionable insights for various stakeholders, including educators, policymakers, and industry leaders. For educators, the findings of this study are instrumental in developing curricula that emphasize the digital competencies and entrepreneurial skills required for success in the metaverse. As the digital economy evolves, traditional educational frameworks often fall short of preparing students for the complexities of virtual environments. This study highlights the need for an updated curriculum that integrates hands-on training in blockchain technologies, digital marketing, and virtual reality (VR) applications. By equipping students with these skills, educational institutions can better prepare the next generation of entrepreneurs to identify and exploit opportunities in the metaverse. Moreover, the study underscores the importance of fostering an entrepreneurial mindset among students. This includes not only teaching technical skills but also cultivating traits such as adaptability, resilience, and innovation perception. By incorporating case studies, simulations, and project-based learning focused on metaverse entrepreneurship, educators can create immersive learning experiences that mirror real-world challenges and opportunities. The findings also offer valuable insights for policymakers tasked with crafting policies that support digital entrepreneurship. The metaverse, as a rapidly emerging digital ecosystem, presents unique opportunities for economic growth and innovation. However, barriers to entry, such as limited access to resources, digital literacy gaps, and regulatory uncertainties, can hinder participation, particularly for underrepresented groups. This study provides a foundation for addressing these challenges by identifying the key drivers of entrepreneurial intention. Policymakers can use these insights to design targeted interventions, such as funding programs for metaverse startups, initiatives to improve digital infrastructure, and educational campaigns to promote digital literacy. Furthermore, the study emphasizes the importance of equitable access to metaverse opportunities, ensuring that benefits are distributed across diverse populations. This includes creating policies that encourage diversity and inclusion within virtual environments, fostering a more representative and innovative entrepreneurial ecosystem.

For industry leaders, the study provides guidance on developing programs and platforms that nurture innovation and entrepreneurial activity within virtual environments. Companies operating in the metaverse are uniquely positioned to shape its development by providing tools, resources, and mentorship for aspiring entrepreneurs. The study highlights the need for industry-driven initiatives, such as accelerator programs, hackathons, and virtual networking events, that encourage experimentation and collaboration. Additionally, the study underscores the value of partnerships between industry and academia. By working together, companies and educational institutions can create synergies that accelerate the development of metaverse entrepreneurship. For example, collaborations on research projects, internships, and real-world case studies can provide students with practical experience while addressing industry needs.

V. Literature Review

A. Digital Competencies: Theoretical Underpinnings and Their Role in the Metaverse

Digital competencies are foundational for entrepreneurs to effectively navigate the metaverse. These competencies integrate AR, VR, blockchain, and social media principles, forming the technological bedrock of the metaverse. Immersive interactions, such as virtual trade fairs or blockchain-enabled financial systems, require entrepreneurs to possess advanced digital literacy, enhancing their capability to innovate and create value (Dwivedi et al., 2022; Gupta et al., 2023). Hastuti et al. (2023) emphasize that digital literacy extends beyond basic technological know-how. Entrepreneurs must understand virtual economies, manage digital assets such as NFTs, and leverage blockchain technologies for decentralized finance. This expertise facilitates not only operational efficiency but also fosters a competitive advantage in the rapidly evolving digital landscape. For instance, small and medium enterprises (SMEs) that adopt metaverse technologies often find themselves positioned to access new markets and expand their customer base globally.

Further, digital competencies enable entrepreneurs to design immersive experiences that enhance customer engagement. For example, using AR and VR, businesses can create virtual showrooms or interactive product demonstrations, providing potential customers with unique purchasing experiences (Mystakidis, 2022). As digital ecosystems evolve, these competencies will become increasingly crucial, particularly as the metaverse grows to include more sophisticated AI-driven interactions.

B. Entrepreneurial Self-Efficacy (ESE): Conceptual Framework and Influence on Entrepreneurial Behaviors Entrepreneurial self-efficacy (ESE) is a pivotal factor influencing entrepreneurial behaviors within the metaverse. According to Bandura's Social Cognitive Theory, ESE determines individuals' confidence in their ability to perform entrepreneurial tasks, such as identifying opportunities, mobilizing resources, and managing risks (Bandura, 1986). This confidence is essential for navigating the complexities of the metaverse, where technologies and business models are constantly evolving. Sundararajan et al. (2024) argue that the immersive nature of the metaverse amplifies these dynamics by enabling entrepreneurs to experiment and develop skills in low-risk virtual settings. Entrepreneurs can simulate business scenarios, test product ideas, or practice customer engagement strategies in a controlled virtual environment, thereby enhancing their self-efficacy.

Moreover, the Technology Acceptance Model (TAM) posits that perceived usefulness and ease of use are key to increasing ESE. Entrepreneurs who find metaverse tools intuitive and beneficial for their goals are more likely to adopt and leverage them effectively. For instance, user-friendly platforms like Decentraland or The Sandbox provide entrepreneurs with accessible tools for setting up virtual storefronts or managing digital assets, which in turn builds their confidence and encourages further exploration (Venkatesh & Davis, 2000). ESE also plays a critical role in fostering adaptability. Entrepreneurs with high ESE are more likely to embrace change, a necessary trait for succeeding in the dynamic and unpredictable environment of the metaverse. This adaptability, coupled with their confidence, allows them to identify and capitalize on emerging opportunities (Mystakidis, 2022).

C. Individual Entrepreneurial Orientation (IEO): Dimensions of Proactiveness, Risk-Taking, and Innovativeness

Individual entrepreneurial orientation (IEO) is another critical construct for understanding entrepreneurial intention in the metaverse. It encompasses three core dimensions: proactiveness, risk-taking, and innovativeness. These traits are particularly relevant in the metaverse, where the ability to anticipate trends, embrace uncertainty, and develop novel solutions often determines success (Gupta et al., 2023).

Proactiveness involves identifying and acting on emerging opportunities before others. For example, entrepreneurs who recognized the potential of virtual real estate early on have established profitable businesses by acquiring and developing virtual properties. Similarly, risk-taking is evident in the willingness of entrepreneurs to invest in blockchain-based businesses, despite the volatility and unpredictability of cryptocurrencies.

Innovativeness, the third dimension, is central to creating unique value propositions in the metaverse. Hastuti et al. (2023) highlight the innovative strategies employed by entrepreneurs to engage customers, such as using VR to create personalized shopping experiences or leveraging blockchain to offer secure and transparent transactions. Entrepreneurs with high IEO are better positioned to navigate the unique challenges of the metaverse, such as integrating tokenized assets into traditional business models (Dwivedi et al., 2022).

IEO also fosters resilience. Entrepreneurs who embody these traits are more likely to persevere through the challenges of building a business in the metaverse, from technical hurdles to market saturation. Their proactive and innovative approaches enable them to stand out in an increasingly competitive landscape.

D. Social Influence and Professional Networks in Entrepreneurial Intention

Social influence is a significant determinant of entrepreneurial intention, particularly in the metaverse. The collaborative nature of virtual environments fosters a sense of community, where peer validation and professional networks play crucial roles in shaping entrepreneurial behavior (Huang & Chen, 2020).

Successful metaverse entrepreneurs often serve as role models, inspiring others to pursue similar ventures. Virtual platforms such as forums, webinars, and networking events provide spaces for aspiring entrepreneurs to learn from these trailblazers. This visibility enhances credibility and provides aspiring

entrepreneurs with valuable insights into best practices and strategies for success (Firmansyah & Kurniati, 2022).

Professional networks are equally important, offering access to resources such as mentorship, capital, and market opportunities. Wang and Xu (2023) highlight that metaverse entrepreneurs often rely on their networks to overcome challenges, such as understanding complex technologies or navigating regulatory environments. These networks not only provide practical support but also create a sense of belonging and shared purpose, which can motivate individuals to pursue entrepreneurial activities in the metaverse.

Social influence also extends to community-driven initiatives. For instance, virtual incubators and accelerators offer entrepreneurs opportunities to collaborate on projects, share knowledge, and collectively solve problems. This collaborative approach not only strengthens individual businesses but also contributes to the overall growth of the metaverse ecosystem.

E. Innovation Perception: Adaptability and Opportunity Recognition in the Metaverse Economy

Innovation perception is a key driver of entrepreneurial success in the metaverse, as it fosters adaptability and opportunity recognition. Entrepreneurs who perceive the metaverse as a platform for creativity and experimentation are more likely to engage with it and develop innovative business models (Hastuti et al., 2023; Laeeq, 2021).

Tools like NFTs and decentralized platforms have created new avenues for value generation, allowing entrepreneurs to market unique virtual products or services. For example, artists and designers have used NFTs to monetize their digital creations, while businesses have used decentralized platforms to offer exclusive content or experiences. These innovations not only generate revenue but also enhance customer engagement and loyalty (Dwivedi et al., 2022).

Adaptability is another core aspect of innovation perception. Entrepreneurs must be willing to pivot strategies based on feedback from virtual communities or changes in market trends. Dwivedi et al. (2022) argue that this flexibility is essential for navigating the dynamic nature of the metaverse, which is characterized by rapid technological advancements and shifting consumer preferences.

Innovation perception also encourages long-term thinking. Entrepreneurs who view the metaverse as a space for sustained growth and experimentation are more likely to invest in its potential, whether through research and development, partnerships, or continuous learning. This forward-looking perspective ensures that they remain competitive in an increasingly crowded marketplace (Gupta et al., 2023).

F. Synthesis of Existing Research and Identification of Gaps

Despite the growing body of research on the metaverse, significant gaps remain. For instance, regional and cultural variations in metaverse adoption have received little attention. Understanding these differences is crucial for developing tailored strategies that address the unique needs and challenges of diverse entrepreneurial ecosystems (Sundararajan et al., 2024).

Another gap lies in the mediating role of ESE and IEO in driving entrepreneurial intention. While existing studies have explored these constructs independently, their interplay within the context of the metaverse remains underexplored. Mystakidis (2022) highlights the need for a more nuanced understanding of how these factors interact to influence entrepreneurial behavior.

Finally, the long-term implications of digital competencies for metaverse entrepreneurship warrant further investigation. As technologies evolve, so too will the skills and knowledge required to succeed in the metaverse. Research that anticipates these changes will be critical for preparing the next generation of entrepreneurs (Dwivedi et al., 2022).

By addressing these gaps, this study contributes to a deeper understanding of the behavioral and cognitive drivers of entrepreneurial intention in the metaverse. It advances both academic inquiry and practical applications, providing a roadmap for fostering innovation and entrepreneurship in this emerging digital ecosystem.

G. Conceptual Framework

The conceptual framework for this study integrates key constructs from entrepreneurial research and digital technology adoption theories to explore the drivers of entrepreneurial intention in the metaverse. This framework draws on Social Cognitive Theory (SCT), the Technology Acceptance Model (TAM), and the Entrepreneurial Event Model (EEM) to examine the relationships between individual traits, social dynamics, and innovation perception in shaping entrepreneurial behaviors within virtual environments.

H. Key Constructs

Digital Competencies are foundational skills required to navigate and operate within the metaverse, including blockchain expertise, virtual reality (VR) proficiency, and digital marketing skills. Digital competencies enable entrepreneurs to identify and capitalize on opportunities in virtual ecosystems. Entrepreneurial Self-Efficacy (ESE) reflects an individual's confidence in their ability to execute entrepreneurial tasks, such as opportunity recognition, resource mobilization, and risk management. In the metaverse, ESE is influenced by perceived ease of use and the utility of virtual tools. Individual Entrepreneurial Orientation (IEO) encompasses traits such as proactiveness, risk-taking, and innovativeness. These dimensions are critical for entrepreneurs to anticipate trends, embrace uncertainty, and create novel solutions in the dynamic metaverse environment. Social Influence plays the role of peer validation, mentorship, and professional networks in entrepreneurial intention. Social influence shapes access to resources and provides motivation for individuals to pursue entrepreneurial activities. Innovation Perception refers to an individual's ability to identify and evaluate creative opportunities within the metaverse. It includes adaptability, a critical trait for navigating the rapidly evolving digital landscape.

Social Influence and Innovation Perception mediate the relationships between individual traits (ESE, IEO, and digital competencies) and entrepreneurial intention. Social influence facilitates resource access and motivation, while innovation perception drives adaptability and opportunity recognition.

I. Hypotheses

Based on the conceptual framework, the study proposes the following hypotheses:

H1: Digital competencies positively influence entrepreneurial intention in the metaverse.

H2: Digital competencies positively influence innovation perception in the metaverse.

H3: Entrepreneurial self-efficacy positively influences entrepreneurial intention in the metaverse.

H4: Entrepreneurial self-efficacy positively influences social influence in the metaverse.

H5: Individual entrepreneurial orientation positively influences entrepreneurial intention in the metaverse.

H6: Individual entrepreneurial orientation positively influences innovation perception in the metaverse.

H7: Social influence mediates the relationship between entrepreneurial self-efficacy and entrepreneurial intention.

H8: Innovation perception mediates the relationship between digital competencies and entrepreneurial intention.

H9: Innovation perception mediates the relationship between individual entrepreneurial orientation and entrepreneurial intention.

VI. METHODOLOGY

A. Research Design

This study employs a quantitative research approach to investigate the factors influencing entrepreneurial intention in the metaverse. By testing hypotheses derived from established theories such as Social Cognitive Theory (Bandura, 1986), the Technology Acceptance Model (Venkatesh & Davis, 2000), and the Entrepreneurial Event Model (Shapero & Sokol, 1982), the research seeks to provide empirical evidence on the relationships between digital competencies, entrepreneurial self-efficacy (ESE), individual entrepreneurial orientation (IEO), social influence, and innovation perception. A cross-sectional survey design was adopted, allowing for the collection of data at a single point in time to assess the interplay of these constructs. This design is particularly suitable for hypothesis testing and aligns with the deductive approach of the study (Creswell & Creswell, 2017).

B. Sampling and Target Population

The target population comprises entrepreneurs and aspiring entrepreneurs actively engaged in the metaverse, including those involved in virtual content creation, NFT trading, and immersive event management. Participants were required to meet specific criteria, including active engagement with metaverse platforms (e.g., Decentraland or The Sandbox), involvement in entrepreneurial activities such as digital asset creation or blockchain-based ventures, and a basic understanding of digital technologies.

A purposive sampling method was employed to ensure the inclusion of individuals with relevant experience. The sample size was determined using G*Power 3.1, a statistical tool for power analysis (Faul et al., 2007). Based on an anticipated medium effect size ($f^2 = 0.15$), a power level of 0.80, and a significance level of $\alpha = 0.05$, the minimum required sample size for a model with five predictors was calculated to be 92. To ensure robustness and account for potential non-responses, the sample size was increased to 300 participants. This larger sample not only enhances the generalizability of the findings but also ensures sufficient statistical power for the use of Partial Least Squares Structural Equation Modeling (PLS-SEM) (Hair et al., 2021).

C. Data Collection

Data were collected using a structured questionnaire designed to measure the key constructs of the conceptual framework. The instrument included validated scales adapted from previous research. Digital competencies were assessed using items derived from the Digital Competence Framework for Entrepreneurs (DigComp 2.0) (Carretero et al., 2017), capturing blockchain expertise, AR/VR proficiency, and digital marketing skills. Entrepreneurial self-efficacy was measured using a scale developed by Zhao et al. (2005), while individual entrepreneurial orientation (IEO) was assessed using Covin and Slevin's (1989) scale, which examines proactiveness, risk-taking, and innovativeness. Social influence was measured using items adapted from Venkatesh and Davis (2000), focusing on peer validation and professional networks, and innovation perception was measured using a framework by Laeeq (2021) to assess adaptability and opportunity recognition. Entrepreneurial intention was captured using scales tailored to metaverse contexts (Krueger et al., 2000). All items were rated on a five-point Likert scale ranging from 1 (Strongly Disagree) to 7 (Strongly Agree). The questionnaire was pre-tested with a pilot sample of 30 participants to ensure clarity, reliability, and validity.

The survey was distributed online using platforms Qualtrics and Google Forms, targeting communities active in metaverse entrepreneurship. These included Discord servers, Reddit groups, and virtual forums dedicated to blockchain and digital asset creation. Data collection spanned 4 weeks to ensure a diverse and representative sample.

D. Data Analysis

The collected data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM), a robust technique for analyzing complex models with multiple constructs and mediators. The analysis was conducted using SmartPLS 4.0, which offers advanced capabilities for assessing both measurement and structural models (Ringle et al., 2022). Initially, the data were screened for missing values and outliers to ensure quality. Descriptive statistics, including mean, standard deviation, and frequency, were computed to profile the sample. Reliability and validity were assessed through Cronbach's Alpha, Composite Reliability (CR), and Average Variance Extracted (AVE). Discriminant validity was evaluated using the Heterotrait-Monotrait Ratio (HTMT). The structural model was then analyzed to test the hypothesized relationships. Path coefficients were calculated to assess the strength and direction of relationships between constructs, and mediation analyses were conducted to examine the roles of social influence and innovation perception. The model's goodness of fit was evaluated using the standardized root mean square residual (SRMR).

VII. FINDINGS

A. Demographic Profile of Respondents

The demographic analysis revealed a diverse sample of 300 participants actively engaged in the metaverse. The majority of respondents (62%) were between 25 and 34 years old, with a balanced gender distribution (52% male and 48% female). Approximately 70% of participants held at least a bachelor's degree, and 58% had prior entrepreneurial experience. Furthermore, 85% of respondents reported familiarity with metaverse platforms such as Decentraland, The Sandbox, and Roblox, with 42% actively involved in NFT trading or virtual asset management.

B. Measurement Model Assessment

The reliability and validity of the constructs were assessed using PLS-SEM. All constructs demonstrated high internal consistency, with Cronbach's Alpha and Composite Reliability (CR) values exceeding the threshold of 0.7. Convergent validity was established, as Average Variance Extracted (AVE) values for all

constructs were above 0.5. Discriminant validity was confirmed using the Heterotrait-Monotrait Ratio (HTMT), which showed no multicollinearity issues among the constructs.

TABLE I MEASUREMENT MODEL ASSESSMENT

Construct	Cronbach's Alpha	Composite Reliability (CR)	AVE
Digital Competencies	0.85	0.88	0.65
Entrepreneurial Self-Efficacy	0.89	0.91	0.72
Individual Entrepreneurial Orientation	0.87	0.9	0.7
Social Influence	0.84	0.87	0.63
Innovation Perception	0.88	0.91	0.74
Entrepreneurial Intention	0.86	0.89	0.68

C. Structural Model Assessment

The structural model was evaluated to test the hypothesized relationships. Key findings are summarized below:

TABLE IISTRUCTURAL MODEL ASSESSMENT

Hypothesis	Path Coefficient (β)	p-value	Result
H1: Digital competencies positively influence entrepreneurial intention in the metaverse.	0.29	0.01	Supported
H2: Digital competencies positively influence innovation perception in the metaverse.	0.33	0.001	Supported
H3: Entrepreneurial self-efficacy positively influences entrepreneurial intention in the metaverse.	0.36	0.001	Supported
H4: Entrepreneurial self-efficacy positively influences social influence in the metaverse.	0.28	0.01	Supported
H5: Individual entrepreneurial orientation positively influences entrepreneurial intention in the metaverse.	0.31	0.01	Supported
H6: Individual entrepreneurial orientation positively influences innovation perception in the metaverse.	0.34	0.001	Supported
H7: Social influence mediates the relationship between entrepreneurial self-efficacy and entrepreneurial intention.	0.21	0.05	Supported
H8: Innovation perception mediates the relationship between digital competencies and entrepreneurial intention.	0.18	0.05	Supported
H9: Innovation perception mediates the relationship between individual entrepreneurial orientation and entrepreneurial intention.	0.2	0.05	Supported

Digital competencies positively influence both entrepreneurial intention and innovation perception, highlighting the importance of technical skills in the metaverse. Entrepreneurial self-efficacy not only directly influences entrepreneurial intention but also enhances social influence, underscoring the role of confidence in navigating virtual ecosystems. Individual entrepreneurial orientation significantly drives both entrepreneurial intention and innovation perception, emphasizing the importance of proactiveness,

risk-taking, and innovativeness in the metaverse. Social influence and innovation perception serve as critical mediators, amplifying the effects of ESE, digital competencies, and IEO on entrepreneurial intention.

VIII. DISCUSSION

The findings of this study provide valuable insights into the factors influencing entrepreneurial intention in the metaverse, validating the hypothesized relationships between digital competencies, entrepreneurial self-efficacy (ESE), individual entrepreneurial orientation (IEO), social influence, and innovation perception. The results highlight the importance of both individual traits and contextual mediators in shaping entrepreneurial behaviors within this emerging digital ecosystem.

A. Digital Competencies and Entrepreneurial Intention

The study confirms that digital competencies significantly influence entrepreneurial intention, supporting H1. This underscores the critical role of technical skills, such as blockchain expertise and AR/VR proficiency, in enabling entrepreneurs to navigate the metaverse effectively. The positive relationship between digital competencies and innovation perception further emphasizes the value of these skills in fostering creativity and adaptability. These findings align with previous research suggesting that advanced digital literacy equips entrepreneurs with the tools needed to identify and capitalize on opportunities in dynamic virtual environments (Carretero et al., 2017; Dwivedi et al., 2022). For practitioners, this implies a need for targeted training programs to enhance digital competencies among aspiring metaverse entrepreneurs.

B. Entrepreneurial Self-Efficacy (ESE)

Entrepreneurial self-efficacy was found to be a strong predictor of entrepreneurial intention supporting H3. This highlights the importance of confidence in entrepreneurial capabilities, such as opportunity recognition and resource mobilization, in motivating individuals to engage in metaverse-based ventures. Moreover, the positive influence of ESE on social influence validates H4, indicating that confident entrepreneurs are more likely to leverage peer validation and professional networks. These findings are consistent with Bandura's Social Cognitive Theory, which posits that self-efficacy enhances an individual's ability to navigate complex environments (Bandura, 1986). In the metaverse, this is particularly relevant given the technological and social complexities of virtual ecosystems.

C. Individual Entrepreneurial Orientation (IEO)

The study confirms the significant impact of IEO on both entrepreneurial intention and innovation perception, supporting H5 and H6. Entrepreneurs with traits such as proactiveness, risk-taking, and innovativeness are better equipped to identify and act on opportunities in the metaverse. These findings align with prior research that emphasizes the role of entrepreneurial orientation in fostering competitive advantages and driving innovation (Covin & Slevin, 1989; Gupta et al., 2023). For policymakers and educators, this underscores the importance of fostering entrepreneurial mindsets through experiential learning and mentorship programs tailored to the metaverse context.

D. Mediating Effects of Social Influence and Innovation Perception

The mediating roles of social influence and innovation perception were also confirmed. Social influence significantly mediated the relationship between ESE and entrepreneurial intention, supporting H7. This finding highlights the collaborative nature of the metaverse, where professional networks and peer recognition play a critical role in shaping entrepreneurial behaviors. Similarly, innovation perception mediated the relationships between digital competencies and entrepreneurial intention and between IEO and entrepreneurial intention supporting H8 and H9. Entrepreneurs who perceive the metaverse as a platform for creativity and experimentation are more likely to pursue opportunities, reinforcing the importance of fostering innovation-oriented mindsets.

E. Implications for Theory and Practice

From a theoretical perspective, this study significantly contributes to the literature by integrating constructs from Social Cognitive Theory (Bandura, 1986), the Technology Acceptance Model (Venkatesh & Davis, 2000), and the Entrepreneurial Event Model (Shapero & Sokol, 1982) to provide a comprehensive understanding of entrepreneurial intention in the metaverse. These frameworks were validated in the context of virtual ecosystems, confirming their applicability to a novel and rapidly evolving

environment. For example, Social Cognitive Theory's emphasis on self-efficacy is particularly relevant in the metaverse, where confidence in managing digital tools and resources is critical for entrepreneurial success (Bandura, 1986). Similarly, the Technology Acceptance Model demonstrates that perceived usefulness and ease of use of metaverse technologies significantly influence innovation perception and entrepreneurial intention, extending its relevance beyond traditional technology adoption studies (Venkatesh & Davis, 2000).The Entrepreneurial Event Model also gains new significance in the metaverse context by highlighting the role of individual entrepreneurial orientation (IEO) in driving intention through mediating factors such as innovation perception and social influence. Entrepreneurs in the metaverse display heightened proactiveness and innovativeness, traits that align closely with the model's emphasis on the interplay between personal traits and contextual factors (Shapero & Sokol, 1982). These theoretical contributions provide a robust framework for future research on entrepreneurship in digital ecosystems, bridging existing gaps in understanding how individual, social, and technological factors intersect in the metaverse.Practically, the study offers actionable insights for educators, policymakers, and industry leaders. For educators, the findings emphasize the importance of integrating digital competencies and entrepreneurial orientation into curricula to prepare students for the metaverse's challenges and opportunities. Programs that focus on blockchain, virtual reality (VR), and augmented reality (AR) skills can equip students with the technical expertise needed to navigate virtual ecosystems (Carretero et al., 2017). Moreover, incorporating experiential learning methods, such as simulations and virtual internships, can help students develop entrepreneurial self-efficacy (Zhao et al., 2005). Partnerships with metaverse-based businesses can further provide real-world applications, bridging the gap between education and industry.For policymakers, the study highlights the need to design initiatives that lower barriers to entry for aspiring metaverse entrepreneurs. Digital infrastructure improvements, such as expanded access to high-speed internet and affordable digital tools, are crucial for fostering equitable participation (Dwivedi et al., 2022). Funding programs targeting metaverse startups, particularly those led by underrepresented groups, can encourage diversity and inclusivity. Policymakers can also promote professional networks and virtual incubators, which amplify social influence and provide access to mentorship and capital (Huang & Chen, 2020). These efforts can create a supportive ecosystem where entrepreneurs are empowered to innovate and grow their ventures.For industry leaders, the study underscores the importance of fostering collaboration and innovation within the metaverse. Companies operating in this space can establish virtual accelerators, hackathons, and training programs to nurture entrepreneurial talent. Collaborative initiatives with academic institutions can enhance the pipeline of skilled entrepreneurs ready to leverage metaverse technologies (Gupta et al., 2023). Additionally, platforms that prioritize user-friendly interfaces and provide clear guidance on utilizing advanced technologies like decentralized finance (DeFi) and NFTs can enhance perceived ease of use and innovation perception among users (Venkatesh & Davis, 2000).The role of social influence, as revealed by this study, also has implications for platform design. Features that facilitate community building and peer recognition, such as virtual meetups and public showcases of entrepreneurial achievements, can foster collaboration and motivation. By emphasizing social connectivity, companies can create environments that enhance both individual entrepreneurial intention and the overall innovation ecosystem (Firmansyah & Kurniati, 2022).

F. Limitations and Future Research Directions

Despite its contributions, the study has several limitations. First, the cross-sectional design limits the ability to establish causality. While significant relationships were observed, longitudinal studies are necessary to examine how these relationships evolve over time. For example, tracking participants' entrepreneurial behaviors across different stages of metaverse engagement could provide deeper insights into the long-term impact of digital competencies and self-efficacy (Hair et al., 2021). Future research could also explore how sustained interactions within the metaverse influence innovation perception and entrepreneurial outcomes.Second, the reliance on self-reported data introduces the potential for response bias, such as social desirability bias. Participants may have overestimated their digital competencies or entrepreneurial orientation to align with perceived expectations. Future studies could incorporate objective measures, such as behavioral data from metaverse platforms, to validate self-reported findings

(Ringle et al., 2022). Mixed-method approaches combining quantitative surveys with qualitative interviews could also provide richer insights into the contextual factors shaping entrepreneurial behaviors.

Third, the sample's regional and cultural diversity, while noted, may not fully capture global variations in metaverse adoption. Economic conditions, technological infrastructure, and cultural attitudes toward entrepreneurship vary significantly across regions, influencing how individuals perceive and engage with the metaverse (Mystakidis, 2022). Comparative studies across countries or regions could provide valuable insights into these differences, informing more targeted strategies for promoting metaverse entrepreneurship.Additionally, the gender dynamics of metaverse entrepreneurship warrant further investigation. While this study observed a balanced gender distribution, exploring the unique challenges and opportunities faced by women in virtual ecosystems could uncover strategies for promoting gender equity. For instance, research could examine how mentorship programs and networking opportunities impact entrepreneurial self-efficacy and intention among women entrepreneurs (Dwivedi et al., 2022).

Future research should also investigate the impact of emerging technologies on metaverse entrepreneurship. Innovations such as artificial intelligence (AI), decentralized autonomous organizations (DAOs), and advanced VR/AR systems are likely to reshape the entrepreneurial landscape, creating new opportunities and challenges. Longitudinal studies that track these developments can provide forward-looking insights into how entrepreneurs adapt to and leverage technological advancements (Gupta et al., 2023).

IX. CONCLUSIONS

In conclusion, this study advances our understanding of the drivers of entrepreneurial intention in the metaverse, highlighting the interplay of individual traits, social dynamics, and innovation perception. The findings contribute to theory by validating the relevance of established frameworks in the context of virtual ecosystems and offer practical recommendations for stakeholders seeking to foster entrepreneurship in this emerging digital frontier. Addressing the limitations through future research will further enhance the knowledge base, ensuring that the metaverse evolves as an inclusive, innovative, and dynamic space for entrepreneurial growth.

REFERENCES

[1] Bandura, A. (1986). Social foundations of thought and action: A social cognitive theory. Englewood Cliffs, NJ: Prentice Hall.
[2] Carretero, S., Vuorikari, R., & Punie, Y. (2017). DigComp 2.1: The digital competence framework for citizens with eight proficiency levels and examples of use. Publications Office of the European Union.
[3] Covin, J. G., & Slevin, D. P. (1989). Strategic management of small firms in hostile and benign environments. Strategic Management Journal, 10(1), 75-87.
[4] Creswell, J. W., & Creswell, J. D. (2017). Research design: Qualitative, quantitative, and mixed methods approaches. Sage publications.
[5] Dwivedi, Y. K., Hughes, D. L., Baabdullah, A. M., Ribeiro-Navarrete, S., & Metri, B. (2022). Metaverse beyond the hype: Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice, and policy. International Journal of Information Management, 63, 102417.
[6] Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. Behavior Research Methods, 39(2), 175-191.
[7] Firmansyah, A., & Kurniati, A. (2022). Entrepreneurial intentions in the digital age: Understanding the influence of social networks and digital literacy. Journal of Digital Entrepreneurship, 4(3), 255-267.
[8] Gupta, S., Singh, A., & Kumar, R. (2023). Exploring metaverse entrepreneurship: The influence of digital literacy and innovation perception. Journal of Innovation and Entrepreneurship, 12(2), 187-202.
[9] Hair, J. F., Ringle, C. M., & Sarstedt, M. (2021). PLS-SEM: Indeed a silver bullet. Journal of Marketing Theory and Practice, 19(2), 139-152.
[10]Hastuti, R., Nuryakin, & Arifin, Z. (2023). Digital competencies and entrepreneurial orientation in metaverse: A systematic review. Entrepreneurship Research Journal, 14(1), 102-120.
[11]Huang, L., & Chen, W. (2020). Social networks and entrepreneurial success: Evidence from online communities. Entrepreneurship & Regional Development, 32(3-4), 185-202.
[12]Krueger, N. F., Reilly, M. D., & Carsrud, A. L. (2000). Competing models of entrepreneurial intentions. Journal of Business Venturing, 15(5-6), 411-432.
[13]Laeeq, K. (2021). Innovation in the metaverse: Opportunity recognition and the digital economy. Journal of Digital Innovation, 6(2), 137-149.
[14]Mystakidis, S. (2022). Metaverse and education: Reflections on opportunities and challenges for learning and teaching. Metaverse Education Journal, 1(1), 45-62.
[15]Ringle, C. M., Wende, S., & Becker, J. M. (2022). SmartPLS 4.0 Software. SmartPLS GmbH.

[16]Shapero, A., & Sokol, L. (1982). The social dimensions of entrepreneurship. Encyclopedia of Entrepreneurship, 72-90.
[17]Sundararajan, A., Zhang, X., & Lu, J. (2024). Entrepreneurial self-efficacy and metaverse business opportunities: A TAM-based perspective. Metaverse Business Journal, 3(1), 12-28.
[18]Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. Management Science, 46(2), 186-204.
[19]Wang, Y., & Xu, J. (2023). Social influence in digital entrepreneurship: A case study in the metaverse. Digital Entrepreneurship Research, 8(1), 85-103.
[20]Zhao, H., Seibert, S. E., & Hills, G. E. (2005). The mediating role of self-efficacy in the development of entrepreneurial intentions. Journal of Applied Psychology, 90(6), 1265-1272.