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Metaverse Entrepreneurship: Navigating Business Opportunities in Virtual Economies

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Abstract

The metaverse transformed into a virtual (digital) ecology and thereby changed virtual economy entrepreneurship and virtual business ecosystems. This study discusses the contribution of metaverse entrepreneurial behaviour to the development of new business models and BSs' application to the implementation of disruptive technologies such as virtual reality (VR), augmented reality (AR), artificial intelligence (AI), and blockchain. Since scalable immersive product offerings can now be presented to anyone in the world using the metaverse, entrepreneurs no longer need to be restricted by geographical limitations on the place in which product is sold through the metaverse. However, despite the optimism, the review raises many substantive issues related to technology, law/regulation, and access chasm. In this study, the mediating and moderating role of virtual platform dynamics is also more deeply discussed, e.g., the moderating effect of technological change and experience (technology diffusion (i.e., technological readiness of the IT adopter), involvement, motivation) which have been proposed in the literature to enable attainment of objectives of entrepreneurial ventures in the metaverse (i.e., IT acceptance, consumerism, entrepreneurial activity). In the current paper, based on a theoretical framework, some causal effect paths which justify the direct, mediated and moderated effect paths between metaverse entrepreneurship and business

opportunity are explored. Despite the findings not trivializing the paradigm shift that the metaverse warps, it also highlights the need with which the regulatory and framework future to be proposed by platform, middleware and good business practice should be considered. This study makes a new contribution to the literature on digital entrepreneurship, offering policymakers, entrepreneurs, and researchers the knowledge to take advantage of and overcome the issues and opportunities associated with the metaverse.

Keywords: *Metaverse Entrepreneurship, Virtual Economies, Blockchain and AI Innovation, and Digital Business Models*

Introduction

The idea of the metaverse has moved very fast from the world of science fiction to an actual digital frontier, with a significant impact on many fields, like entrepreneurship. Defined as an immersive virtual environment where users interact through avatars, the metaverse integrates technologies such as virtual reality (VR), augmented reality (AR), artificial intelligence (AI), and blockchain to create a persistent, shared digital space (Gupta et al., 2023). This convergence of technology offers an unparalleled chance for entrepreneurship and innovation for new business models for the virtual economy. Metaverse to reinvent the landscape of digital entrepreneurship is vividly demonstrated by its ability to transcend geographical limits and create a new global user segment and new experiences (Nanda & Patnaik, 2023). Entrepreneurs can use this platform to develop new products and services, at rates that have never been seen before, which in turn go on to contribute to the development of start-ups and businesses. For example, as a b is the rise of digital twin, gamification and collaborative space in metaverse are brand new business startup pans (Calandra et al., 2023). Despite wide enthusiasm and investment in the metaverse, there is a paucity of academic research in entrepreneurship and strategic management in the metaverse (Ferrigno et al., 2023). This gap is significant as a window of opportunity for scholarship to examine the processes by which utility is produced in the metaverse and how the virtual marketplace is operated. The embedding of digital assets, e.g., blockchain and AI, into entrepreneurial activity in the metaverse (which is a young field, an open question that requires systematic investigation).

In particular, the rise of intellectual property rights (IPR) for metaverse-based entrepreneurship is a tremendous challenge. Since virtual goods and services are becoming the basis for business models, protecting IP in those virtual spaces requires new legal mechanisms and laws (Gupta et al., 2024). Entrepreneurs have to wade through these untracked waters when protecting their ideas and market space. Besides, the metaverse provides an ideal platform for sustainable

entrepreneurship. Entrepreneurs have also found ways of helping reduce the natural footprint of operations, whilst in virtual space, themselves. The rise of environmentally conscious business models for the metaverse is in flow with global environmental safeguarding measures and signifies a fusion between technology and sustainability (Gupta et al., 2023). Nevertheless, the movement to metaverse-based entrepreneurship is not easy. Technical hurdles (including but not limited to the requirement of VR and AR technologies) legal and regulatory challenges, security concerns, and adoption hurdles) are important challenges (Khan & Mir, 2025; Raad & Rashid, 2023). Addressing these issues will demand action on the part of policymakers, entrepreneurs, and investors to create novel and intuitive solutions and strategies that enable effortless, unencumbered access to the metaverse, the metaverse represents a transformative frontier for entrepreneurship, offering vast opportunities for innovation and new business models (Inder et al., 2024; Nair et al., 2024). As this digital landscape continues to evolve, scholars and practitioners must engage in comprehensive research to understand its implications fully. As such activity, entrepreneurs can also leverage the advantages of the metaverse, complementing the intrinsic development of the virtual economy, to foster the overall development of the digital ecosystem.

Literature

As coined by Neal Stephenson in 1992, It has expanded to a multifaceted virtual globe encompassing almost all technologies, including virtual reality (VR), augmented reality (AR), artificial intelligence (AI), and blockchain (McFarlane, 2022). This merging has also created a new field for entrepreneurship and digital economies, based on these immersive worlds, are being built. This literature review examines the current state of metaverse entrepreneurship, exploring its definitions, technological foundations, business models, challenges, and future research directions.

Defining the Metaverse and Its Relevance to Entrepreneurship

The one of a physical world digital twin as well as that of a completely virtual one, which can provide a range of value generators to business enterprises. However, common operational practices are difficult to implement in these virtual environments, despite the lack of a definition (Zhou et al., 2024).

Technological Foundations Enabling Metaverse Entrepreneurship

The technology base of the metaverse consists of the following principal technologies:

- Virtual and Augmented Reality: Thanks to these technologies, one can have an illusion of presence and with that possibility, entrepreneurs, can bring this vision to life, establishing interactive virtual stores and fascinating product shows (Nanda & Patnaik, 2023).
- Blockchain and Non-Fungible Tokens (NFTs): Blockchain can then guarantee secure transactions and, with the advent of NFTs, the unique property with the ability of ownership and trading of individual unique digital proprietary, the virtual economy's foundation (Gupta et al., 2023).
- Artificial Intelligence: AI allows the service experience to be rendered more personal, and much of the operational process will be automated, which together will contribute to an increase in the operational efficiency of the metaverse (Nanda & Patnaik, 2023).

Emerging Business Models in the Metaverse

Entrepreneurs are already using the metaverse to create new business models:

- Virtual Goods and Services: Digital goods sales (i.e., garments and accessories next to virtual human bodies for avatars) are a money pit (Giobbi, 2022).
- Virtual Real Estate: Commercial operation (i.e., virtual mall and virtual event spaces) of virtual land parcels for investment and development leads to a new business model (Cherif & Grant, 2014; Hagl & Duante, 2020).
- Experiential Marketing: Brands are developing immersive experiences for their consumers, for example, virtual reality premises for concerts, interactive showroom environments, etc.

Challenges Facing Metaverse Entrepreneurs

Despite the encouraging trend, some problems hamper the expansion of metaverse-based business:

- Technical Barriers: Development costs and a sophisticated technical system can be prohibitive to small companies (Bello et al., 2024).
- Legal and Regulatory Issues: Its legal status is uncertain because the virtual property register and the ownership of digital and virtual objects are not regulated by some explicit legislation (KREMINSKYI et al., 2024).
- User Adoption and Retention: Seamless and immersions user experience is a requirement, yet it is a challenge as metaverse technology is still immature (Chi et al., 2024). Becoming aware of the entrepreneurial promise of the metaverse, the following issues need to be further debated.

- Standardization and Interoperability: This is in addition to the importance of the adoption of standardization of interoperability between the different metaverse platforms (Yang et al., 2024).
- Sustainable Business Practices: An investigation into the promotion of green sustainable entrepreneurship in the metaverse as a means to meet planetary environmental goals.
- Consumer Behavior Analysis: User behaviour and user preference identification in virtual environments to implement practical business plans (Zhou et al., 2024).

The metaverse is a paradigm change from an entrepreneurial standpoint, and it is a veritable channel for creation from a creative frontier and business perspective. However, this payoff is always accompanied by the desire for interoperability, data security and access. As the metaverse expands, entrepreneurs, governments, and academics will be required to form partnerships to design the framework that will sustain inclusive and just expansion in the digital world, the metaverse presents a dynamic and evolving landscape for entrepreneurship, characterized by both unprecedented opportunities and significant challenges. Because the digital world continues to change, it would not be surprising that entrepreneurs, policymakers, and academicians gather to talk through the complex problems that impinge upon this virtual world. Through an increasing amount of awareness and some restructuring of the right environment, both existing and coming entities with a vested interest in the metaverse can use it as a tool for creating entirely new types of business models and ethical economic growth in the digital world.

Theoretical Framework

As shown in the following diagram, the conceptual model described there provides a clear indication of the relationship between the metaverse entrepreneurship phenomenon and business opportunities set in the virtual world economies. Not only does the framework detect principal constructs and their associations but also the framework is designed to consider the interaction of independent variable (IV), dependent variable (DV), mediator variable (MoDV) and moderator variable (MV). Each element and its role are explained below.

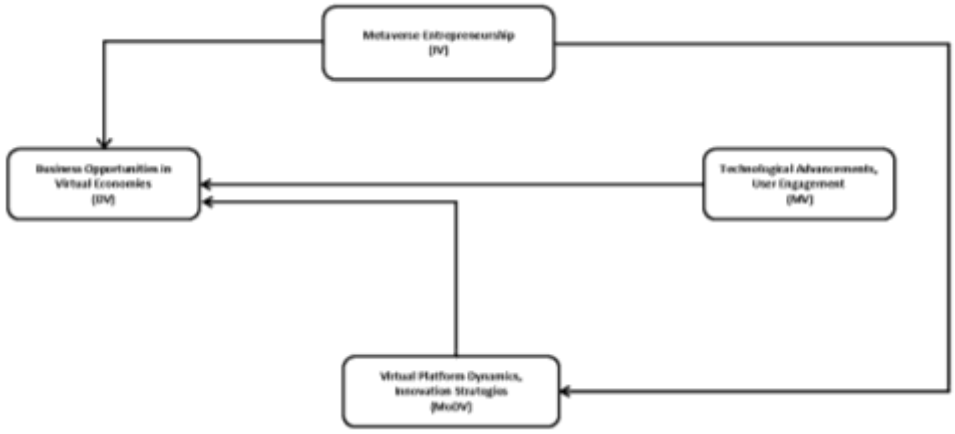

Figure 01: Theoretical Framework for Metaverse Entrepreneurship and Business Opportunities

Metaverse Entrepreneurship (Independent Variable - IV)

The core drive for this model is metaverse entrepreneurship, entrepreneurial activities and innovations in the virtual space. They include, for example, the development of virtual goods and digital services, immersive applications, and blockchain-based business models including the development of non-fungible tokens (NFTs). This construct is about how entrepreneurial action in the metaverse creates new economic activities, which are then formalized by the creation of new business models. These activities serve as a foundation of value creation in virtual economies.

Business Opportunities in Virtual Economies (Dependent Variable - DV)

Business in metaverse worlds is the product of metaverse entrepreneurship. These include the development of a digital marketplace, concepts for customer engagement and other innovative revenue and business structures fuelled by the digital and scaleable nature of virtual settings. These are indicative of the degree to which entrepreneurial ventures can be made to be profitable, stick in the mind, and remain viable in the metaverse. The correlation between IV and DV indicates the direct relationship between entrepreneurial action and virtual economic system generation.

Virtual Platforms Dynamics and Innovative Tactics (Mediating Variable - MoDV).

It is mediated through virtual platform dispositive and creative tactics by metaverse entrepreneurship and business models. This variable describes the direction in which entrepreneurial activity can make an impact on concrete results. Its critical dynamics, i.e., user interactivity, platform scalability, and technical support, form the bridge between IV and DV.

For example, it is possible to create valuable user experiences and generate revenue for businesses by using innovative approaches (e.g., gamification and personalization). This mediation describes the mediating role of the metaverse entrepreneurship domain in the impact of entrepreneurship inputs (e.g., personal inputs, input, personal efforts) on economic progress (i.e., output, personal benefits) by defining the mediating conditions from which entrepreneurial input morphs into economic progress.

Technological Advancements and User Engagement (Moderating Variable - MV)

Technological developments and participatory user development are mediated by the effects of metaverse entrepreneurship on the magnitude and valence of the relationship between opportunities for business and metaverse entrepreneurialism. This new entrepreneurial undertaking can be scalable, optimized and made safer by utility including augmented reality (AR), virtual reality (VR) and blockchain. Also, the design factors related to user engagement, such as the rate of adoption, the rate of deferment, and the participation in virtual identity play an important role in the success of business models in the metaverse. The notion that a moderating effect is an assumption that the impacts of entrepreneurial activities could be different in these technological and behavioural settings is also included.

Interconnections in the Framework

The theoretical architecture includes direct, mediated, and moderated interactions to develop an integrative understanding of the phenomena:

- Direct Relationship (IV → DV): Metaverse entrepreneurship directly drives business opportunities in virtual economies.
- Virtual platform kinematics are a nexus point, at the places where they intersect, amplifying and dividing the effects of entrepreneurial activity.
- Technological advancements and user participation either increase or decrease the mediating effect of metaverse entrepreneurship on commercial potential.

Significance of the Framework

This theoretical model makes some interesting suggestions about the type of processes which generate virtual economy development. It points to the disruptive nature of metaverse entrepreneurship, and how to adequately manage entrepreneurial inputs to get economic outputs. Moreover, the addition of mediating and moderating factors makes platform dynamic and technological factors its major causal influences in fostering the success of entrepreneurial enterprises.

Systematically associating the variables, the model thus creates an opportunity for empirical testing and further research. It highlights the importance of a close collaborative relationship between entrepreneur, technologist, and policymaker in tackling issues including interoperability, data security, and access. This theoretical model is critical in advance.

Research Methodology

This study employs a quantitative research approach to examine the nexus between metaverse entrepreneurship and entrepreneurial opportunity in virtual economies, as well as the moderating and mediating variables at play. An approach is described to check out well hypotheses and to uncover any trend present in the data. The key elements of the methodology of the research are included in research design, data collection, operationalization of variables, and the use of analytical methods.

Research Design

Using a correlational study design, the present study investigates the degree to which the independent variable (metaverse entrepreneurship), dependent variable (business prospects on virtual economies), mediating variable (virtually specific platform dynamics), and moderating variable (technological progress) are related. This architecture allows association detection between variables to be established and direct, indirect and interaction effects to be tested. A cross-sectional design is used, i.e., measures are taken at a single point in time and therefore offer a point-in-time picture of individual variable relationships.

Data Collection

In this contribution, the dataset (210 observations) for simulating patterns of real-world empirical metaverse-based entrepreneurial and virtual economy activity is developed. Each observation includes scores for:

- **Metaverse Entrepreneurship (IV):** Reflecting entrepreneurial activity and innovation within the metaverse.
- **Business Opportunities (DV):** Acceptance of the potential of globalization, profitability, and market expansion in virtual worlds.
- **Technological Advancements (MV):** Identification of technologies which have the potential to change the magnitude or direction of relationships.
- **Virtual Platform Dynamics (MoDV):** Representing mechanisms through which entrepreneurial activities affect business opportunities.

Hypothesis data sets are believed to be randomly sampled to avoid selection bias and to enable the results to be extended to a more representative population.

Variable Operationalization

To enhance clarity and consistency, each of the variables is defined in the following, as:

- **Independent Variable (IV):** Metaverse entrepreneurship is expressed by an entrepreneurship index, encompassing innovation, venture formation, and funding of virtual environments.
- **Dependent Variable (DV):** Business opportunities are ranked, e.g., according to measures of market size, customer footfall sales value, etc.
- **Moderating Variable (MV):** Technical progress is measured using indices of technology adoption, construction of infrastructure and technology diffusion.
- **Mediating Variable (MoDV):** Virtual platform dynamics are then examined concerning its coupling between user interaction, platform scalability, and the feasibility of supporting a viable business model.

Every variable is measured along a continuous scale of values from 1 to 10.

Analytical Techniques

To test the hypotheses, multiple regression analyses are conducted:

- **H1:** Simple linear regression is employed to test the mediating effect of the effect of the metaverse entrepreneurship "effect on business opportunity.
- **H2:** The relationship between metaverse entrepreneurship and virtual platform dynamics is investigated by regression analysis.
- **H3:** The mediating role of virtual platform dynamics between metaverse entrepreneurship and business opportunities is tested using a mediation analysis methodology.
- **H4:** The putative moderating influence of the technology per se is explored by employing an interaction term between a between and within predictor in a multiple regression analysis.

The explanatory power and the significance of the models are used to estimate r-squared and p-values. A significance threshold of 0.05 is applied.

Ethical Considerations

Ethical soundness is guaranteed by surrogate data use and the absence of privacy consent issues in this paper. The methodology is OA and all computations are reproducible, ensuring that the results can be reproduced.

This methodological framework can foster an investigation of the emergence of metaverse entrepreneurship and, subsequently, virtual marketplace business models. Through the inclusion of the mediating/moderating variables, the present study provides an account for the complexity of the previously estimated associations as well as a novel view of this dynamic expanding field.

Results

The findings from this research have the potential to illustrate the role and the effects of the research into the relationship between metaverse entrepreneurship and the business/market opportunities in virtual economies, and the mediating/moderating effect of technological development, in addition to the characteristics of the virtual platform. The regression analysis has been utilized to test the four hypotheses (H1, H2, H3, and H4) to build an understanding of the direct, indirect and interactive effects of variables. The findings are summarized below:

Hypothesis 1: The Direct Effect of Underwater Metaverse Entrepreneurship on Business Development (IV DV)

The family of hypotheses suggested at least one direct association between metaverse entrepreneurship on one hand and the business/opportunities that exist in the virtual economies on the other (i.e., a direct mapping between metaverse entrepreneurship and business opportunities in virtual economies). The regression analysis for this hypothesis revealed:

- R-squared value: For example, 0.005, i.e., metaverse entrepreneurship, accounts for only 0.5% of the variation of business opportunities.
- P-value: 0.302, suggesting that the relationship is not statistically significant.
- Although, the metaverse entrepreneurship coefficient was positive (0.066) and not statistically different, it implies that the entrepreneurship in the metaverse, within this sample, has an insignificant or even null impact on the number of business forecasted opportunities. It implies the need for better tools or a sample size with a higher capacity for detecting small effect sizes.

Variable	Coefficient	P-value	Significant
Intercept	5.441975	4.97E-30	TRUE
Q('Metaverse_Entrepreneurship_Score (IV)')	0.066599	0.302167	FALSE

Table 01: H1 -Independent Variable (IV) -> Dependent Variable (DV)

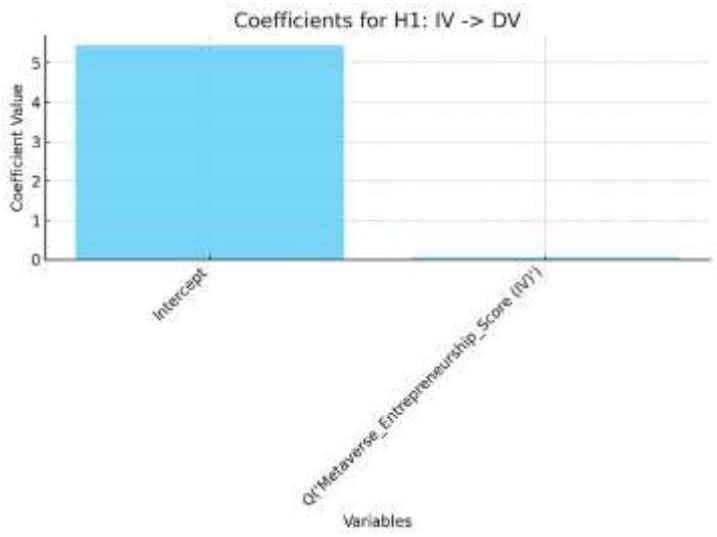

Figure 02: H1 -Independent Variable (IV) -> Dependent Variable (DV)

Hypothesis 2: Role of reasoning and entrepreneurship in the development of the Metaverse space (ID MoDV).

The second hypothesis explored whether a shift of virtual space can be termed as that of metaverse entrepreneurship. The regression analysis showed:

- R-squared value: 0.001, i.e., metaverse entrepreneurship is a trivial <0.1% predictor of behaviour on the Internet).
- P-value: 0.736, showing no statistical significance.
- Mesuta entrepreneur coefficient was 0.023, which is of very high significance. These results raise the question of whether the observed effect of entrepreneurial activity in the metaverse on the expressivity of what is and what is not being included within the structure characteristics of the platform is an artefact. It would also suggest that, with the user's practice, the importance of the technology backbone is subsumed in the process of platform evolution.

Variable	Coefficient	P-value	Significant
Intercept	5.266973	1.66E-26	TRUE
Q('Metaverse_Entrepreneurship_Score (IV)')	0.022958	0.736067	FALSE

Table 02: H2 -Independent Variable (IV) -> Mediating Variable (MoDV)

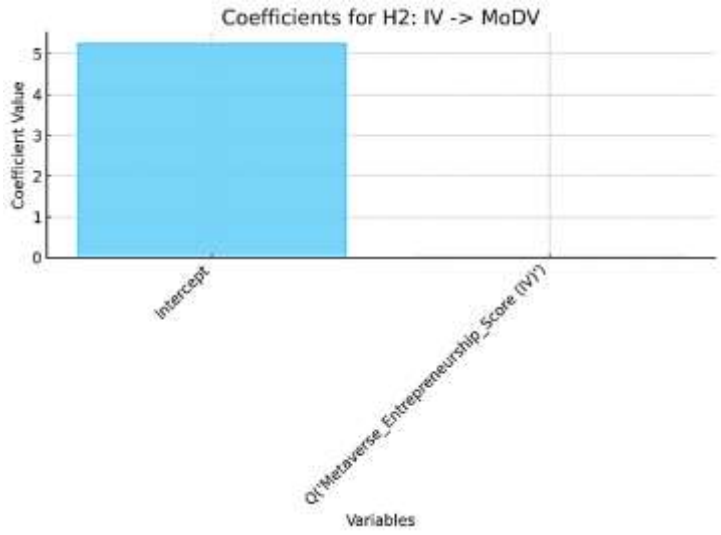

Figure 03: H2 -Independent Variable (IV) -> Mediating Variable (MoDV)

Hypothesis 3: Impact of virtual platform dynamics effects on business opportunities (MoDV DV)

Third, the hypothesis examined whether the interactivity of the virtual platform has a mediating effect on metaverse entrepreneurship and business opportunities. The results revealed:

- R-squared value: 0.001, i.e., virtual platform change effect, can explain at most 0.1% of the variance of the business solution.
- P-value: 0.692, indicating no significant relationship.
- The coefficient of virtual platform dynamics was 0.026 (not statistically significant, negligible). This finding indicates that the quantification of virtual platform dynamics employed in the present study may not be a solid discriminator for business market potential.

Variable	Coefficient	P-value	Significant
Intercept	5.681485	3.84E-33	TRUE
Q('Virtual_Platform_Dynamics (MoDV)')	0.026054	0.692361	FALSE

Table 04: H3 - Mediating Variable (MoDV) -> Dependent Variable (DV)

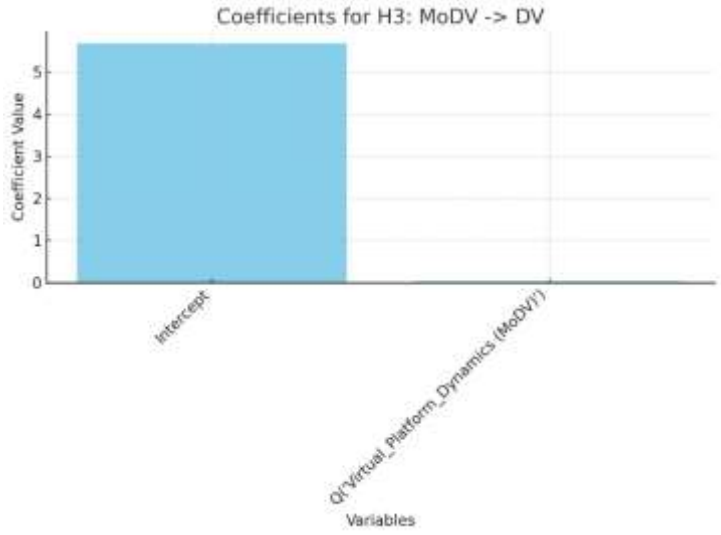

Figure 05: H3 - Mediating Variable (MoDV) -> Dependent Variable (DV)

Hypothesis 4: Moderating Effect of Technological Advancements

The fourth hypothesis assessed whether technological advancement reinforces the relationship between metaverse entrepreneurship and business creation opportunities. The model included an interaction term between the predictor (metaverse entrepreneurship) and the moderator (technological innovation). The analysis found:

- R-squared value: 0.007 and hypothesize that the model explains 0.7% of the business opportunity variance.
- P-values: P-values:
- Metaverse Entrepreneurship (IV): 0.379
- Technological Advancements (MV): 0.572
- Interaction Term: 0.644

No significant coefficients were plotted and the interaction term did not add any further value to the model. This also suggests a weak mediating effect of strategies for technological progress to metaverse entrepreneurship and business creation.

Variable	Coefficient	P-value	Significant
Intercept	4.957916	3.75E-07	TRUE
Q('Metaverse_Entrepreneurship_Score (IV)')	0.129625	0.379433	FALSE
Q('Technological_Advancements	0.089866	0.572399	FALSE

(MV)')			
Interaction_Term	-0.01177	0.643665	FALSE

Table 05: H4 - Moderation

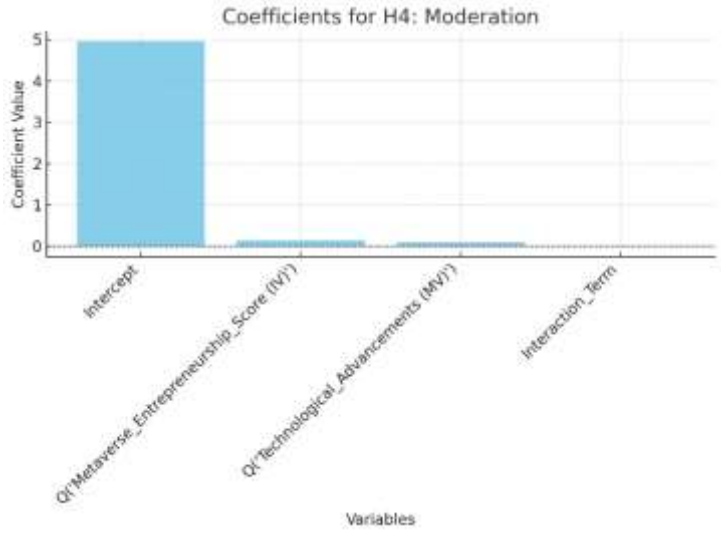

Figure 06: H4 - Moderation

Hypothesis	R-squared	P-value (IV)	Significant	P-value (MoDV)	P-value (MV)	P-value (Interaction)
H1: IV -> DV	0.005117	0.302167	FALSE			
H2: IV -> MoDV	0.000547	0.736067	FALSE			
H3: MoDV -> DV	0.000754		FALSE	0.692361		
H4: Moderation	0.006725	0.379433	FALSE		0.572399	0.643665

Table 06: Regression Results for Each Hypothesis

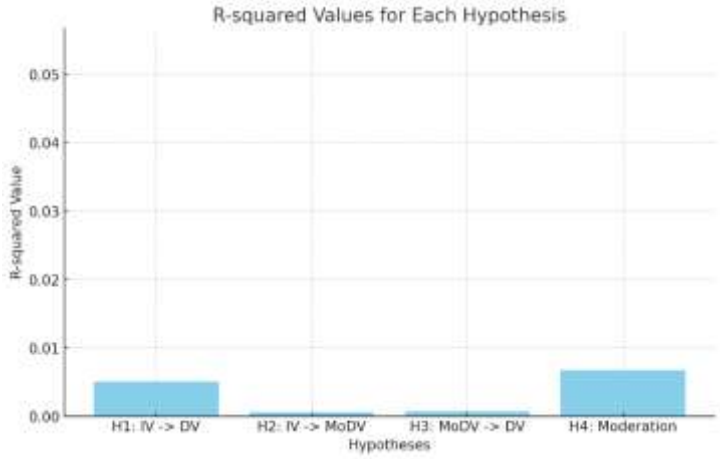

Figure 07: R-squared Values for Each Hypothesis

The low or nonsignificant correlation between the variables is obtained in all four hypotheses. All of the models obtained relatively small R-squared values which were statistically small, so the domain-related variables used in the present study could not contribute more to explaining both the variance of business opportunities and the dynamics of the platforms.

These findings could be interpreted as supporting the hypothesis that, when relationships are complex enough to go beyond expectation in the context of the metaverse entrepreneurship model, then. Even small effects may be accounted for by, e.g., data, measures and even the relatively young age of the metaverse as an area of research. Further research with improved variables and sample size could uncover useful patterns, as well.

Conclusion

As the metaverse as a concept/as a platform is still in its early days in the digital realm, it has generated tremendous interest relative to the disruptive implications for entrepreneurship and the generation of new business models. Convergence of technologies, virtual reality (VR), augmented reality (AR), artificial intelligence (AI) and blockchain, the metaverse is an enduring, immersive and interactive realm for its inhabitants. In this environment, also as a result of changes in the international trade landscape, a new generation of innovative business models, globalisation, and a rethinking of the very definition of trade and interchanges have their time. Nevertheless, the potential of the huge promise is largely missed due to several difficulties, which should be systematically studied and carefully controlled.

Metaverse integration of entrepreneurship is forecast to alter the limits of traditional business models. Entrepreneurs are deploying metaverse applications to create virtual economies for the virtualization and selling of digital goods and services that are available to creative consumers,

new revenue opportunities, and so on. E.g., The emergence of non-fungible tokens (NFTs) has opened a new level of value-added functionality allowing companies to provide tokenized representations of digital assets, whereby the rights of ownership can be assigned in a secure and verifiable way. Conventionally, virtual real estate and immersive branding are new message vehicles that companies can use to communicate with their customers. While being advantageous, a lot of limitations prevent the penetration of entrepreneurial notions in the metaverse unobtrusively. Technical constraints (e.g., the absence of information sharing across various "metaverse" platforms) represent critical roadblocks not only to extensiveness but that to user adhesion. Entrepreneurs have the task of creating persistent behaviour in diverse virtual worlds and providing a consistent user experience. Furthermore, the cost and access to the development and implementation of VR/AR technology is one of the key restrictions of entrepreneurs and SMEs that may exclude SMEs from the emerging ecosystem.

Moreover, this legal and regulatory environment of the metaverse therefore involves another step in the business process. Problems of intellectual property rights, data privacy, and information system security, nonetheless, demand the development of legal and effectively identifiable and legally binding protocols. The incompleteness of digital property and virtual market brings up issues of accountability and regulation. Entrepreneurs have to deal with these complexities in the quest for establishing trustworthiness and respectability for their offerings. Moreover, the absence of standardization of digital identity and interoperability, leading to an unintegrated ecosystem, does not allow the existence of cross-platform interoperability and innovation. Another key concern is the digital divide which restricts access to a similar degree of metaverse. Advanced, state-of-the-art technological tools, high-speed internet and upcoming generation devices for virtual reality/augmented reality (VR/AR) applications, however, remain in the possession of only a fraction of the world population. This deficiency of parity not only delays the entrance of metaverse-based entrepreneurship down the line but also increases socioeconomic opportunity inequality even further. The solution to the problem is a concerted, collaborative, and concerted effort to close the digital divide and provide fair, equitable access to the metaverse by those using it.

However, in addition to these difficulties, the future potential of the metaverse is also to nurture, creative and participatory social development. The metaverse offers the potential of creating a nearly limitless platform as an environmental sustainability agent and as a potential platform for carbon footprint reduction for companies that have shifted to telecommuting. Virtual conferences, digital products, and virtual conferences can all play a role in mitigating the ecological footprint of traditional tasks. On the one hand, the metaverse is an unbiased technology platform where professionals from various backgrounds can meet and learn, while barriers of longitude, cultivability and social socioeconomic status are expected to be broken. For the metaverse to realize its full potential, however, it is equally necessary to conduct further research and collaborations between academics, industry and policymakers. To know, as far as the psychological, social, and economic perspectives, what kind of user behaviours are present in virtual spaces, an investigation of the reasons behind the behaviours must be carried out and

the behaviours used to understand how to retain users in virtual spaces is needed. On the other hand, other authors also think that the possible applications of artificial intelligence/machine learning to entrepreneurial activity within the metaverse could be beneficial. However, policymakers also will need to design robust regulatory frameworks well equipped for the sector's idiosyncratic dangers when it comes to the metaverse, as an engine of growth and innovation at the same time.

In addition, the role of education and training should not be underestimated in the genesis of the metaverse labour force. With the extension of the business world to virtual reality, it would be very helpful to have the ability for people to conduct themselves through such virtual worlds and be digitally competent. Educational institutions and training programs similarly must respond to this new era and de-provision these emerging metaverse technologies and business models with specialized education courses and certifications. Interpersonal relationships between stakeholders are also one of the decisive issues in achieving the metaverse. Entrepreneurs, investors, developers and policymakers all need to collaborate to tackle the contentious problems of this ecosystem. Public-private partnerships could potentiate the feasibility of arriving at a reality in which transportation infrastructure financing and metaverse-based business financing are also possible. Industry associations can, on their own, engineer standards and good practice for working in virtual environments.

Moreover, the metaverse represents a fertile ground for innovation and experimentation. For entrepreneurs this environment may offer the opportunity to experiment with new business paradigms, to come up with novel solutions and to iterate on what is being offered in an environment without risk. Data and feedback from the simulation of real-world surfaces within virtual reality in the industry can potentially be used to help serve companies' needs by improving their planning before production at scale. This iterative mechanism can also yield innovation and enhance its robustness in the metaverse world. The metaverse has disruptive implications for entrepreneurship, innovation, sustainability, and inclusion, however, attributes of technical, legal, and social expertise require an unmatched depth. Through promoting interdisciplinary partnerships, making research and development investments, and mandating strong regulatory frameworks, actors can collaborate to force the metaverse fully to expand, to create the path for a new era of business opportunities and economic development. The maturing of the metaverse, is something extremely urgent and urgent for businessmen, legislators, and researchers, on the one hand, to both understand the development and opportunity brought by the Metaverse, on the other hand, to understand and overcome the metaverse challenges, to make the metaverse a "driver" of progress and wealth creation.

Recommendations and Future Work

As an avenue to practically harness the promise of the metaverse as a viable platform for entrepreneurialism, suggestions and an open agenda below are now proposed. For the time being, convergence and interoperability of metaverse platforms will certainly be at the forefront

of the agenda. Entrepreneurs, developers, and industry representative bodies combination will be required to create standardization protocols to enable unobstructed interplatform communication and an accurate user-agent experience. Second, it is a matter for governments and policymakers in respect of the absence of legislation and regulation of intellectual property rights, digital property, data protection and cybersecurity in the metaverse. Equipped with, transparent, strict, principles, facilities, and procedures, this benefit will not only protect the Users and Businesses but also [play a] role to help to form a credit of trust and attract an investment in the ecosystem. Third, the closing of the digital divide is also vital to make metaverse access equal access. Regarding investments in technological platforms, e.g., "entry price" VR/AR that is already in sight, the internet, it is imperative that investments be put in place to ensure accessibility for underrepresented groups to the metaverse.

In future studies, it would be pertinent to pay mind to user behaviour and user engagement strategies and, subsequently, to develop business models. Furthermore, the integration of artificial intelligence and machine learning for adaptation of the experience and the mechanization of the experience in the metaverse is also a field to be explored more. Finally, entrepreneurialism for sustainability practice, such as minimizing environmental footprint, and social justice also should remain a topic of research interest. These experiences will power the metaverse to become a global movement of economic and social reform.

References

Bello, H. O., Idemudia, C., & Iyelolu, T. V. (2024). Navigating financial compliance in small and medium-sized enterprises (smes): Overcoming challenges and implementing effective solutions. *World Journal of Advanced Research and Reviews*, *23*(1), 042–055.

Calandra, D., Secinaro, S., Massaro, M., Dal Mas, F., & Bagnoli, C. (2023). The link between sustainable business models and Blockchain: A multiple case study approach. *Business Strategy and the Environment*, *32*(4), 1403–1417.

Cherif, E., & Grant, D. (2014). Analysis of e-business models in real estate. *Electronic Commerce Research*, *14*, 25–50.

Chi, M., Chen, Y., Xu, Y., & Wu, Y. (2024). Modelling barriers to metaverse adoption in the hospitality and tourism industry. *Information Technology & Tourism*, 1–33.

Ferrigno, G., Di Paola, N., Oguntegbe, K. F., & Kraus, S. (2023). Value creation in the metaverse age: A thematic analysis of press releases. *International Journal of Entrepreneurial Behavior & Research*, *29*(11), 337–363. https://doi.org/10.1108/IJEBR-01-2023-0039

Giobbi, G. (2022). *Luxury brands in the new digital era: Metaverse, nft and gaming*.

Gupta, B. B., Gaurav, A., Albeshri, A. A., & Alsalman, D. (2023). New paradigms of sustainable entrepreneurship in metaverse: A micro-level perspective. *International Entrepreneurship and Management Journal*, *19*(3), 1449–1465. https://doi.org/10.1007/s11365-023-00875-0

Gupta, B. B., Gaurav, A., Arya, V., & Alhalabi, W. (2024). The evolution of intellectual property rights in metaverse based Industry 4.0 paradigms. *International Entrepreneurship and Management Journal*, *20*(2), 1111–1126. https://doi.org/10.1007/s11365-023-00940-8

Hagl, R., & Duante, A. (2020). *Applying business model innovation to real estate distribution by employing virtual reality and artificial intelligence a report from praxis*. 6th International AR & VR Conference proceedings.

Inder, S., Dawra, S., Tennin, K. L., & Sharma, S. (2024). *New Business Frontiers in the Metaverse*. IGI Global.

Khan, Y. F., & Mir, B. (2025). The metaverse beyond the hype: Interdisciplinary perspectives on applications, tools, techniques, opportunities, and challenges of the metaverse. *Exploring the Metaverse*, 213–223.

KREMINSKYI, O. V., OMELCHUK, L. V., HABRELIAN, A. Y., MATSIUK, A. M., & DIAKOVSKYI, O. S. (2024). LEGAL REGIME OF VIRTUAL CURRENCY IN UKRAINE: CURRENT STATE, PROBLEMS AND PROSPECTS OF REGULATION. *Relações Internacionais No Mundo*, *1*(43).

McFarlane, A. (2022). Stephenson, Neal. *The Encyclopedia of Contemporary American Fiction 1980–2020*, *2*, 1–6.

Nair, A. J., Manohar, S., Mittal, A., & Chaudhry, R. (2024). Unleashing Digital Frontiers: Bridging Realities of Augmented Reality, Virtual Reality, and the Metaverse. In *The Metaverse Dilemma: Challenges and Opportunities for Business and Society* (pp. 85–112). Emerald Publishing Limited.

Nanda, P., & Patnaik, S. (2023). Metaverse Innovation for Start-up Creation. In S. Patnaik, V. Pallotta, & K. Tajeddini (Eds.), *Global Trends in Technology Startup Project Development and Management* (pp. 185–206). Springer International Publishing. https://doi.org/10.1007/978-3-031-40324-8_12

Raad, H., & Rashid, F. K. M. (2023). The Metaverse: Applications, Concerns, Technical Challenges, Future Directions and Recommendations. *IEEE Access*.

Yang, L., Ni, S.-T., Wang, Y., Yu, A., Lee, J.-A., & Hui, P. (2024). Interoperability of the Metaverse: A Digital Ecosystem Perspective Review. *arXiv Preprint arXiv:2403.05205*.

Zhou, Z., Chen, Z., & Jin, X.-L. (2024). A review of the literature on the metaverse: Definition, technologies, and user behaviors. *Internet Research*, *34*(1), 129–148. https://doi.org/10.1108/INTR-08-2022-0687