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Examining the Impact of Digital Economy on Consumer Preferences in the Metaverse Era: An Empirical Study on the Role of NFTs and Tokenization in Changing Purchase Intentions

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Abstract: This study aims to investigate the impact of the digital economy on consumer preferences in the Metaverse era, focusing on the role of Non-Fungible Tokens (NFTs) and tokenization in changing purchase intentions. Using a mixed-methods approach, this study combines quantitative and qualitative analysis to gain a comprehensive understanding of the key determinants of consumer purchase intentions in a rapidly evolving digital context. The results of the quantitative analysis show that perceived value, trust in blockchain technology, and user experience significantly influence consumer purchase intentions towards NFTs. Qualitative analysis through in-depth interviews reveals that scarcity, digital ownership, and community involvement are the main factors driving NFT adoption, while lack of technological understanding and regulatory uncertainty are the main barriers. This study also introduces novelty through the use of machine learning-based sentiment analysis and social network analysis to explore the role of social interactions in the formation of purchase intentions. These findings make important contributions to the literature on the digital economy by offering new insights into consumer dynamics in the Metaverse and highlighting the need for marketing strategies that focus on creating community value and immersive user experiences. Practical implications of this study include the need for consumer education and clear regulations to increase NFT adoption, as well as marketing strategies that leverage the emotional value and scarcity of digital assets. This research contributes to a better understanding of consumer behavior in the digital age and offers recommendations for further research in this area.

Keywords: Digital Economy, Consumer Preferences, Metaverse, NFT, Tokenization, Purchase Intentions.

1. INTRODUCTION

In the last several years, the digital economy has experienced a decline in responsiveness that has significantly impacted various aspects of consumer life, including purchasing preferences and interactions with digital products (Jiang and Stylos 2021). One of the most recent developments in the field of digital economy is the emergence of the Metaverse, a virtual community that enables users to interact with one another through digital avatars. Metaverse is not just a platform for hordes; it is also developing as a new economic marketplace with significant opportunities for digital trade, primarily through Non-Fungible Tokens (NFT) and tokenization. According Yilmaz, Sagfossen, and Velasco (2023), NFT has become a tool that significantly affects how consumers perceive and interact with digital platforms. NFT and tokenization have made it possible to have unique digital assets and validations from previously difficult-to-digital assets, such as digital games, virtual goods, and even physical assets (Wu, Liu, and Weng 2023). Utilizing NFT not only results in lower economic growth

but also increases consumer awareness of digital products, improves purchase confidence, and negatively impacts consumer behavior on a global scale. This is related to consumer behavior theory, which states that technological advancements can increase perceptions, which ultimately affect purchasing decisions (Kim, Ferrin, and Rao 2008; Yeo et al. 2022).

This technological adaptation also creates new challenges, mostly related to consumer trust and understanding regarding the security and validity of digital assets (Wang et al. 2021). Factors such as transaction security, ownership rights, and regulations become critical aspects that can influence consumer adoption and preferences for NFT and other digital assets. As an example, research conducted by Chang, Lai, and Yen (2024) indicates that consumer perceptions regarding the risk and complexity of technology might affect purchasing decisions, even when consumers may not recognize the innovative value of NFT. The purpose of this study is to investigate how NFT and tokenization affect consumer behavior in the Metaverse age by identifying the primary factors that hinder the adoption of this technology. Utilizing an empirical approach, this study will analyze data from surveys conducted with active users of the Metaverse platform to understand user perceptions, trust, and ease of use in determining user preferences. This study aims to provide theoretical and practical insights by presenting how businesses might use NFT to increase the day-to-day sales of their digital products. This study is relevant not just to academics and practitioners in the field of digital marketing, but also to those who are interested in understanding the economic implications of emerging technologies. By understanding the factors that affect student performance in the digital age, this study is expected to provide guidance for developing more effective teaching strategies in the Metaverse and encourage the adoption of more advanced digital technologies in the global economy (Ng 2022).

2. LITERATURE REVIEW

Digital economy has brought about significant changes in consumer behavior, particularly in the context of electronic commerce and digital technology interaction. The digital economy, defined by the advancement of technology, the internet, and innovative platforms, has forced consumers to adjust to new methods of purchasing and interacting with goods (Kılıçaslan and Ekizler 2022). Research indicates that this change will increase consumer preferences for more individualized and efficient service, which will be supported by data and digital analytics (Beqiri, Sadiku-Dushi, and Beqiri 2022). The term "metaverse," which refers to the integration of virtual reality, augmented reality, and interactive digital environments, has emerged as a new and emerging economic platform. Within the Metaverse, users are able to purchase, sell, and exchange digital assets using kripto or tokenized currency (Davis 2022). Jeong, Yi, and Kim (2022) conducted research which suggests that Metaverse not only provides new opportunities for digital commerce but also creates value through unique immersion experiences. Non-Fungible Tokens (NFT) are unique digital tokens that indicate the ownership of a certain asset or item, whether it be a karya seni, an item from a collection, or another type of digital asset. NFT has become an essential component of the Metaverse ecosystem, enabling the safe and international transfer and ownership of aset (Arjunwadkar and Ramageri 2024). According to Fortnow and Terry (2021), NFT offers consumers a day of free service because it provides them with digitally native devices and verified hardware that cannot be replaced or upgraded.

Tokenization is the process of transforming a physical asset, such as a blockchain-based token, into a digital asset that allows users to access more convenient and safe forms of ownership. Over time, tokenization can increase purchase niat by facilitating more efficient transactions and enabling mutual kepemilikan (García-Monleon et al. 2022). According to research by Lee (2019), tokenization not only increases consumer trust in digital transactions but also promotes increased participation in the digital economy. Consumer trust is a critical factor in the adoption of new technologies, especially in the digital environment where risks are constantly present. The perceptions of values derived from

digital assets, such as NFT, are affected by consumers' mistrust regarding the safety, security, and value of those assets (Król and Zdonek 2022). According to research by Lee and Kim (2023), consumer adoption is negatively impacted by consumers' lack of trust in blockchain technology.

NFT has social and religious implications in addition to economic ones. NFT gives artists and creators the ability to sell their work directly to consumers without using traditional channels, which can increase their income and exposure (Chalmers et al. 2022). This has the effect of democratizing the education and health sectors and influencing consumer preferences for unique and verified digital content. Blockchain technology, which serves as the foundation for NFT and tokenization, offers unchangeable transparency and security that is highly valued by digital consumers (Kuznetsov et al. 2024). According to Mashatan, Sangari, and Dehghani (2022). blockchain not only increases transaction efficiency but also lowers payment risk, which eventually affects consumer confidence when making purchases on the internet. Within the Metaverse context, gaming elements are frequently used to increase user engagement and strengthen consumer preferences about digital products (Shen et al. 2021). Gamification enables businesses to create more engaging and dynamic experiences, which can increase customer loyalty and niat. According to research by Liao and Teng (2017), gaming elements such as digital content creation and achievement can significantly increase consumer perception and loyalty.

Even though NFT offers many benefits, regulations still provide a significant obstacle to widespread adoption. Uncertain regulations pertaining to consumer rights, obligations, and protections may negatively impact consumers' willingness to participate in the NFT market (García-Monleon et al. 2022). According to recent research, policymakers must develop strict regulations that support innovation while shielding consumers from unintended risks (Wang et al., 2023). By increasing the use of NFT and tokenization, businesses are expected to develop more innovative and responsive marketing strategies in response to the preferences of digital consumers. A marketing strategy that leverages NFT's keunikan and kelangkaan can increase existing customers' loyalty and change their perception of the brand (Lee et al., 2023). The future of the digital economy will be greatly impacted by how businesses can integrate this technology in a way that is relevant and beneficial to customers.

3. RESEARCH DESIGN AND METHOD

This research employs a mixed-methods approach, combining both quantitative and qualitative analyses to explore how NFTs and tokenization affect consumer purchasing behavior in the Metaverse era. By utilizing both qualitative analysis and quantitative contextual analysis (Creswell et al. 2003), the study provides a comprehensive perspective. The study follows an explanatory sequential design, beginning with a detailed quantitative analysis followed by qualitative exploration, allowing researchers to delve deeper into findings that cannot be fully explained by numbers alone, offering additional context through qualitative reflections (Ivankova and Clark 2023). The population for this study includes active Metaverse users who participate in NFT transactions. To ensure a diverse representation across demographics, the study employs stratified random sampling for the quantitative phase, targeting 500 respondents based on statistical analysis (Hair, J.F., Celsi, M., Money, A.H., Samouel, P., & Page 2015; Hair Jr et al. 2021). Additionally, 20 participants are chosen purposefully for qualitative analysis, particularly those exhibiting unusual or standout purchasing behaviors as indicated by the quantitative results.

Quantitative data is collected through online surveys that assess perceptions of reality, trust, and NFT purchase timing using a 5-point Likert scale. The qualitative data is gathered through focus group discussions, where participants share their perceptions, motivations, and experiences with NFTs in the Metaverse. These interviews are transcribed, translated, and analyzed thematically (Braun

and Clarke 2021). A key innovation in this research is the integration of qualitative data analysis with machine learning-based text mining to examine user queries and discussions on Metaverse platforms. This method allows for the identification of subtle emotions and sentiments that have been overlooked in previous research (Yilmaz et al. 2023). The study also incorporates social network analysis (SNA) to understand how social interactions within the Metaverse shape consumer behavior, providing fresh insights into digital social dynamics (Scott 2024).

To assess the relationships between secondary variables and identify the main variables influencing purchase decisions, the study employs Partial Least Squares Structural Equation Modeling (PLS-SEM) using SmartPLS (Hair et al., 2020). Thematic analysis is combined with text mining techniques for qualitative data analysis, which helps evaluate user sentiments and emotions. Social network analysis (SNA) tracks interactions and identifies challenges within NFT user communities in the Metaverse. To ensure validity and reliability, the study uses data triangulation by comparing results from both quantitative and qualitative analyses. Construct validity is tested using Cronbach's alpha and Confirmatory Factor Analysis (CFA) (Hair et al., 2020). SNA results are validated by two experts, who employ a triangulation method to confirm the accuracy of the social interaction interpretations in the Metaverse. The research adheres to ethical research principles, ensuring the privacy and autonomy of respondents. Data collection and handling meet international standards for data encryption (Smith et al., 2021). This study aims to significantly contribute to the digital economy literature by presenting a novel conceptual model that integrates quantitative and qualitative analysis, offering insights into how social interactions shape consumer behavior in the digital economy. These findings will have implications for digital marketing strategies, policy formulation, and academic research on consumer behavior in the Metaverse era (Lee et al., 2023).

4. RESULT AND DISCUSSION

4.1. Quantitative Analysis Results

A quantitative analysis using Partial Least Squares Structural Equation Modeling (PLS-SEM) demonstrates that user experience, perceptions of the technology, and user confidence significantly affect consumers' perceptions of NFT in the Metaverse. The uji model's results show that the variable niat pembelian has an R2 of 0.68, indicating that the model can explain 68% of the variation in consumer niat. This presents a robust model that stabilizes the hypothesis of the study. The regression coefficient ($\beta = 0.45$, $p < 0.001$) is a strong predictor of purchase intent, suggesting that consumers become less eager to purchase NFT when they perceive high economic and emotional value from the aforementioned digital asset. Percepsimal keamanan dan transparansi yang ditawarkan oleh blockchain meningkatkan keyakinan konsumen dalam melakukan transaksi NFT, seperti kepercayaan terhadap teknologi blockchain ($\beta = 0.30$, $p < 0.01$). User experience ($\beta = 0.22$, $p < 0.05$) showed a moderate but significant decline, suggesting that user friendliness and ease of use of the Metaverse platform affect purchase decisions (Hair et al., 2020).

4.2. Qualitative Analysis Results

A qualitative analysis using wawancara reveals that the primary consumer motivation for purchasing NFT is unique digital capabilities and experiences. The paper presents an analysis of the limitations of NFT in providing a sense of ownership that cannot be replaced by conventional digital asets. In addition, a few respondents highlighted the importance of digital identities and communities that are strengthened by NFT possession, strengthening social interactions in the Metaverse (Braun & Clarke, 2022). The qualitative analysis also indicates that the most significant factor in adopting

NFT is the degree of clarity in understanding technology and the lack of regulatory compliance. A few participants expressed concerns about the volatility and penipuan of NFT, which negatively impacted their perception of risk and their willingness to buy. This highlights how important consumer education and clear regulations are to facilitating more extensive NFT use (Li et al., 2022).

4.3. Sentiment Analysis and Social Interaction

Sentiment analysis using the BERT model reveals that positive sentiment for NFT is typically associated with terms like "innovative," "cost-effective," and "exclusive," whereas negative sentiment is typically associated with terms like "mahal," "rumit," and "not very good." All of this undermines the quantitative results that indicate perceptions of truth and honesty are key factors in decision-making. Social network analysis (SNA) identifies users who have significant social influence in Metaverse communities as likely to promote NFT, which strengthens their social influence over other consumers' purchasing decisions. This indicates that in addition to individual factors, social dynamics also play a crucial role in the adoption of NFT, with "opinion leaders" having a significant impact on the decision-making process (Scott, 2020).

4.4. Discussion

The results of this study are consistent with previous literature that states that perceptions of reality and trust are the primary factors that hinder the adoption of new technologies (Smith et al., 2021). However, this study makes a valuable contribution by highlighting the importance of user experience and social dynamics in the Metaverse ecosystem, which has not been extensively explored in previous research. The first findings of this research focus on integrating sentiment analysis with social network analysis to better understand how consumer perception and social interactions affect consumer behavior in dynamic digital ecosystems. The observation that digital identities and communities maintain a significant influence on consumer preferences suggests that more attention should be paid to the development of user communities and their overall experience in the Metaverse (Lee et al., 2023). The practical implications of this research include the need for a strategy of communication that capitalizes on the emotional intelligence and length of the NFT, as well as the importance of creating an efficient and safe consumer education environment to increase trust. Businesses in the Metaverse sector also need to work on improving the social and gaming aspects of their platform in order to increase user engagement and shorten transaction times.

5. CONCLUSION

Based on the results obtained through data analysis using statistical tests, the researcher concludes that, in accordance with the objectives of this study: (1) The majority of employees at Dent Smile Dental Clinic in Jakarta experience burnout at a mild level; (2) The quality of life for most employees at Dent Smile Dental Clinic in Jakarta falls within the moderate category; (3) There is no significant relationship between the level of burnout and the quality of life of employees at Dent Smile Dental Clinic in Jakarta. Based on that, the recommendations from this study include the following: (1) Conduct similar research involving clinics with a larger number of employees to better represent a broader and more diverse population; (2) For future research development, it is advisable to use direct interviews instead of distributing questionnaires, as this approach allows respondents to better understand the questions presented.

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