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Potential of Metaverse as New Technology to Improve the Property Agency Practice

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Abstract

Metaverse technology is regarded as the new revolution of the internet. It is a digital world that allows users to create their own avatars to interact and socialise with others. The continued development of the metaverse will change the way houses are viewed and transacted in the future, improving real estate agents' marketing practices. This research aims to understand the awareness and perspectives of real estate agents about metaverse technology. Therefore, the first research objective is to investigate the level of awareness of metaverse technology among real estate agents in Malaysia. The second research objective is to examine the perceived benefits of adopting metaverse technology by real estate agents in Malaysia in the future. Questionnaires were distributed to real estate agents who work in Malaysia and are registered under the Board of Valuers, Appraisers, Estate Agents, and Property Managers. The collected data were analysed using frequency analysis, crosstabulation analysis, and mean score analysis. Overall, the findings show the level of awareness of metaverse technology among real estate agents in Malaysia and their perspectives on its adoption as part of their practices. Thus, this research can contribute to real estate agents, practitioners, firms, and researchers.

Keywords: Metaverse technology, agency practice, real estate agent, awareness, perspective

1.0 INTRODUCTION

Technologies make our lives more comfortable, easier, faster, and better. This also means that technology has gradually become an integral part of our lives, and people rely on it to enjoy a high quality of life. In the past few decades, technology has evolved continuously, with the development of information and communication technology (ICT) being one of the most significant advancements (Lanigan, 2009). With the advancement of various technological devices and the combined use of different devices, the interaction between people has become easier and more convenient (Huisman et al., 2012).

Furthermore, technology has caused tremendous changes in the real estate industry. The real estate industry has always been considered to be lagging behind other industries in terms of technology adoption (Warburton, 2016). However, it has undergone dramatic changes in recent years, particularly following the outbreak of COVID-19 in 2020. Kang (2021) pointed out that the outbreak of COVID-19 expedited the global transition towards a digital world, providing services that are not affected by the physical world and different circumstances. The social distancing and lockdown measures implemented by most countries during that time to control the spread of the disease changed the way people interact with each other (Oh et al., 2022). Since face-to-face activities were not allowed during the lockdown period (Park, 2021), the real estate industry was impacted by restrictions on personal contact with clients (Moro et al., 2022). This forced the real estate industry to accelerate digital transformation to face the challenges.

The primary job of a real estate agent is to assist clients in buying, selling, or renting properties, which traditionally requires face-to-face interactions. For instance, site inspections, property photography, and showing properties to clients. However, since the outbreak of COVID-19, the conventional marketing approach for real estate agents has slowly become irrelevant and incompatible with the current situation, being replaced by 360-degree photography and virtual tours (Zaidi et al., 2020). Additionally, as people pursue online services that mimic the real world (Park, 2021), the prevalence of non-face-to-face communication during the COVID-19 pandemic has indirectly driven the rise of various new technologies, especially metaverse technology (Lee, 2021). Furthermore, with the arrival of the era of the Fifth Industrial Revolution (IR5.0), the evolution of modern manufacturing processes allows collaborative work between humans and machines, combining the unique cognitive abilities of workers with the precise technical expertise of robots (George and George, 2020). This will drive the development of metaverse technology.

The term "Metaverse" comes from a 1992 novel by Neal Stephenson called *Snow Crash*. The novel describes the Metaverse as an immersive world where the character Hiro is not actually inside the world when logged into the Metaverse. He is in a computer-generated

world that his computer renders more realistically through his goggles and headset to make him feel like he's in the Metaverse (Snow Crash, 2021). According to Krasnokutsky (2022), the development of metaverse technology involves various technologies, such as Augmented Reality (AR) and Virtual Reality (VR), Artificial Intelligence (AI), Natural Language Processing (NLP), virtual assistant technology, computer vision, human pose estimation, Internet of Things (IoT), blockchain technology, and 3D modelling. Additionally, the metaverse is characterised as the new generation digital world, allowing people to own assets in the digital world just like in the physical world. The assets in the metaverse are called digital assets, and the tool used to represent the ownership of unique assets is Non-Fungible Tokens (NFT) (Nakavachara & Saengchote, 2022). Cryptocurrencies are expected to become the main tool for exchanging goods and services in the metaverse (Ashish & Kanika, 2022).

Aharon et al. (2022) stated that the utilisation of metaverse technology is not only in the gaming field but is also expected to be involved in various economic sectors such as healthcare, advertising, manufacturing, education, social commerce, and so on. Therefore, the metaverse holds immense potential as one of the technologies that can greatly drive the advancement of online services. With an increasing number of users and usage time, the metaverse may add various additional services such as advertising and item sales (Choi, 2022). According to Aharon et al. (2022), the metaverse economy reached a market size of USD 38.85 billion in 2021 and is expected to grow at a robust compound annual growth rate (CAGR) of 39.4% from 2022 to 2030. Additionally, Wiles (2022) stated that by 2026, 25% of people are expected to spend at least one hour a day in the metaverse for various purposes. The report of the Malaysia Digital Economy Corporation (MDEC) in 2022 mentioned that neighbouring countries are aware of the potential of metaverse technology and are actively developing it in their countries. For instance, Indonesia has launched its web3-based metaverse project "JAGAT," Thailand has chosen Phuket as the country's first Metaverse City, and Vietnam has set up a steering committee to research and develop 6G mobile technology. This shows that metaverse technology will be the next economic driver for the digital economy in the future.

In summary, it is believed that the emergence of metaverse technology will bring significant changes and advancements to the real estate industry, especially in the practices of real estate agents. The continued development of the metaverse will change the way houses are viewed and transacted in the future, improving the marketing practices of real estate agents.

■2.0 LITERATURE REVIEW

2.1 General Definition

The technology in the real estate industry can also be called property technology or proptech. According to the CBRE report (2020), technology and property have proven to be a successful combination, bringing efficiency and flexibility to the parties involved in the real estate industry. Real estate technologies such as drones, virtual reality, artificial intelligence, the Internet of Things, blockchain, etc., have been implemented to improve customer experiences, increase operational efficiencies, and boost sales (Siniak et al., 2020). Baum et al. (2020) stated that the implementation of various technologies in the real estate industry indicates that the industry is undergoing a digital transformation.

The Malaysian Estate Agency Standards Third Edition 2020 describe estate agency practice as representing oneself to the public, individual, or firm as ready to act for commission, fee, reward, or other considerations. This also includes services related to property sales or disposals, property purchase or acquisition, property leasing or letting, promoting the availability of properties for sale or disposal, purchase or acquisition, leasing or letting, as well as tenancy administration tasks such as rental collection, payment of expenses, coordinating minor repairs, and facilitating the transfer of property possession. In addition, agency practice in Malaysia must comply with the Valuers, Appraisers, Estate Agents, and Property Managers Act 1981 and be supervised by the Board of Valuers, Appraisers, Estate Agents, and Property Managers (BOVAEA). The job scope of a real estate agent includes buying, selling, and leasing properties; helping clients find available properties for sale; assisting clients in the negotiation process; property touring; and facilitating the property purchasing process.

The concept of the metaverse comes from the science fiction novel *Snow Crash*, written by Neal Stephenson in 1992. According to Kim (2021), the metaverse is a three-dimensional virtual world where people can inhabit and interact with other users through avatars. Since 2020, it has become one of the most popular terms in the tech world. Over the past few years, several events, such as COVID-19 and advancements in digital and immersive technologies, have restricted face-to-face communication, changing the way humans interact. This has promoted the development of the metaverse to satisfy the human need to socialise and communicate with others (Zallio and John Clarkson, 2022). Kye et al. (2021) have extended the explanation of the metaverse, describing it as a digital world created through smartphones, the internet, and other digital media.

2.2 Factors Contributing the Metaverse Adoption

i) New Experience

According to Doyle and Kim (2007), the experience of the metaverse is akin to that of earlier centuries' travellers who returned with information and curiosity from distant or previously undiscovered lands. Nowadays, network virtual environments are gradually becoming popular, starting with the emergence of Massively Multiplayer Online Games (MMOG) and then virtual worlds such as Second Life, which demonstrate that network virtual environments are interesting and novel (Zimmermann and Liang, 2008). However, the metaverse stands out as an immersive three-dimensional virtual world that allows users to interact with each other through avatars without any physical limitations, distinguishing it from traditional virtual interaction (Davis et al., 2009). The report by Deloitte Canada (2022) also stated that the metaverse can be defined as an online 3D virtual world, and its emergence will transform our way of life in the future. As the younger

generation is influenced by digital services, the new experiences brought by metaverse technology to digital services will affect its adoption (Lee and Gu, 2022). Lastly, Kashdan and Silvia (2009) mentioned that curiosity drives people to explore and experience new things.

ii) Increased Public Awareness and Knowledge

Increased public awareness and knowledge of the metaverse will affect its adoption by real estate agents. A survey conducted by Yue (2022) on the application of the metaverse in education in Shenzhen, China, showed that a significant proportion of people have limited knowledge and understanding of the concept of the metaverse. However, as many as 76.9% of the respondents had varying degrees of understanding of the metaverse. According to Lee's (2022) questionnaire on usage intentions and perceptions among non-engineering university students, 270 respondents, or 53.8% of the total 502 respondents, had never tried to use the metaverse but were willing to do so in the future. Moreover, Bonales-Daimiel et al.'s (2022) analysis of the use of the metaverse in Spain and Mexico showed that the majority of respondents in the survey were not familiar with the metaverse, but they had a certain degree of understanding of the equipment and technologies related to it. Additionally, as noted by Chinie et al. (2022), the awareness and knowledge of the metaverse in Romania are not very high. Their survey on the status of metaverse adoption in Romania revealed that only a few respondents (22.8%) had tried to use any of the metaverse platforms, and more than half of the respondents (76.8%) had not tried using any metaverse platforms. According to a survey conducted by Bale et al. (2022), the majority (57%) of respondents were excited about the metaverse concept, but it also found that up to 53% of respondents did not know what the metaverse was before attempting the survey.

iii) Advancement of Other Technologies and Digital Infrastructure

According to Krasnokutsky (2022), the metaverse is developed through the integration of various technologies such as Augmented Reality (AR), Virtual Reality (VR), Mixed Reality (MR), Artificial Intelligence (AI), Natural Language Processing (NLP), the Internet of Things (IoT), blockchain technology, 3D modelling, etc. According to Aloqaily et al. (2022), to achieve a real-world metaverse, all single entities, concepts, and operations must be involved in the created 3D environment. This also entails integrating data from the Internet of Things (IoT) and high-resolution videos to construct a complete metaverse environment. It requires the support of various technologies to realise the comprehensive and immersive metaverse experience. Aloqaily et al. (2022) mentioned that existing technologies and digital infrastructure are not yet capable of perfectly realising the virtual experience brought by the metaverse. However, with the advancement of next-generation networks such as 6G technology, communication, networking, and data transmission can enhance the experience of metaverse services and applications. Lowering the barriers to metaverse adoption will allow more people to meet the requirements and participate in the metaverse (Kalla et al., 2022).

iii) Increased Demand for Virtual Activities

The COVID-19 pandemic has increased the demand for virtual activities and promoted the adoption of the metaverse. Jeon (2021) mentioned that world culture has shifted to non-face-to-face interactions after the outbreak of COVID-19, and digital technology has made cultural diffusion possible, overcoming the limitations of space and time. According to Fu et al. (2022), the increased demand for virtual activities has boosted the adoption of the metaverse, providing a new type of social ecology that connects the physical world and virtual worlds. The report by Straits Research (2021) on the Global Virtual Events Market stated that the global market size for virtual events in 2021 was valued at USD 110.21 billion and is estimated to reach USD 617.33 billion by 2030, growing at a CAGR of 21.1% from 2022 to 2030. According to the report by Verified Market Research (2021) on the Global Virtual Events Market Size, the market size for virtual events in 2021 was USD 113.27 billion and is estimated to reach USD 592.91 billion by 2028, growing at a CAGR of 25.30% from 2021 to 2028.

2.3 Potential of Future Metaverse Technology Adoption in Property Agency Practices

i) Potential Economic Value

A series of recent studies have indicated the metaverse's enormous potential economic value as people's habits gradually shift from physical to online. A report by Meta (2022) explained that the metaverse provides a new economic opportunity due to the transformation in people's lifestyles. The McKinsey & Company (2022) report shows that as many as 59% of respondents prefer to carry out at least one activity in the metaverse, such as shopping, socialising, fitness, dating, and education, while the rest prefer all activities to remain physical. This indicates a consumer preference for conducting activities in a virtual world. According to Alsop (2022), data and forecasts for metaverse market revenue worldwide show that the global metaverse market size was estimated to reach USD 38.85 billion in 2021 and is forecasted to rise to USD 678.8 billion by 2030. Meanwhile, PwC data shows that the metaverse market size is expected to rise from USD 148.5 billion in 2021 to USD 1,542.9 billion in 2030. Additionally, Christensen and Robinson (2022) concluded in their study that the metaverse has the potential to make a significant contribution to the global Gross Domestic Product (GDP), with an estimated impact of up to 2.8% in the 10th year of its adoption. The Meta (2022) report also stated that, by observing the current situation, the economic contribution value of the global metaverse may exceed USD 3 trillion by 2031.

ii) Enhance the Experience of Virtual Activities

A growing body of studies has indicated that the adoption of the metaverse can enhance the experience of virtual activities and bring the virtual experience closer to the real world. According to Wu et al. (2022), their research explained how they adopted metaverse technology to develop a platform showcasing the traditional culture of the chime bells of Marquis Yi of Zeng, aiming to allow users to participate in the exhibition online. Users can also interact and share experiences with other users during the participation process, making them feel immersive even if they are in different locations. Moreover, 652 visitors participated in the survey, and the results show that most visitors reported feeling immersed in the virtual exhibition, feeling as if it were a real exhibition. Additionally, research carried out by Fan et al. (2022) found that metaverse technology adoption can contribute to the development of an immersive and comprehensive cultural tourism information service. By adopting the concept of the metaverse, it is possible to create an immersive experience of the cultural heritage of historical figures like Zhu Xi, allowing people to understand this heritage online even from different places and increasing the interest of the next generation in understanding cultural heritage.

iii) Increase Efficiency and Effectiveness

According to Al-Ghaili et al. (2022), the adoption of metaverse technology eliminates transportation charges and removes limitations on the number of users, players, trainees, learners, or individuals participating in virtual activities. Furthermore, almost all countries currently face the issue of population migration from rural to urban areas. This issue presents cities with challenges related to population density, human health, traffic congestion, emergency response, crime and safety, and environmental pollution. Research shows that the adoption of the metaverse can alleviate these challenges because it makes virtual activities more efficient and effective regardless of users' locations (Choi, 2022). Moreover, research by Sun-Yi and Kang (2023) highlighted that the outbreak of COVID-19 caused nursing students' practice to shift online, adopting metaverse technology for simulated practice. The results showed that nursing students who received simulation practice based on metaverse technology had significantly higher knowledge scores.

iv) New Business Opportunities and Investment

According to Periyasami and Aravin (2022), the metaverse creates a new business model by integrating various basic digital facilities and business platforms. The emergence of non-fungible tokens (NFTs) and blockchain technology enables marketing and advertising businesses to operate similarly to how they do in the real world. Furthermore, Jin et al. (2022) stated that, with the significant impact of the COVID-19 pandemic on the physical music performance industry, the metaverse has become an ideal stage for online concerts and music festivals, creating new business opportunities in the industry. Additionally, the COVID-19 pandemic's emergence has created new business opportunities in the travel industry and digital or virtual tourism. The metaverse allows people to explore different destinations, travel around the world, or even venture into space without leaving home (Zaman et al., 2022). Furthermore, according to Yu (2022), the metaverse has created new business opportunities for the online retail shopping experience, such as establishing Metamall. The establishment of Metamall integrates all retail into one place and allows retailers to lease or purchase virtual space to run their online businesses, similar to a real-world mall.

■3.0 METHODOLOGY

3.1 Data Sampling

The target respondents for this research are real estate agents currently working in Malaysia and registered under the BOVAEA. According to the BOVAEA, there were 6,811 active real estate agents (4,251 registered real estate agents and 2,560 probationary real estate agents in Malaysia as of 2024. It is important to note that this population does not include inactive registered and probationary real estate agents, and the data may not be up to date. Therefore, the population for this study was estimated to be 6,811. The sample size for this research was calculated using the Taro Yamane formula with a 90% confidence level and a 10% margin of error. The sample size was calculated as follows:

$$n = \frac{6{,}811}{1 + 6{,}811(0.1)^2}$$

$$n = 98.55$$

$$n \approx 100$$

In this research, the simple random sampling method was adopted, which falls under the category of probability sampling methods, to collect the data. The simple random sampling method allows researchers to obtain the desired sample size at a lower cost and in less time. Adopting this sampling method ensures that every real estate agent in the industry has an equal opportunity to participate in the questionnaire. Additionally, the simple random sampling method is the most suitable for data collection in this research due to constraints in terms of funding and time for the researcher.

Table 1 Research sampling method

Sampling Method	Simple Random Sampling Method (Probability Sampling Methods)
Population	Real Estate Agents (Registered under the BOVAEA & Employed by real estate agent firm) - Probationary - Registered
Sample Size	100 respondents

3.2 Data Collection Method

In this research, quantitative methods are employed to collect data through questionnaires administered to targeted respondents to measure the research objectives. Both primary and secondary data are utilised in the data collection process. Primary data is obtained through a questionnaire survey distributed to real estate agents. Secondary data is gathered from various sources, such as articles, journals, papers, seminars, technical reports, websites, newspapers, and books related to metaverse technology. This secondary data was collected and used during the literature review. The method chosen to distribute the questionnaire in this research was online, using the Google Forms platform. The finalised questionnaire was shared with targeted respondents through email, social media applications, and other channels. Below is the design of the questionnaire and the rating scale for multiple-choice and scaling questions:

Table 2 Design of questionnaire

Section	Title	Purpose	Question Type
A	Background of the respondent	To identify the demographic, qualification, experience, etc., of the respondents	Close-ended Questions
B	Level of awareness on themetaverse technology	To identify the level of awareness on the metaverse technology among thereal estate agents in Malaysia.	•Close-ended Questions •Multiple-choice Questions
C	Perspective on the future ofmetaverse technology adoption in Malaysia	To examine the perspective of real estate agents on the benefits of adopting metaverse in Malaysia.	Scaling Questions

Table 3 Design of rating scale

Type of Questions	Rating Scale	
Close-ended Questions	Not Sure/Maybe	1
	No/Dislike	2
	Yes/Like	3
	Not Sure	1
	Never heard of it	2
	Heard before but not aware of it	3
	Aware but never tried it	4
	Aware and tried it before	5
	Not Sure	1
	Very Unlikely/Unlikely	2
	Neutral	3
	Likely	4
	Very Likely	5
Multiple-choice Questions	Respondents select:	
	Not Sure/Haven't heard of it before	1
	1 – 2 options	2
	3 – 4 options	3
	5 – 6 options	4
	7 options and above	5
Scaling Questions	Strongly Disagree	1
	Disagree	2
	Neutral	3
	Agree	4
	Strongly Agree	5

3.3 Data Analysis

In this research, the data collected from distributed questionnaires were analysed using various techniques, including frequency analysis, cross-tabulation analysis, and mean score analysis. These data analysis methods explain the research results accurately and facilitate solving the research problem. The questionnaires collected from respondents were processed and analysed using the Statistical Package for the Social Sciences (SPSS) software.

Table 4 Data analysis method

Section	Title	Method of Analysis Data
A	Background of the respondent	Frequency Analysis
B	Level of awareness on the metaverse technology	Descriptive Analysis – Mean Score Analysis Descriptive Analysis – Cross-Tabulation Analysis
C	Perspective on the future of metaverse technology adoption in Malaysia	Descriptive Analysis – Mean Score Analysis

■4.0 FINDINGS AND DISCUSSION

A total of 100 questionnaires were sent to targeted respondents, and the researcher analysed all 100 received questionnaires. All the data collected from the questionnaires was analysed and discussed in detail to ensure that the research questions and objectives were addressed. The information obtained in the questionnaires was analysed using frequency analysis, cross-tabulation analysis, and mean score analysis.

4.1 Respondents' Demography

Frequency analysis was used to analyse the demographics of the respondents. The aim of this analysis was to obtain an overview of real estate agents in terms of gender, age, race, state/federal territories of work, level of education, employment status, professional status, and work experience.

Table 5 Respondents' demography

Demographic Variables	Categories	Frequency	Percent (%)
Gender	Female	40	40.0
	Male	**60**	**60.0**
Age	18 – 20 years old	14	14.0
	21 – 30 years old	**42**	**42.0**
	31 – 40 years old	29	29.0
	41 – 50 years old	10	10.0
	51 years old and above	5	5.0
Race	Bumiputera	2	2.0
	Chinese	**53**	**53.0**
	India	12	12.0
	Malay	33	33.0
State/Federal Territories of Work	Johor	21	21.0
	Kedah	2	2.0
	Kelantan	2	2.0
	Kuala Lumpur	14	14.0
	Labuan	1	1.0
	Melaka	6	6.0
	Negeri Sembilan	8	8.0
	Pahang	4	4.0
	Perak	6	6.0
	Perlis	2	2.0
	Pulau Pinang	9	9.0
	Putrajaya	1	1.0
	Sabah	3	3.0
	Sarawak	4	4.0
	Selangor	14	14.0
	Terengganu	3	3.0
Level of Education	Degree	39	39.0
	Diploma	34	34.0
	Doctoral	7	7.0

	Master	2	2.0
	SPM	11	11.0
	STPM	7	7.0
Employment Status	Employed Full-Time in Private Sector	45	45.0
	Employed Part-Time in Private Sector	35	35.0
	Self-employed	12	12.0
	Unemployed	8	8.0
Professional Status	Probationary Real Estate Agent	54	54.0
	Registered Real Estate Agent	46	46.0
Working Experience	0 – 5 years	42	42.0
	6 – 10 years	32	32.0
	11 – 15 years	14	14.0
	16 – 20 years	6	6.0
	21 years and above	6	6.0

It is evident from the demographic analysis data that the majority of respondents are young, work predominantly in cities, and have a high level of education. This demographic profile likely positively influences the research findings, as these respondents are generally tech-savvy and capable of comprehending the questionnaire questions accurately, thereby yielding more precise results.

4.2 Analysis of the Level of Awareness of Metaverse Technology among Real Estate Agents

Cross-tabulation analysis and mean score analysis were adopted in this section to explain the results of each question in the questionnaire collected from the respondents and to assess the level of awareness of metaverse technology among real estate agents in Malaysia. Through this analysis, the first research objective, which is to investigate the level of awareness of metaverse technology among real estate agents in Malaysia, has been addressed. The scales used to measure the level of awareness are as follows:

Table 6 The scale used to measure the level of awareness

Mean Score Range	Parallelity Level
0.00 – 1.00	No Awareness
1.01 - 2.50	Low Awareness
2.50 – 3.00	High Awareness

Mean Score Range	Parallelity Level
0.00 - 0.99	Very Low / No Awareness
1.00 - 1.99	Low Awareness
2.00 - 2.99	Moderate Awareness
3.00 - 3.99	High Awareness
4.00 - 5.00	Very High Awareness

4.3 Level of Awareness of Metaverse Technology among Real Estate Agents

The survey results indicate varying levels of awareness and involvement with metaverse technology among real estate agents (Table 7). A significant portion of respondents is aware of the metaverse (41%), with probationary real estate agents slightly more knowledgeable than registered real estate agents. Awareness of metaverse-related equipment and technologies is moderate, with most respondents familiar with 3-4 options (69% for equipment and 32% for technologies). Initial awareness is low, with 59% unsure. Familiarity with the metaverse and its platforms is limited, with a substantial number of respondents either not sure (32% for metaverse, 64% for platforms) or never having heard of it (27%). Involvement in metaverse platforms is minimal, with only 3% of respondents participating, and a majority not involved (69%). Overall, while there is some awareness, active engagement with metaverse technology remains low among real estate agents.

Table 7 Respondents' level of awareness of metaverse technology

Item	Rating Scale	Probationary Real Estate Agent	Registered Real Estate Agent	Total (%)
Awareness of Metaverse	Not Sure	20	13	33
	No	10	16	26
	Yes	24	17	41
Awareness of Metaverse-Related Equipment	Not Sure	0	0	0
	1 – 2 options	3	1	4
	3 – 4 options	38	31	69
	5 – 6 options	3	7	10
	7 options and above	10	7	17
Awareness of Metaverse-Related Technologies	Not Sure	0	1	1
	1 – 2 options	0	1	1
	3 – 4 options	2	3	5
	5 – 6 options	17	15	32
	7 options and above	35	26	61
Rating of Initial Awareness	Not Sure	30	29	59
	1 – 2 options	1	0	1
	3 – 4 options	16	7	23
	5 – 6 options	7	8	15
	7 options and above	0	2	2
Familiarity with Metaverse	Not Sure	20	12	32
	Never heard of it	10	17	27
	Heard before but was not aware of it	13	9	22
	Aware but never tried it	11	5	16
	Aware and tried it before	0	3	3
Familiarity with the Metaverse Platforms	Not Sure	31	33	64
	1 – 2 options	8	1	9
	3 – 4 options	6	4	10
	5 – 6 options	5	5	10
	7 options and above	4	3	7
Involvement in Metaverse Platforms	Not Sure	19	9	28
	No	35	34	69
	Yes	0	3	3

The descriptive statistics in Table 8 reveal that respondents exhibit a very high level of awareness regarding metaverse-related technologies, with a mean score of 4.51. Awareness of metaverse-related equipment is also relatively high, with a mean score of 3.40. However, familiarity with the metaverse itself is moderate (mean score of 2.31), as is general awareness of the metaverse (mean score of 2.08). Initial awareness ratings are moderate as well, with a mean score of 2.00. Familiarity with specific metaverse platforms is low, with a mean score of 1.87, and involvement in these platforms is low, with a mean score of 1.75. Overall, while there is significant awareness of the technologies and equipment related to the metaverse, familiarity and active involvement with the metaverse and its platforms remain limited.

Table 8 Mean score analysis for the level of awareness of metaverse technology among the respondents

Descriptive Statistics					
Item	**N**	**Minimum**	**Maximum**	**Mean Score**	**Level of Awareness**
Awareness of Metaverse-Related Technologies	100	1	5	4.51	Very High Awareness
Awareness of Metaverse-Related Equipment	100	1	5	3.40	High Awareness
Familiarity with Metaverse	100	1	5	2.31	Moderate Awareness
Awareness of Metaverse	100	1	3	2.08	Moderate Awareness
Rating of Initial Awareness	100	1	5	2.00	Moderate Awareness
Rating of Familiarity with Metaverse Platforms	100	1	5	1.87	Low Awareness
Involvement in MetaversePlatforms	100	1	3	1.75	Low Awareness

To summarise the analysis from the preceding sections, a comprehensive conclusion can be drawn based on the cross-tabulation analysis, indicating that there are still many real estate agents in Malaysia who are unaware of or have a low level of awareness of metaverse technology, particularly among registered agents. However, probationary real estate agents demonstrate a relatively higher awareness of metaverse technology compared to registered agents. Moreover, the majority of real estate agents are aware of metaverse technology but have not yet experienced it. This suggests that while they understand what metaverse technology is and how it works, they have not had the opportunity to try it themselves. Based on the mean score analysis, most real estate agents in Malaysia exhibit low to moderate awareness of metaverse technology, but they show high awareness of the equipment and technologies associated with it. Therefore, although their awareness of metaverse technology is considered low, it is evident that metaverse technology is gradually becoming integrated into their daily lives, which may lead to increased awareness in the future.

4.4 Future Metaverse Technology Adoption by Real Estate Agents

This section discusses the future adoption of metaverse technology by real estate agents in Malaysia. Mean score analysis was employed to illustrate the respondents' perspectives on adopting metaverse technology in their agency practices. This analysis aimed to identify which benefits of metaverse technology real estate agents perceive as most likely to enhance agency practices if they adopt metaverse technology in the future. This section addresses the second research objective, which is to examine the perceived benefits of adopting metaverse technology by real estate agents in Malaysia in the future.

4.4.1 Respondents' Perspective on the Benefits of Adopting Metaverse Technology in the Future

Table 9 Ranking of respondents' perspectives on the benefits of adopting metaverse technology in the future

Perspective on the Benefits of Adopting Metaverse Technology in Malaysia in the Future	Position	Mean Score
New Business Opportunities	1	4.15
Potential Economic Value	2	4.10
Drive the Development of The Real Estate Sector	3	4.08
Alleviate the Problem of Traffic Congestion	3	4.08
New Experience in Showing Property	4	3.99
Improve Competitiveness	5	3.96
Enhance the Experience of Virtual Housing Viewing	6	3.84
Improve the Real Estate Agent Productivity	7	3.82
More Efficient and Effective	8	3.76
Convenient for the Real Estate Agents and Clients	9	3.58

In summary, based on the questionnaire responses collected, it can be concluded that most respondents believe the adoption of metaverse technology by real estate agents in the future will benefit agency practices. The top five perceived benefits are as follows: "New Business Opportunities" ranked first, "Potential Economic Value" ranked second, "Driving the Development of the Real Estate Sector" and "Alleviating the Problem of Traffic Congestion" tied for third place, "New Experience in Showing Properties" ranked fourth, and "Improving Competitiveness" ranked fifth. Conversely, "Convenient for Real Estate Agents and Clients" was perceived as the least significant benefit compared to the others. Therefore, the second research objective, which aimed to examine the perceived benefits of adopting metaverse technology by real estate agents in Malaysia in the future, has been successfully addressed. The majority of respondents agreed with all the listed benefits of future metaverse technology adoption in the questionnaire.

■5.0 CONCLUSION

In conclusion, this research successfully achieved the two research objectives established at the preliminary stage using quantitative methods and a literature review. Consequently, it has contributed additional knowledge to the existing body of literature on metaverse technology. The findings revealed that real estate agents in Malaysia have moderate to low awareness of metaverse technology, particularly among registered agents, but they exhibit high awareness of metaverse-related equipment and technologies. This indicates that metaverse technology is gradually integrating into their daily lives, which may lead to increased awareness in the future. Additionally, the study demonstrated that adopting metaverse technology by real estate agents will bring several benefits to agency practices, including "New Business Opportunities," "Potential Economic Value," "Driving the Development of the Real Estate Sector," "Alleviating Traffic Congestion," "New Experience in Showing Properties," and "Improving Competitiveness." However, "Convenient for Real Estate Agents and Clients" was perceived as the least impactful benefit among those listed. In short, research on metaverse technology from the perspective of real estate agents is still in its nascent stages. Therefore, future researchers are encouraged to expand this study to further strengthen the understanding of metaverse technology development in the real estate industry and to provide more substantial insights in the future.

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