INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN BUSINESS & SOCIAL SCIENCES

14, Issue 12, (2024) E-ISSN: 2222-6990

Virtual Shopping Expectation in the Metaverse Environment among Malaysian Retail Consumers

[1]Puteri Aina Megat, [2]Praveeneetaa Thevi Sattananttan, [3]Saraswathy Krishnamurti, and [4]Mazen Mohammed Farea

[1,2,3] Faculty of Business, UNITAR International University, Malaysia, [4]Faculty of Finance and Administrative Sciences, Al-Madinah International University, Malaysia

Corresponding Author Email: puteriaina@unitar.my, puteriaina.megat@gmail.com

To Link this Article: http://dx.doi.org/10.6007/IJARBSS/v14-i12/23611 DOI:10.6007/IJARBSS/v14-i12/23611

Published Date: 17 December 2024

Abstract

In Malaysia, the metaverse concept is still in its infancy with only a few local companies exploring the potential of metaverse environment with a slow progression of the public adoption. This study aims to investigate the receptiveness of retail consumers towards virtual shopping in the metaverse environment. Several behavioural theories are examined to understand the metaverse factors influencing the online consumption. The research applies a quantitative method with a cross-sectional survey design using a five-point Likert scale questionnaire. The study focuses on samples of 396 respondents from various demographic levels among online shoppers in Malaysia. Simple random sampling technique is used to identify the samples, and the data collected were analysed using SPSS software. The study reveals Product Interest, Interactive Virtual platforms, and Real-Time Simulations as significant key drivers in fostering acceptance of virtual shopping in a metaverse environment. However, Device Compatibility appears to be the least positive significant factor among the rest in engaging consumers towards metaverse virtual shopping. The results of the analysis may have important practical ramifications for practitioners looking to use virtual technologies to transform retail, as well as for those creating and designing metaverse platforms. Being highest correlation between Virtual Shopping and Interactive Virtual Platform, it suggests that, executing efficient virtual shopping platforms plays an important role in influencing consumers while purchasing virtually. The study reveals its potential to make practical contributions to benefit the retail business industry by leveraging consumer engagement and shopping experience to align with the growth in the digital era.

Keywords: Virtual Shopping, Metaverse, Product Interest, Interactive Virtual platforms, Real-Time Simulations, Device Compatibility

Introduction

The emergence of metaverse technology signifies a paradigm shift in retail business, primarily transforming how consumers relate to the products and brands. As worldwide trading evolves beyond traditional e-commerce, Malaysia's retail sector stands at a critical turning point. With an estimated global metaverse market value exceeding $800 billion by 2028, understanding Malaysian consumers' expectations becomes crucial for ensuring the nation's retail competitiveness in this revolutionary digital landscape (Singhal, 2024).

Metaverse is a concept of an immersive virtual world where users can benefit from engaging in various activities including shopping and has garnered attention among many users. The scenario has transformed from brick-and-mortar days to the metaverse era, driving the potential to extend the digital world using augmented reality (AR), virtual reality (VR), and mixed reality (MR) technologies allowing social connection among users by seamlessly interacting within real and simulated environments (Cheng et al., 2022).

The integration of metaverse technology with e-commerce represents a revolutionary transformation in how consumers interact with product offerings (Santosh, 2024). Global lifestyle brands, including Nike and Louis Vuitton, have recognized the strategic potential of metaverse retailing, incorporating it into their media campaigns and branded events (Kulkarni, 2023). In the Malaysian context, government initiatives through the Malaysian Digital Economy Corporate (MDEC) are actively encouraging local businesses to embrace metaverse opportunities. This digital landscape presents Malaysian retailers with unique opportunities to strengthen their brand value proposition through community building and enhanced customer engagement within the metaverse environment. However, Malaysian businesses and consumers exhibit hesitancy towards metaverse adoption, particularly concerning resource allocation and technological implementation (Sabrina et al., 2024).

Despite the promising prospects of this digital evolution, consumer sentiment remains diverse and complex. Malaysian consumers demonstrate varying levels of receptivity towards the metaverse concept, ranging from enthusiasm and curiosity to unfamiliarity and skepticism. This heterogeneous response pattern highlights the need for comprehensive understanding of consumer expectations and barriers to adoption in the Malaysian retail context (Sabrina, 2024; Pratt, 2022). Consumers generally are overly concerned about assurance to their sensitive information from getting misused or exploited without their consent (Byram, 2021). Therefore, it is important to balance any digital transformative capabilities with ethical considerations concerning consumer’s personal freedoms to avoid potential hacking and cybercrimes (Marr, 2022). Following that, to have the ultimate experience of a VR and AR environment, compatible devices having considerable computing power as a pre-requisite engine to run the content are deemed as necessary, this includes personal computers, consoles, or smartphones. Another key challenge includes wearable devices, for example VR headsets are believed to be uncomfortable. In addition, all these high-technology requirements are sold at a pricey cost (Byram, 2021). It serves no purpose if consumers are keen on metaverse shopping but are not able to supplement their interest with required technology devices.

Based on the study conducted by Ernst and Young (EY), 25% of consumers are expected to spend a minimum of an hour a day on the metaverse by 2026 (Peterson, 2022).

The same study also mentioned that Gen Alpha consumers have already started to socialize with their friends through online multiplayer games such as Roblox and Fortnite. This preference for a VR or AR reality setting indicates that consumers in today's era are open to the idea of experiencing immersive shopping that they never had before. However, it is worth noting that many of the consumers are still not fully aware of the concept of the metaverse (Yoo et al., 2023).

Therefore, this study aims to examine the receptiveness of Malaysian retail consumers towards virtual shopping in the metaverse environment. The specific objectives are to investigate the influence of consumers responsiveness in the areas of Product Interest, Interactive Virtual platforms, Real-Time Simulations and device compatibility as significant key drivers in fostering acceptance of virtual shopping in a metaverse environment. Consumers in Klang Valley are targeted for this study as it is classified as the heartland of Malaysia's industry & commerce (Jahir et al., 2023) and therefore, would be an ideal sub-set representation of Malaysia for this study.

The significance of this study is to demonstrate to businesses, policymakers, and academics how to effectively utilize metaverse virtual platforms. By understanding consumer behavior and retail experiences in the metaverse, Malaysian retailers can potentially expand their global reach through these virtual platforms. The framework proposed in this study could guide Malaysian policymakers, particularly through MDEC, in developing guidelines for metaverse digital platforms that enhance online shopping engagement. Additionally, implementing the procedures outlined in this study could boost consumer spending and generate new revenue streams through virtual products and experiences.

Literature Review

Consumer behaviors in today's era are evolving towards the digital realm whereby they are finding it easier to interact with product brands through online platforms and to make purchases in the same platform (Yoo et al., 2023). Aligned with that, firms' investments in digital platforms are seeing an increasing trend (Holmes, 2021). "Metaverse" is deemed as a promising digital platform having the potential to transform businesses, social life, and consumer behaviors (Kaur, 2024). The metaverse is a combination of the prefix "meta" which means transcendence while the suffix "verse" means the shorthand for the universe. It is basically a computer-aided internet-generated world with a consistent value system and an independent system linked to the physical world (Wang et al., 2022).

The metaverse environment in today's era has greatly transformed online shopping to an immersive virtual shopping experience that has garnered attention among the consumers. This promising evolution has extended the potential of the digital world by adopting technologies in allowing social connection among consumers by leveraging simulated environments (Cheng et al., 2022). Consumers are now no longer depended on other consumer's reviews to evaluate the quality of a product as practiced in the environment of a typical online shopping platforms. Instead metaverse environment is enriched with heightened sensory feelings i.e., heating, vision, touch, or even smell in some cases which is an innovative way, brings the physical stores to anywhere that the consumer prefers (Byram, 2021). This study examines the virtual shopping expectations of retail consumers in the

domains of product interest, interactive virtual shopping, real-time simulations and device compatibility using two critical underpinning theories.

Firstly, the Stimulus-Organism-Response Model (S-O-R) is a framework for understanding consumer behavior in virtual shopping environments (Jiang & Stylos, 2021). It suggests that stimuli, such as website design, product information, and promotional offers, interact with the consumer's internal state, influencing their behavior and decision-making (Han et al., 2023). Understanding the S-O-R model in virtual shopping based on figure 1 allows retailers to optimize the shopping experience by strategically designing stimuli to evoke desired responses. Personalized recommendations, interactive product demonstrations, and user-generated reviews can also influence the consumer's internal state, leading to more favorable responses, thereby enhancing their ability to create compelling virtual shopping experiences (Kim et al., 2018).

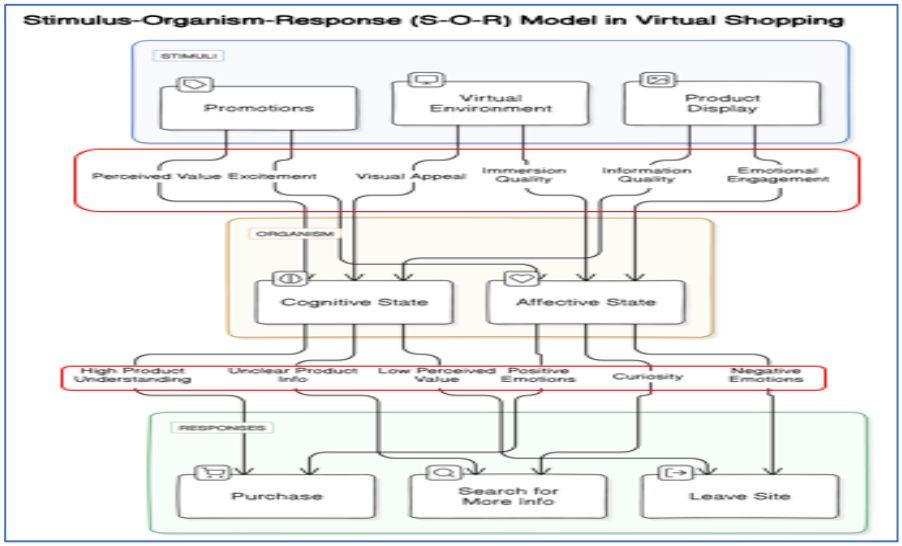

Figure 1: Stimulus-Organism-Response Model
(Jiang & Stylos, 2021)

Secondly, the Unified Theory of Acceptance and Use of Technology (UTAUT) which helps businesses understand consumer behavior towards technology adoption. It is particularly useful in the context of virtual shopping, where factors such as convenience, price comparison, and a wide range of options can influence consumer acceptance and use. Social influence, such as social media, peer recommendations, and online reviews, also plays a significant role in shaping consumer decisions and attitudes toward online shopping experiences (Thu Luong et al., 2021). The UTAUT model also considers facilitating conditions and behavioral intention, providing insights into factors driving individuals to embrace virtual shopping and external conditions that support its adoption (Thu Luong et al., 2021). In the context of virtual shopping, this could encompass the convenience of browsing and purchasing products from the comfort of one's own home, as well as the ease of comparing prices and exploring a wide range of options without the constraints of physical store locations (Erjavec & Manfreda, 2022). By examining the UTAUT framework in virtual shopping, businesses can develop more effective strategies to enhance the online shopping experience and increase customer acceptance and usage (Xi et al., 2024).

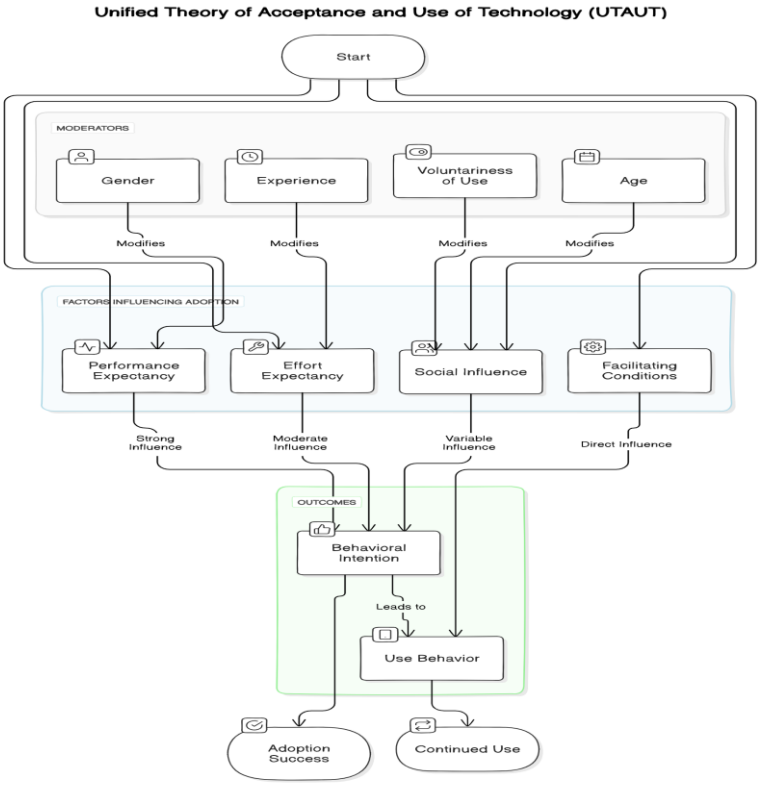

Figure 2: Unified Theory of Acceptance and Use of Technology Model
(Thu Luong et al., 2021)

This research addresses three critical gaps within the areas of industry, academic and policy frameworks, in relation to contemporary online shopping challenges particularly in metaverse environments. The industrial gap is particularly pronounced in Malaysia, where metaverse adoption remains in its infancy, with only a handful of local companies exploring this space (Sabrina, 2024). Despite the metaverse's potential for increasing business profitability, KPMG's 2023 survey indicates insufficient success metrics to justify substantial corporate investment (Chiang, 2023).

The academic gap reflects on the state of metaverse e-commerce research and its association with other technologies (Hussain, 2023). Traditional frameworks may not adequately address the evolving nature of consumer behavior and attitudes in metaverse shopping environments. The lack of comprehensive studies contributes to user unfamiliarity, potentially leading to negative experiences in metaverse environments (Habil et al., 2023).

The policy gap stems from limited regulatory executions on metaverse shopping concepts, which are rooted in complex technical studies. This is evidenced by recent research showing limited digital enforcement due to 77% of participants have never experienced augmented reality (Lavoye et al., 2023). While technology continues to shape marketplaces, the extent of regulatory policy establishment on e-commerce is still limited due to the unclearness of society's transition from the industrial age to a technology-driven era (Ng & Ramasamy, 2018).

To address these gaps, this study is conducted to investigate the virtual shopping expectations on the product interest, interactive virtual shopping, real-time simulations and device compatibility of retail consumers as follows:

Product Interest in Metaverse Virtual Shopping

The surge in interest among retail consumers is particularly notable in terms of consumer satisfaction within the metaverse, specifically within the context of products that interest the consumers. Nike, Puma, Gap, Clarks are examples of retail brands who have launched fantasy-based virtual experiences inside Roblox by introducing branded pictorial representation (avatar) skins and minigames (Silberstein, 2022). Past research has indicated interaction effects of personalized content and avatar reinforcing consumer satisfaction. Metaverse environment may open the door to a new shopping experience. The claim is also further supported by large international retail giants such as IKEA adopting to VR kitchen, Amazon adopting to AR/VR applications and Walmart adopting to AR scanner. The move towards technology-based innovative business has attracted consumers of those having an interest in such remarkable brands to explore this unique experience in the metaverse environment (Xi et al., 2024). The findings from the literature suggest the hypothesis below:

H1: Product Interest (PI) has a significant effect on virtual shopping on the Metaverse platform among Malaysian retail consumers

Interactive Virtual Platform in Metaverse Virtual Shopping

Byram (2021) claims that consumers experience exceptional satisfaction when a digital service provider offers ease of use in an innovative 3D web store platform. The metaverse in the retail industry aids the customer in observing around the store with a complete 360-degree view having the controller to help with the navigation in all directions following the view of the consumer's choice. Consumers can make an informed decision, by gaining the confidence prior making a purchase. A consumer can not only virtually walk anywhere in the virtual store, but also is able to interact with the virtual reality store by scrolling up, down, right and left to a get complete view of a product (Byram, 2021). Other research further supported this claim denoting that metaverse can replicate the similar experience and perception as physical store bridging the difference between the real and the virtual world (Xi et al., 2024).

Additionally, (Yoo et al., 2023) further lifted the claim by indicating the ability of metaverse to provide close to realistic experiences has shown a positive effect on consumer engagement and such unique shopping experiences led to a repurchase intention as well as lessened product return possibilities. The hypothesis below is generated from the literature:

H2: Interactive Virtual Platform (IVP) has a significant effect on virtual shopping on the Metaverse platform among Malaysian retail consumers.

Real-time Simulations in Metaverse Virtual Shopping

Real-time simulations are computer-generated system in a 3D environment where it has the absolute capability to create a simulated artificial world by leveraging and enhancing sensory feeling. This includes heating, vision, touch, and even smell in some cases (Byram, 2021). Metaverse elements that comprise Augmented Reality (AR), Virtual Reality (VR), and

Mixed Reality (MR) technologies redefined the online shopping to allow the creation of an immersive experience where the illusions from the variation in the motions imitate the physical stores that is applicable at any point of time and location that the consumer prefers i.e., personal computer at home, mobile devices or kiosks in stores (Khan et al., 2022).

Other research highlighted that the COVID-19 pandemic has strengthened the importance of AR by serving as a bridge between the physical and the digital world. This is further supported by a study indicating that AR adoption via mobile usage is expected to hit 75% of the global population by 2025 as almost all smartphone users will be the targeted as frequent AR users (Deloitte, 2022). This context illustrates that 3D online shopping enhanced with AR or VR elements are expected to see an increase in consumer exceptional shopping experience as it provides seamless interaction with touch and feel effects to users even post the pandemic (Fallon, 2022). The literature arguments suggest the hypothesis below:

H3: Real-time simulation (RTS) has a significant effect on virtual shopping on the Metaverse platform among Malaysian retail consumers.

Device Compatibility in Metaverse Virtual Shopping

Metaverse platforms require specialized hardware and software specifications to enjoy an exceptional experience. The degree of immersive experience is typically driven by the underlying media technologies of the system in which the extent of the experiences varies based on the level of virtuality (Yoo et al., 2023). Given that the commands for interactive 3D environments heavily rely on technology, considerable computing power is indeed necessary (Byram, 2021). Besides, for the best VR experience, wearable devices such as headset plays a crucial role in replicating real-world elements for instance, in most cases, the use of AR requires a device with a screen and camera or wearables such as Microsoft's HoloLens glasses (Microsoft, 2022).

However, Yoo et al. (2023) argued that the usage of such “hype” technologies for creating the immersive metaverse has also raised concerns among consumers that the additional VR modalities can impact the shopping experience in terms of comfort, usability and responsiveness which could limit the accessibility for shoppers for not being able to optimize the platform. Failing to cope with the required navigation approach could result in dissatisfaction and frustration and hinder urge to explore the metaverse environment. Besides, there are still also critics claiming that VR wearable devices are costly and thus, limiting the interest of retails consumers to explore the metaverse environment (Dwivedi et al., 2022). Thus, the hypothesis below is built from the literature:

H4: Device compatibility (DC) has a significant effect on virtual shopping on the Metaverse platform amongMalaysian retail consumers.

The research framework shown in Figure 3 is formulated based on the literature review findings and the hypothesis development.

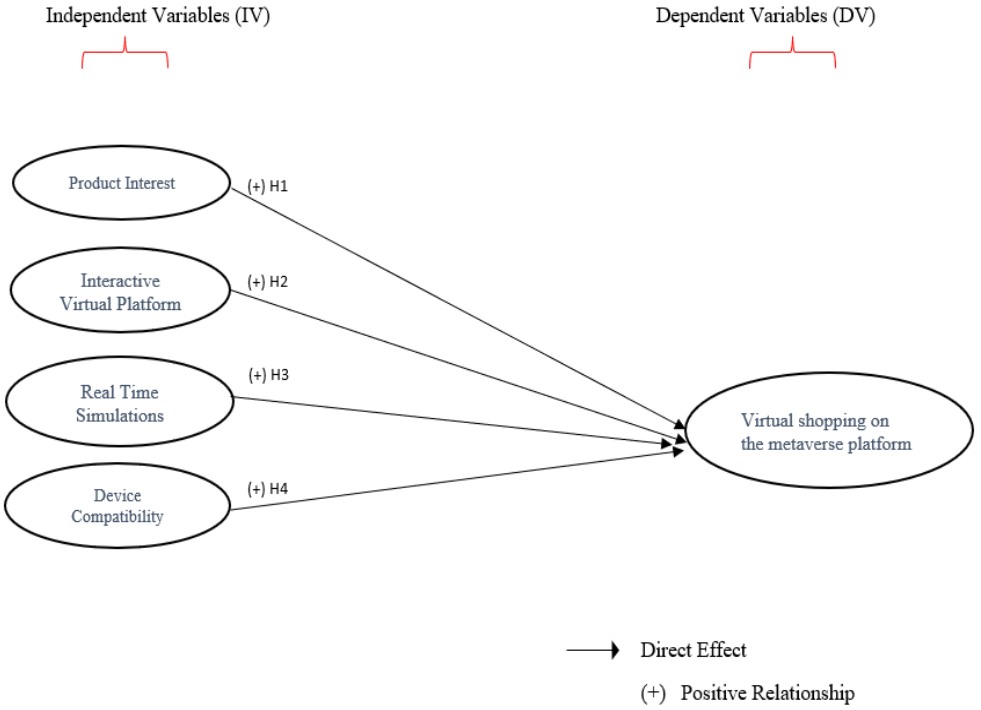

Figure 3: Research Framework (Source: Created by Authors)

Methodology

Quantitative data is chosen to address the research problem in this study. The source of data for this research is obtained through questionnaires which are distributed via google form (Taherdoost, 2022). The questionnaires for this research consist of demographic profile of the respondents (Gender, Location, Age, Education level and Monthly Income) and continued by questions addressing the dependant variable which consists of 5 questions and addressing the 4 independent variables which consists of 17 questions. Five options on a Likert scale, from 1 (strongly disagree) to 5 (strongly agree), are shown to respondents. The set of e-questionnaires was distributed via Google Form to the targeted sample group. The link to the designated Google Form is sent to potential respondents through social media platforms like WhatsApp for a greater reach.

This study has targeted consumers in Klang Valley Malaysia, covering Kuala Lumpur and its surrounding suburbs along with adjoining cities in the state of Selangor. Klang Valley is classified as the heartland of Malaysia's industry & commerce (Commission Factory, 2023) and therefore, would be an ideal sub-set representation of Malaysia that highly contributes to this study. In this study, a simple random sampling technique is selected. as it involves selecting only participants who are readily accessible and are randomly selected subsets of a population. The sample size for this study is 384 respondents, referenced with a table introduced by Krejcie and Morgan (1970). Considering the possibility of getting incomplete responses, the questionnaires distribution was not limited to 384 participants but were distributed to approximately 500 participants given the substantial risk involved.

A pilot test for this research is carried out with smaller sample sizes to test the reliability and validity of the instrument. analysis using IBM’s Statistical Package for the Social

Sciences (SPSS) is conducted on the collected data to generate valuable insights for this research and support the findings of the literature review. The results of the pilot test using reliability analysis indicate consistency of the instrument with the Cronbach alpha above 0,7 for all the variables. Subsequent Statistics will transform the quantitative data into information which will be helpful for decision-making (Taber, 2018; Sekaran & Bougie, 2016).

Results

Frequency measurement is adapted to determine the respective respondents' background which serves as a fundamental for descriptive statistics. The respondent's profile attributes have been classified based on the analytical data gathered comprising gender, age, education level, monthly income, and metaverse experience. The conclusion is derived following the attributes. Table 1 illustrates the details of the respondents' profiles.

Table 1
Summary of Demographic Attributes (N=396)

Variables	Options	Frequency	Percentage
Gender	Male	192	48.5
	Female	204	51.5
Age	Above 45	89	22.5
	35 – 44	114	28.8
	25 – 34	139	35.1
	18 – 24	54	13.6
Education	Master Degree	80	20.7
	Bachelor Degree	195	49.2
	Diploma	85	21.5
	Secondary School	34	8.6
Monthly Income	Above RM 8,001.00	22	5.6
	RM 5,001 – RM8,000	159	40.2
	RM 3,001 – RM5,000	145	36.6
	Below RM 3,000	70	17.7
Tried the shared link to experience virtual shopping in the metaverse environment.	Yes	375	94.7
	No	21	5.3

(Source: Created by Authors)

The reliability analysis is conducted in this study is to ensure that the instruments used in the questionnaire are internally consistent. Cronbach's alpha values vary from 0 to 1. Taber (2018) suggested a Cronbach's alpha of at least 0.7 is classified as reliable. As illustrated in table 2, all the variables' values fall above the alpha coefficient benchmark value of 0.7 in which can be classified as a high reliable data.

Table 2
Reliability Analysis – All Variables

Variables	Mean	Standard Deviation	Cronbach's Alpha	Number of respondents
Virtual Shopping (VS)			0.759	396
VS1 - Desire to try	3.9747	0.65167		
VS2 - Interesting features	3.8409	0.51552		
VS3 - Preference over traditional shoppi	4.1717	0.83336		
VS4 - Satisfaction	3.9444	0.42330		
VS5 - Purchase expectation	4.0707	0.55580		
Product Interest (PI)			0.733	396
PI1 -Limited product engagement	4.3611	0.62310		
PI2 - Product visualization	3.9975	0.66561		
PI3 - Product interest	3.7500	0.75347		
PI4 - Product information	3.4773	0.63004		
Interactive Virtual Platform (IVP)			0.741	396
IVP1 - Control of the content	4.5934	0.69272		
IVP2 - Navigation	3.9798	0.43236		
IVP3 - Enquiry response	4.7045	0.66071		
IVP4 - Interesting experience	3.9722	0.61766		
Real-time Simulation (RTS)			0.774	396
RTS1 - Interesting real-time response	4.0909	0.50498		
RTS2 - Seamless transition	3.9394	0.41657		
RTS3 - Inventory availability	3.3283	0.58962		
RTS4 - Eased navigation	4.6162	0.62370		
RTS5 - Enhanced engagement	3.9798	0.39567		
Device Compatibility (DC)			0.812	396
DC1 - Device impact	3.9520	0.69005		
DC2 - Feeling	4.0278	0.91222		
DC3 - Desire to try new application	4.0909	0.53421		
DC4 - Metaverse technology application	4.4116	0.67862		

(Source: Created by Authors)

One of the key points in many statistical analyses is the requirement to examine the data to be normally distributed. This research has adopted skewness and kurtosis assessment, and normal pp plot to conduct the normality test. According to (Demir, 2022).), the recommended threshold acceptance of skewness falls between -2 and +2 while kurtosis falls between -7 and +7. Table 3 illustrates the variables' values for both skewness and kurtosis. The reading, as tabulated, is within the predetermined thresholds, indicating the research has a normal distribution

Table 3
Descriptive Analysis

Descriptive Statistics

	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
Virtual_Shopping	396	-1.439	.123	5.722	.245
Product_Interest	396	-.125	.123	.259	.245
Interactive_Virtual_Platform	396	-2.282	.123	5.678	.245
Real_time_simulation	396	-.901	.123	5.834	.245
Device_Compatibility	396	-.498	.123	.491	.245
Valid N (listwise)	396				

(Source: IBM's Statistical Package for the Social Sciences (SPSS) version 27)

P-P plot is generated from SPSS to determine whether the data set is distributed normally or not. The P-P plot shows that the data set for dependent variable, which is Virtual Shopping is approximately normally distributed. As for the independent variable which consists of Product Interest, Interactive Virtual Platform, Real-time Simulation and Device Compatibility, the data set are also distributed normally as the P-P plot shows a strong linear pattern. All the P-P plot shows minimal deviations from the line fit to the points.

A linear relationship between two randomly and normally distributed variables is measured by a Pearson correlation. The relationship grows stronger and eventually moves in a straight line for Pearson correlation as the coefficient approaches an absolute value of 1 (Schober et al., 2018). In this research we chose Pearson correlation as the data are normally distributed.

Table 5 describes the results and the level of correlation. With the dependent variable being virtual shopping, the correlation of the independent variables are as follows; Product Interest (r=0.631), Interactive Virtual Platform (r=0.725) and Real- time Simulation (r=0.661). These independent variables show fairly strong positive correlation level. However, Device Compatibility (r=0.309), which only shows a weak positive correlation.

Table 5
Pearson's Correlation Test Results

Correlations

		Virtual_Shopping	Product_Interest	Interactive_Virtual_Platform	Real_time_simulation	Device_Compatibility
Virtual_Shopping	Pearson Correlation	1	.631**	.725**	.661**	.309**
	Sig. (2-tailed)		<.001	<.001	<.001	<.001
	N	396	396	396	396	396
Product_Interest	Pearson Correlation	.631**	1	.565**	.657**	.305**
	Sig. (2-tailed)	<.001		<.001	<.001	<.001
	N	396	396	396	396	396
Interactive_Virtual_Platform	Pearson Correlation	.725**	.565**	1	.803**	.611**
	Sig. (2-tailed)	<.001	<.001		<.001	<.001
	N	396	396	396	396	396
Real_time_simulation	Pearson Correlation	.661**	.657**	.803**	1	.591**
	Sig. (2-tailed)	<.001	<.001	<.001		<.001
	N	396	396	396	396	396
Device_Compatibility	Pearson Correlation	.309**	.305**	.611**	.591**	1
	Sig. (2-tailed)	<.001	<.001	<.001	<.001	
	N	396	396	396	396	396

**. Correlation is significant at the 0.01 level (2-tailed).

(Source: IBM's Statistical Package for Social Sciences (SPSS) version 27)

This research has developed the conceptual model as suggested by Sekaran & Bougie (2016), with four independent variables (IV) for this research. Regression coefficients show how important each independent variable is in predicting the dependent variable in relation to the others (Bhandari, 2021). Table 6 indicates R which represents the multiple correlation while R^2 value represents the multiple correlation. The dependent variable's exposure to the overall variation is explained by the R^2

Table 6
Regression Model Summary

Model	R	R Square	Adjusted R Square	Std Error of the Estimate
1	.791[a]	.626	.622	.26857
a. Dependent Variable : Virtual Shopping				
a. Predictors : (Constant), Product Interest, Interactive Virtual Platform, Device Compatibility, Real-time Simulations				

(Source: Created by Authors)

Table 6 shows R^2 value is 0.791, while adjusted R square value is 0.622. This indicates that Product Interest, Interactive Virtual Platform, Real-time simulations and Device Compatibility factors explains 62.2% of the variance in Virtual Shopping. Other factors which are not included in this survey holds the difference of 37.8% in Virtual Shopping.

The coefficient analysis is basically the process of analysing the coefficients (parameters) applied in regression models in which it represents the relationships and the equation between the independent variables and the dependent variable (Bhandari, 2021). In the case of significance, which is less than 0.05, it means that the factor has a significant effect on virtual shopping. Contrarily, if the significance value is more than 0.05, the factor has an insignificant effect. Table 7 indicates the analysis result of four variables which is Product Interest, Interactive Virtual Platform, Real-time simulations and Device Compatibility.

Table 7
Multiple Regression Analysis Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig
		B	Std. Error	Beta		
1	(Constant)	.679	.148		4.604	< .001
	Product Interest (PI)	.240	.037	.274	6.562	< .001
	Interactive Virtual Platform (IVP)	.576	.052	.603	11.029	< .001
	Real-time Simulation (RTS)	.146	.069	-.125	2.112	.035
	Device Compatibility (DC)	-.165	.031	-.216	-5.329	< .001
a. Dependent Variable : Virtual Shopping (VS)						

Source: (Created by Authors)

Unstandardized coefficients (β) shows (β=0.576, P= < .001) for Interactive Virtual Platform which is the highest positive significance. This is followed by Product Interest (β=0.240, P= < .001) and Real-time simulation (β=0.146, P= 0.035). However, Device Compatibility shows (β=-0.165, P= < .001). This suggests a weak positive relationship due to negative (β) values.

ANOVA (Analysis of Variance) is a statistical analysis methodology applied to compare means of three or more groups to determine if there are statistically significant differences between them (Judd, 2017). ANOVA test result in this study shows a F-value of 163.3 and a p-value of 0.000. The p-value which is less than 0.05 shows that the independent factors (Product Interest, Interactive Virtual Platform, Real-time Simulations and Device Compatibility) have a significant effect on Virtual Shopping.

Table 8
ANOVA Test Results

Model		Sum of Squares	df	Mean Square	F	Sig
1	Regression	47.116	4	11.779	163.3	.000[b]
	Residual	28.204	391	.072		
	Total	75.320	395			
a. Dependent Variable : Virtual Shopping						
b. Predictors : (Constant), Product Interest, Interactive Virtual Platform, Device Compatibility,						

Source: (Created by Authors)

Discussion

The study reveals that Product Interest, Interactive Virtual Platform, Real-Time Simulation, and Device Compatibility have significant effects on virtual shopping on the Metaverse platform among retail consumers in Malaysia as tabulated in Table 1.

Table 1
Summary of Hypothesis

Hypothesis	Relationship (IV)		(DV)	Results
H_1	Product Interest	→	Virtual shopping on the Metaverse platform among retail consumers in Klang Valley	Supported
H_2	Interactive Virtual Platform			Supported
H_3	Real-time Simulation			Supported
H_4	Device Compatibility			Supported

→

Source: (Created by Authors)

H1: Product Interest (PI) has a significant effect on virtual shopping on the Metaverse platform among Malaysian retail consumers.

The hypotheses H1 indicates a significant positive relationship between Product Interest (PI) and Virtual Shopping (VS). This is supported by r-value of 0.63 which shows a fairly strong positive relationship. The correlation level between Virtual Shopping and Product Interest (PI) is 0.631 which indicates positive relationship between Virtual Shopping and Product Interest (PI) and it is a significant factor. A strong correlation between Product Interest and Virtual Shopping is indicated by the p-value which is less than 0.005. β value of 0.240 indicates strong positive significance. Thus, this study draws a conclusion that there is a significant positive relationship between Product Interest (IV) and Virtual Shopping (DV) and hence, supported by the hypotheses in this study.

Through this study, previous research emphasizes the importance of Product interest on virtual shopping as it affects many facets of customer behaviour as well as the overall shopping experience. Consumer tends to be more involved in the virtual buying environment, if they are interested in the particular product. Customers that are interested are more likely to look into product specifications where they prefer to use the virtual features, and stay on the platform longer. The outcomes align with research done by Alam et al. (2020) which mentioned that businesses can gain useful information by exploring the particular product categories that attract the greatest interest from consumers in the virtual shopping scene. A

study by Xi et al., (2024) also claimed that the consumers interested in well-known and impressive businesses have been drawn to discover this unique experience in the metaverse environment by the shift towards technology-based innovative company.

H2: Interactive Virtual Platform (IVP) has a significant effect on virtual shopping on the Metaverse platform among Malaysian retail consumers.

The hypotheses H2 indicates a significant positive relationship between Interactive Virtual Platform (IVP) and Virtual Shopping (VS). This is supported by r-value of 0.73 which shows a fairly strong positive relationship. The correlation level between Virtual Shopping and Interactive Virtual Platform (IVP) is 0.725 which indicate positive relationship between Virtual Shopping and Interactive Virtual Platform (IVP). A strong correlation between Interactive Virtual Platform and Virtual Shopping is indicated by the p-value which is less than 0.005. β value of 0.576 indicates strong positive significance.

Thus, this research concludes that there is a significant positive relationship between Interactive Virtual Platform (IV) and Virtual Shopping (DV) and hence, supported by the hypotheses in this study. In line with the hypothesis discussion, it is proven that to ensure an inclusive purchasing experience, interactive platforms can incorporate accessibility features like voice commands, screen readers, and configurable interfaces for those with impairments. Besides that, customers can view products as 3D models and see how they would appear in real life. Interactive platforms frequently offer live chat services using chatbots or customer care agents that use artificial intelligence to provide prompt support and respond to user inquiries. The results are consistent with previous research by Aris et al. (2021), which suggests that an interactive virtual platform is essential in influencing how consumers feel and behave when they purchase online. According to Chung & Al-Khaled (2021), research has indicated that the use of interactive elements like 3D product visualization, virtual reality tours, and customized suggestions has greatly enhanced the acceptance and uptake of online purchasing.

H3: Real-time simulation (RTS) has a significant effect on virtual shopping on the Metaverse platform among Malaysian retail consumers.

The hypotheses H3 indicates a significant positive relationship between Real-time simulation (RTS) and Virtual Shopping (VS). This is supported by r-value of 0.66 which shows a fairly strong positive relationship. The correlation level between Virtual Shopping and Real-time Simulation (RTS) is 0.661 which indicate positive relationship between Virtual Shopping and Real-time Simulation (RTS). A strong correlation between Real-time simulation and Virtual Shopping is indicated by the p-value of 0.035. β value of 0.146 indicates strong positive significance. Thus, this study assumes that there is a significant positive relationship between Real-time simulation (IV) and Virtual Shopping (DV), and therefore, supported by the hypotheses in this study.

The study reveals that the immersive features of the metaverse enables product graphics and animations through interactive elements to replicate the experience of touching senses in traditional brick-and-mortar stores. Metaverse holds the absolute capability to customize products to visualize variations that allow them to connect and travel along the real-time changes based on their preferences made, for instance, virtual try-ons that are mostly offered for apparel, accessories, and cosmetics products.

The result is consistent with the study conducted by Xi et al. (2024) highlighting that the concept of the metaverse is no longer limited to the imagination but has become a futuristic reality that provides full-scale, persistent, and interactive experiences. This is further supported by a study by Deloitte Digital report on Snap Inc., which indicates that AR adoption via mobile usage is expected to hit 75% of the global population by 2025 as almost all smartphone users will be the targeted and frequent AR users (Deloitte, 2022).

H4: Device compatibility (DC) has a significant effect on virtual shopping on the Metaverse platform among Malaysian retail consumers.

The hypotheses H4 indicates a less significant effect between Device Compatibility (DC) and Virtual Shopping (VS). This is supported by r-value of 0.31 which shows a weak positive relationship. The correlation level between Virtual Shopping and Device Compatibility (DC) is 0.309 which indicates positive relationship between Virtual Shopping and Device Compatibility (DC) and it is a significant factor. Nevertheless, a strong correlation between Device compatibility and Virtual Shopping is indicated by the p-value which is less than 0.001. However, β value of -0.165 indicates a weak positive relationship. Due to negative t-value, the researcher used T score to P value calculator to further support the hypothesis and the result shows the hypothesis is supported and the result is significant due to p-value less than 0.05.

Thus, this study concludes that there is a less significant or weak positive effect between Device Compatibility (IV) and Virtual Shopping (DV) and nevertheless, supported by the hypotheses in this study. The observation undertaken from the study is supportive of the role of device compatibility to ensure accessibility across a variety of devices, such as smartphones, tablets, desktops, and virtual reality (VR) devices i.e., headsets to allow consumers to improve and enhance their engagement with virtual shopping platforms. Devices are the medium used to browse and navigate the intended products, therefore device compatibility allows consumers to move seamlessly between various devices while maintaining a consistent and cohesive shopping experience which certainly contributes to a positive user experience. Given that the commands for interactive 3D environments heavily rely on technology, considerable computing power is indeed necessary i.e., personal computers, consoles or smartphones work as an engine where the power of the content is being created. (Byram, 2021).

Implications of the Research

The findings of this research have significant theoretical and practical ramification. Theoretically, the study deepens the comprehension on the receptiveness towards virtual shopping in the metaverse environment among retail consumers. Since virtual shopping is a new technology in Malaysia, there is a dearth of information and understanding surrounding consumers perspectives. The implication from the significant factors of Product Interest, Interactive Virtual platforms, and Real-Time Simulations fosters the acceptance of virtual shopping in a metaverse environment.

However, the result indicates that Device Compatibility to be the least positive significant factor among the rest in engaging consumers towards metaverse virtual shopping. This result implies the hardware and software used raised concerns among consumers that the modalities can impact the shopping experience in terms of convenience, usability and

responsiveness which could limit the accessibility for metaverse e-commerce users for not being able to optimize the platform.

This research provides valuable practical insights that have the potential to improve current theories and models and even inspire the creation of new ones. The research's finding may have important practical ramifications for practitioners looking to use virtual technologies to transform retail, as well as for those creating and designing metaverse platforms. Being highest correlation between Virtual Shopping and Interactive Virtual Platform (IVP), it suggests that, executing efficient virtual shopping platforms plays an important role in influencing consumers while purchasing virtually and may foster a sense of social presence and interaction and form an understanding of how virtual retail environments works.

Contribution

This research has significantly contributed to bridging the gaps in knowledge on virtual shopping in the Metaverse environment. The knowledge gained from the observation of the study can be applied by the retail industry to explore and enrich their marketing and e-commerce strategies. The study emphasized that a virtual shopping experience in the metaverse environment can be achieved by integrating digital and physical shopping nuances. Nevertheless, this research has shed light on ways to explore how virtual shopping platforms complement not only traditional brick-and-mortar stores but also online e-commerce websites, and mobile shopping applications to create an immersive shopping experience for retail consumers.

The research reveals its potential to make practical contributions to benefit the retail business industry by leveraging consumer engagement and shopping experience to align with the growth in the metaverse era. Virtual shopping in the Metaverse environment enhances user experience by interacting in an immersive environment that enables consumers to optimize their preferences and behaviours in the digital space.

Overall, this research provides valuable insights for retail businesses looking to explore virtual technologies to set a great benchmark against the ever-evolving technology. Leveraging such promising technology not only enhances the consumer's shopping experience but also drives business sales as virtual environment facilitates innovative solutions for the future of retail businesses. The consumers' expectations of the metaverse's product interest, interactive virtual platforms, real-time simulations and device compatibility can be levelled up by adopting this immersive technology that showcases 360-navigation capabilities to facilitate informed purchase decisions. This awareness could potentially increase customer satisfaction and loyalty in the longer run.

Limitations and Future Research

There are limitations acknowledged in this research as a result of constraints within limited conceptual and observed boundaries including limitations due to methodological issues and applicability constraints. The time allocated for the researchers to run the survey was relatively short and as a result, the sample gathered specifically within Malaysian region may be inadequate to reflect the universal viewpoints. The survey for this study is designed in a structured questionnaire manner incorporating likert scale closed-ended questions.

While this format gathers the desired answers, it may prohibit the intensity and depth of responses since the answers are limited to a more socially accepted choice given, unlike open-ended questions where respondents can openly elaborate on their thoughts processes, and expectations.

Future research can be conducted on the actual outcome of virtual shopping in the metaverse environment among digital retail consumers. The knowledge growth explicitly emphasized the need for researchers to develop comprehensive methods to leverage the understanding and awareness of Metaverse and its ability to replicate real-world experience in the virtual environment. Extending the sample size to a wider population size in future studies might help to better capture the extent of perspectives that exist within the retail industry. Incorporating qualitative techniques, such as focus groups or interviews, might deepen the results and improve the amount of value achievable considering the drawbacks of standardized surveys. The influence of the identified determinants on virtual shopping over time may also be broadly understood through longitudinal research, that would lead to a more dynamic viewpoint among the targeted respondents.

Conclusion

This research has significantly contributed to bridging the gaps in knowledge on virtual shopping in the Metaverse environment. The significant technology shift and introduction to the metaverse have given people the privilege to access an incredible online virtual environment that replicates real-life immersive experiences. In Malaysia, however, the metaverse is not quite as developed. There is a debate that a few local businesses are attempting to draw people into their metaverse worlds, nevertheless, it appears that adoption is not as rapid as expected (Sabrina, 2024). Nevertheless, with the rapid evolving of technology, is crucial to comprehend how customers respond and interact in the metaverse environment.

Overall, according to the findings of the study, it has been proven that positive correlations exist between the influence of Product Interest, Interactive Virtual Platform, Real-time simulation, and Device compatibility towards the receptiveness of virtual shopping in the metaverse environment among retail consumers in Malaysia. The research findings provide valuable insights for retail businesses looking to explore virtual technologies to set a great benchmark against the ever-evolving technology. The knowledge gained from the observation of the study can be applied by the retail industry to explore and enrich their marketing and e-commerce strategies. The research reveals its potential to make practical contributions to benefit the retail business industry by leveraging consumer engagement and shopping experience to align with the growth in the digital era.

References

Alam, S. S., Ali, M. H., Omar, N. A., & Hussain, W. M. H. W. (2020). Customer Satisfaction in Online Shopping in Growing Markets. *International journal of Asian business and information management (Online),* 11(1), 78-91. https://doi.org/10.4018/ijabim.2020010105

Aris, N. B. M., Latif, R. A., Zainal, N. S. B., Razman, K. K. B., & Anuar, R. B. (2021). Factors Affecting Young Shoppers' Online Shopping Preference in Kelantan, Malaysia. *International journal of academic research in business & social sciences,* 11(14). https://doi.org/10.6007/ijarbss/v11-i14/9618

Bhandari, P. (2021, August 2). Correlation Coefficient | Types, Formulas & Examples. *Scribbr.* https://www.scribbr.com/statistics/correlation-coefficient/

Byram, D. A. (2021). A Study on Customer Perception and Attitude Towards 3d Virtual Reality Shopping. *Information Technology in Industry,* 9(1), 1329–1342. https://doi.org/10.17762/itii.v9i1.275

Cheng, X., Zhang, S., Fu, S., Liu, W., Guan, C., Mou, J., Ye, Q., & Huang, C. (2022). Exploring the metaverse in the digital economy: an overview and research framework. *Journal of Electronic Business & Digital Economics,* 1(1/2), 206–224. https://doi.org/10.1108/jebde-09-2022-0036

Chiang, S. (2023). *Metaverse could drive up profits — but most businesses may not be ready to invest yet.* CNBC. https://www.cnbc.com/2023/04/03/companies-say-metaverse-can-up-profits-but-are-cautious-to-invest-kpmg.html#:~:text=Not%20ready

Chung, J. F., & Al-Khaled, A. A. S. (2021). Factors Affecting Online Purchase Intention of Gen Y in Klang Valley, Malaysia. *International Journal of Academic Research in Business and Social Sciences,* 11(4). https://doi.org/10.6007/ijarbss/v11-i4/9767

Commission Factory. (2023, January 11*). Malaysia eCommerce Statistics and Trends in 2022.* Commission Factory. https://blog.commissionfactory.com/ecommerce-marketing/malaysia-ecommerce-statistics

Deloitte (2021). *Snap Consumer AR Global Report 2021* https://www2.deloitte.com/content/dam/Deloitte/xe/Documents/AboutDeloitte/Snap%20Consumer%20AR_Global%20Report_2021.pdf

Demir, S. (2022). Comparison of normality tests in terms of sample sizes under different skewness and Kurtosis coefficients. *International Journal of Assessment Tools in Education*, *9*(2), 397-409.

Dwivedi, Y. K., Hughes, L., Wang, Y., Alalwan, A. A., Ahn, S. J. (Grace), Balakrishnan, J., Barta, S., Belk, R., Buhalis, D., Dutot, V., Felix, R., Filieri, R., Flavián, C., Gustafsson, A., Hinsch, C., Hollensen, S., Jain, V., Kim, J., Krishen, A. S., & Lartey, J. O. (2022). Metaverse marketing: How the Metaverse Will Shape the Future of Consumer Research and Practice. *Psychology & Marketing*, 40(4), 750–776. wiley. https://doi.org/10.1002/mar.21767

Erjavec, J., & Manfreda, A. (2022). Online shopping adoption during COVID-19 and social isolation: Extending the UTAUT model with herd behaviour. *Journal of retailing and consumer services*, 65, 102867-102867. https://doi.org/10.1016/j.jretconser.2021.102867

Fallon, R. (2022). Council Post: *From Pandemic To Permanent: 3 Consumer Behavioral Shifts That Are Here To Stay.* Forbes. https://www.forbes.com/sites/forbesagencycouncil/2022/06/24/from-pandemic-to-permanent-3-consumer-behavioral-shifts-that-are-here-to-stay/?sh=2aa16d275967

Habil, S. G. M., El-Deeb, S., & El-Bassiouny, N. (2023). The metaverse era: leveraging augmented reality in the creation of novel customer experience. *Management & Sustainability: An Arab Review.* https://doi.org/10.1108/msar-10-2022-0051

Han, S.-L., Kim, J., & An, M. (2023). The Role of VR Shopping in Digitalization of SCM for Sustainable Management: Application of SOR Model and Experience Economy. *Sustainability,* 15(2), 1277. https://doi.org/10.3390/su15021277

Hazzan, K. M. and O. (2022, May 23). *Validity and Reliability in Data Science: An Interdisciplinary Perspective.* Cacm.acm.org. https://cacm.acm.org/blogs/blog-

cacm/261263-validity-and-reliability-in-data-science-an-interdisciplinary-perspective/fulltext

Hernandez, H. (2021). Testing for Normality: What is the Best Method. ForsChem Research Reports.https://www.academia.edu/47769079/Testing_for_Normality_What_is_the_Best_Method

Holmes, F. (2021). *The Metaverse Is A $1 Trillion Revenue Opportunity. Here's How To Invest.https://www.forbes.com/sites/greatspeculations/2021/12/20/the-metaverse-is-a-1-trillion-revenue-opportunity-heres-how-to-invest/*

Hussain, S. (2023). Metaverse for education – Virtual or real? *Frontiers in Education,* 8. https://doi.org/10.3389/feduc.2023.1177429

Jahir, M. S. F. B. M., & Hwa, E. T. B. (2023). Customer e-satisfaction towards online grocery sites in the metaverse world. In *Strategies and Opportunities for Technology in the Metaverse World* (pp. 294-320). IGI Global.

Jiang, Y., & Stylos, N. (2021). Triggers of consumers' enhanced digital engagement and the role of digital technologies in transforming the retail ecosystem during COVID-19 pandemic. *Technological Forecasting and Social Change*, 172(2021), 121029. https://doi.org/10.1016/j.techfore.2021.121029

Judd, C. M., McClelland, G. H., & Ryan, C. S. (2017). *Data analysis: A model comparison approach to regression, ANOVA, and beyond*. Routledge.

Kaur, J., Mogaji, E., Paliwal, M., Jha, S., Agarwal, S., & Mogaji, S. A. (2024). Consumer behavior in the metaverse. *Journal of Consumer Behaviour*, *23*(4), 1720-1738.

Khan, S., Kumar, K., & Sumant, O., (2022). Augmented Reality In Retail Market Research, 2031. https://www.alliedmarketresearch.com/augmented-reality-in-retail-market

Kim, M. J., Lee, C.-K., & Jung, T. (2018). Exploring Consumer Behavior in Virtual Reality Tourism Using an Extended Stimulus-Organism-Response Model. *Journal of Travel Research*, 59(1), 69–89. https://doi.org/10.1177/0047287518818915

Kim, Y., & Oh, H. (2021). Comparison between Multiple Regression Analysis, Polynomial Regression Analysis, and an Artificial Neural Network for Tensile Strength Prediction of BFRP and GFRP. *Materials,* 14(17), 4861. https://doi.org/10.3390/ma14174861

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement,* 30(3), 607–610. https://doi.org/10.1177/001316447003000308

Kulkarni, K., Adithya, V. V., Hitesh, K., & Kumari, N. (2023). Brand Management in the Metaverse. In *The Business of the Metaverse* (pp. 95-112). Productivity Press.

Laerd Statistics. (2018). *Cronbach's Alpha in SPSS Statistics - procedure, output and interpretation of the output using a relevant example | Laerd Statistics.* Laerd.com. https://statistics.laerd.com/spss-tutorials/cronbachs-alpha-using-spss-statistics.php

Lavoye, V., Sipilä, J., Mero, J., & Tarkiainen, A. (2023). The Emperor's New Clothes: Self-explorative engagement in Virtual Try-on service experiences positively impacts brand outcomes*. Journal of Services Marketing,* 37(10), 1–21. https://doi.org/10.1108/jsm-04-2022-0137

Marr, B. (2022, April 11). *7 Important Problems & Disadvantages Of The Metaverse.* Bernard Marr. https://bernardmarr.com/7-important-problems-disadvantages-of-the-metaverse/

Microsoft. (2022). Microsoft HoloLens https://www.microsoft.com/es-es/hololens

Ng, C., & Ramasamy, C. (2018). Augmented Reality Marketing in Malaysia—Future Scenarios. *Social Sciences*, 7(11), 224. https://doi.org/10.3390/socsci7110224

Peterson, B., Bonelli, F., & Macsweeney, R.(2022) *How meeting customers in the metaverse can unlock lasting value* https://www.ey.com/en_my/consumer-products-retail/meet-customers-in-the-metaverse-to-unlock-lasting-value

Pratt, M. (2022, November 8). Metaverse Pros and Cons: Top Benefits and Challenges. Search CIO. https://www.techtarget.com/searchcio/tip/Metaverse-pros-and-cons-Top-benefits-and-challenges

Sabrina, S. (2024). MDEC wants more M'sian startups to join the metaverse & it's offering them up to RM200K. *Vulcan Post*. https://vulcanpost.com/854033/mdec-metaverse-funding-initiative-programme-business-malaysia/

Santosh, G. (2024). *The Impact of Metaverse on E-commerce: A Glimpse into the Future of Shopping* https://www.linkedin.com/pulse/impact-metaverse-e-commerce-glimpse-future- shopping-santosh-g-rkgtc/

Schober, P., Boer, C., & Schwarte, L. A. (2018). Correlation coefficients: Appropriate use and interpretation. *Anesthesia & Analgesia,* 126(5), 1763–1768. https://doi.org/10.1213/ane.0000000000002864

Sekaran, U., & Bougie, R. (2016). *Research Methods for Business: A Skill-building Approach (7th ed.)*. John Wiley & Sons.

Silberstein, N. (2022, June 13). Moving into the Metaverse: Growing Swath of Brands Test Out Virtual Experiences. Retail TouchPoints; Retail TouchPoints. https://bit.ly/3c1aC0o

Singhal, N., Goyal, S. B., Sinha, S., Sharma, A., Kalaimani, S., & Bhanu, K. N. (2024). Revolutionizing Healthcare: The Emergence and Impact of Metaverse Technologies. In Examining the Metaverse in Healthcare: Opportunities, Challenges, and Future Directions (pp. 1-24). IGI Global.

Taber, K. S. (2018). The use of cronbach's alpha when developing and reporting research instruments in science education. *Research in Science Education*, 48(6), 1273–1296.

Taherdoost, H. (2022). Designing a questionnaire for a research paper: A comprehensive guide to design and develop an effective questionnaire. Asian Journal of Managerial Science/Asian *Journal of Managerial Science*, 11(1), 8–16. https://doi.org/10.51983/ajms-2022.11.1.3087

Wang, Y., Su, Z., Zhang, N., Liu, D., Xing, R., Luan, T. H., & Shen, X. (2022). *A Survey on Metaverse: Fundamentals, Security, and Privacy*. https://doi.org/10.36227/techrxiv.19255058

Xi, N., & Hamari, J. (2021). Shopping in virtual reality: A literature review and future agenda. *Journal of Business Research*, 134(1), 37–58. ScienceDirect. https://doi.org/10.1016/j.jbusres.2021.04.075

Xi, N., Chen, J., Gama, F., Korkeila, H., & Juho Hamari. (2024). Acceptance of the metaverse: a laboratory experiment on augmented and virtual reality shopping. *Internet Research,* 34(7), 82–117. https://doi.org/10.1108/intr-05-2022-0334

Yoo, K., Welden, R., Hewett, K., & Haenlein, M. (2023). The merchants of meta: A research agenda to understand the future of retailing in the metaverse. *Journal of Retailing*, *99*(2), 173-192.