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# USER ACCEPTANCE OF VIRTUAL COMMERCE ON METAVERSE: INSIGHTS FROM INNOVATION DIFFUSION THEORY (IDT) AND TECHNOLOGY ACCEPTANCE MODEL (TAM)

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***Abstract***

*In recent years, technological advancements have influenced consumer behavior. One of the most significant developments in this regard is the metaverse. The metaverse, which has frequently captured the interest of experts, is a technological system that forms the basis of the current research. In this context, the present study examined the factors affecting the intention to use and accept the metaverse system. The study constructed a research model using the IDT and the TAM to investigate user acceptance of conducting virtual commerce activities within the metaverse system. Within this framework, structural equation modeling was utilized to explain the acceptance of usage by potential metaverse users. The proposed research model was analyzed using the Smart PLS 3 software package. Among the independent variables of the research, a positive and significant relationship was found between relative advantage as a mediator and the main variables of TAM. However, no significant relationship was identified between complexity, another independent variable, and the main variables of TAM. Additionally, a significant relationship was established between perceived compatibility and perceived ease of use. In this context, from a consumer perspective, when evaluated experientially (effort expended), the shopping experience in the metaverse system showed similarities with physical shopping, while no relationship was found in terms of performance. The most significant contribution of the research to the literature is that attitude and intention, which are the most important antecedents of active usage of metaverse systems, exhibited a positive and significant relationship with all the variables in the relationship.*

***Keywords:*** *Metaverse, Innovation Diffusion Theory, Technology Acceptance Model, Virtual Commerce, Digital Marketing.*

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# METAVERSE'TE SANAL TİCARETİN KULLANICI KABULÜ: YENİLİKLERİN YAYILMASI TEORİSİ (YYT) VE TEKNOLOJİ KABUL MODELİ (TKM) ÇERÇEVESİNDE İNCELENMESİ

***Öz***

*Son yıllarda teknolojideki gelişmeler tüketici davranışını da etkilemektedir. Söz konusu teknolojik gelişmelerden en önemlilerinden biri de metaverse'tür. Uzmanlar tarafından sıklıkla merak konusu olan metaverse, mevcut araştırmanın temelini oluşturan teknolojik sistemdir. Bu bağlamda mevcut çalışma, metaverse sistemini kullanma niyetini ve kabulünü etkileyen faktörleri incelemektedir. Çalışmada, YYT ve TKM kullanılarak bir araştırma modeli oluşturulmuş ve metaverse sisteminde sanal ticaret faaliyetlerinin gerçekleştirilmesinin kullanıcı kabulü incelenmiştir. Bu bağlamda yapısal eşitlik modellemesi ile potansiyel metaverse kullanıcıları tarafından kullanımın kabulü açıklanmaya çalışılmıştır. Önerilen araştırma modeli Smart PLS 3 paket programı ile analiz edilmiştir. Araştırmanın bağımsız değişkenlerinden göreceli avantajın aracı TKM'nin ana değişkenleriyle arasında pozitif ve anlamlı bir ilişki bulunmuştur. Fakat diğer bir bağımsız değişken olan karmaşıklık ile TKM'nin ana değişkenleriyle arasında anlamlı bir ilişki bulunamamıştır. Ayrıca algılanan uyumluluk ile algılanan kullanım kolaylığı arasında anlamlı bir ilişki bulunmuştur. Bu kapsamda tüketici açısından deneyimsel olarak (harcanan çaba) değerlendirildiğinde fiziksel alışverişle metaverse sistemindeki alışveriş deneyimi benzerlik gösterirken, performans açısından bir ilişki bulunamamıştır. Metaverse sistemlerinin aktif kullanımının en önemli öncülleri olan tutum ve niyetin, ilişkide olduğu değişkenlerin tamamıyla pozitif ve anlamlı bir ilişki içinde olması ise araştırmanın literatüre en önemli katkısıdır.*

***Anahtar Kelimeler:*** *Metaverse, Yeniliklerin Yayılması Teorisi, Teknoloji Kabul Modeli, Sanal Ticaret, Dijital Pazarlama.*

## Introduction

In recent years, there has been an increase in the number of consumers opting for digital platforms when purchasing products or services. Especially due to the Covid-19 pandemic, the sensitivity of consumers toward health has led to the digitalization of commercial activities in physical spaces. As a result, the demand for e-commerce has significantly risen (Usas et al., 2021; Hacialioğlu & Sağlam, 2021, p. 446). Furthermore, the Covid-19 pandemic has considerably accelerated the shift of retail sales from physical stores to digital platforms (Dwivedi et al., 2023, p. 754).

Even though the influence of the pandemic has subsided today, a large portion of consumers still maintain their habit of virtual shopping (Shah & Murthi, 2021). This can be attributed to consumers' past experiences. Past experiences can shape consumers' perceptions of future purchasing behavior (Esmaeilpour & Mohseni, 2019, p. 22). In the current research, the primary focus lies in investigating the user acceptance of trade/shopping transactions conducted within the metaverse system, a new dimension of e-commerce. The

acceptance of e-commerce activities within the metaverse system compared to consumers' past experiences of physical shopping constitutes the central question of the research.

The Metaverse aims to provide a human-centered digital experience. The Metaverse is not only a virtual world where consumers consume but also a place where they utilize their creativity. Marketers see the Metaverse as a virtual market with new e-commerce opportunities and are experimenting with various applications (Rathore, 2018, p. 75).

Duman (2022) has proposed that the term "metaverse commerce" (m-commerce) is the successor of e-commerce. This is because the metaverse structure comprises not only the speed and convenience features of e-commerce but also offers more personalization and experiential features found in retail commerce. The metaverse bridges the gap between physical and online shopping experiences. In this way, the metaverse will enhance e-commerce applications and create unique shopping experiences.

In the recent past, research in this field has gained increasing momentum. This study aims to explore the user acceptance of e-commerce activities within the metaverse system. In the context of the metaverse, the existing research initially delves into the general metaverse literature and subsequently explores the virtual commerce literature, concluding with the methodology, analysis, and results sections.

## 1. METAVERSE

The term "metaverse" was first used in Neal Stephenson's science fiction novel, "Snow Crash," in 1992, to describe the successor to the internet in the form of a virtual reality-based environment (Dionisio et al., 2013, p. 34). In the novel, individuals in the physical world entered the metaverse world through virtual reality equipment and lived their lives there (Wang et al., 2022, p. 1).

Thirty years later, the fictional concept of the metaverse has transformed into a tangible business idea for marketing. Several major technology companies like Facebook, Microsoft & Nvidia Corporation have invested millions of dollars to create a consistent digital universe aligned with the metaverse concept. Brands such as Nike, Gucci, Disney & McDonald's have also ventured into this virtual world to seize opportunities for engaging with consumers (Barrera & Shah, 2023, p. 1; Toraman, 2022, p. 68). The emergence of virtual reality worlds on the internet has created an alternative environment and a profitable shopping channel within the context of multi-channel retail, expanding interactive marketing opportunities for all stakeholders (consumers, retailers, and suppliers) (Kuntze et al., 2013, p. 1).

The metaverse is recognized as a digital space where users can exist as digital natives and experience an alternative life in the virtual world (Wang et al., 2022, p. 1). This technology has drawn the attention of many companies,

and after investing in metaverse technologies, Facebook changed its name to Meta in October 2021 (Kraus et al., 2022, p. 52). This digital universe referred to as the "Metaverse" holds the promise of fundamentally changing the way consumers, brands, and companies transact and interact. (Barrera & Shah, 2023, p. 1).

Although proto-metaverses have been used in the gaming industry for many years, the potential benefits of metaverse technology have not yet been fully understood (Analytica, 2022). The metaverse world is an important digital platform for businesses, particularly for establishing direct interaction with young consumers (Hollensen, 2022, p. 1). The metaverse is a blockchain-based technology where people create avatars for their identities (Pamucar et al., 2022, p. 1). The metaverse provides an immersive experience based on augmented reality technology, creates a mirror image of the real world through digital twin technology, establishes an economic system based on blockchain technology, and tightly integrates the virtual world with the real world into the economic system (Ning et al., 2021).

The metaverse economic system consists of digital creation, digital assets, digital market, and digital currency. Digital creation forms the foundation of the metadata repository (Yang et al., 2022, pp. 124-125). The number of creators determines the development of the metaverse economy. Lee et al. (2021), summarize research studies on digital arts related to the metaverse, explaining new artworks in hybrid virtual-physical realities. In virtual environments, experiential retail related to digital assets can shape consumer preferences by deploying data calculation capabilities in an augmented reality-based trading environment, supporting augmented analytics and business intelligence tools (Dawson, 2022, pp. 53-54). The digital market is the primary place where avatars can engage in trade, much like in the physical world. Digital currency is the medium in the metaverse media repository that enables avatars to complete trade and exchange (Yang et al., 2022, p. 125). The metaverse is predicted to revolutionize almost every industry and business's 'value functions,' from healthcare services to consumer products, entertainment, and business-to-business solutions (Hollensen, 2022, p. 1).

Metaverse is a subject of research in various disciplines such as information technology, marketing, education, tourism, and psychology. As a new platform that might help understand consumer behaviors, metaverse will offer new opportunities for marketers to reach existing and potential customers and provide them with an immersive experience (Dwivedi et al., 2023, p. 761). While providing new ways for marketers to connect and engage with consumers, the metaverse offers opportunities for further research on consumer behaviors, responses, and inferences (Barrera & Shah, 2023, p. 14). The current research also focuses on this subject, examining consumers' adaptation to shopping processes in the metaverse system and the factors influencing this adaptation.

## 2. VIRTUAL COMMERCE

Virtual commerce, the latest development in e-commerce, involves commercial activities conducted in a three-dimensional virtual environment. From a technological standpoint, virtual commerce consists of e-commerce infrastructures like electronic product catalogs and electronic payments, adopting three-dimensional technology to create new environments for commercial activities (Laudon & Traver, 2016). Three-dimensional technology consists of computer software and hardware that stimulate a person's five senses (sight, hearing, touch, smell, and taste) in a simulated environment, creating a sense of presence or a feeling of being there (Shen et al., 2021, p. 11087).

Virtual Reality Retailing (VRR), closely related to the concept of e-commerce, enables businesses to actively involve customers in the sales process. This active role allows customers to personalize the consumption process by collaboratively creating and customizing products and services (Kuntze et al., 2013, p. 1).

For many entrepreneurs, the use of social virtual worlds (SVWs) like Second Life (SL) to sell both virtual and real products has been of interest. Real-world brands (e.g., Toyota, L'Oreal) have used these platforms to establish virtual stores for various business purposes (Hassouneh & Brengman, 2015, p. 218). In the first ten years of SL's existence, users created and sold 2.1 million virtual products, and transactions exceeding 3.2 billion US dollars were conducted (Linden Lab, 2013). However, most major brands were unable to sustain successful store operations in the virtual world and have since left SL, the most advanced SVW.

The metaverse has provided consumers with a more robust, immersive, and real-time shopping experience by replacing the concept of e-commerce with m-commerce (Khatri, 2022, p. 2). In the Metaverse world, consumers can try on products, walk around virtual stores, and make purchases—all within the virtual interface (Rathore, 2018, p. 75). This is one of the most significant differences that distinguish virtual commerce from e-commerce.

In the industry, three-dimensional technology has been widely adopted in forms like augmented reality (AR) and virtual reality (VR) in games (Shen et al., 2021, p. 11087). Built upon the convergence of technologies like AR and VR, the metaverse enables virtual environments, digital elements, and individuals to interact in multi-modal ways (Pamucar et al., 2022, p. 1). For instance, Adidas employs AR to allow consumers to virtually try on shoes, and Ikea utilizes a studio application that allows customers to visualize furniture in their own homes (Dwivedi, 2023, p. 754; Ramadan, 2023, p. 3).

As technologies become more complex (e.g., virtual worlds) and ubiquitous (e.g., mobile technology), consumers' ways of gathering information, making choices, and ultimately purchasing and paying for products will not be uniform. Therefore, established marketing and consumer behavior theories and models may need to be adapted to fit a new world order

where shopping and purchasing are no longer standardized behaviors (Kuntze et al., 2013, p. 1).

## 3. METHODOLOGY

In the methodology section of the research, firstly, the sampling method, data collection process, and analysis method are discussed. Subsequently, the research model and hypotheses are addressed.

### 3.1. Sample, Data Collection, and Analysis Method

Ethics committee approval was received for this research from Istanbul Nişantaşı University Ethics Committee on September 26, 2022 with the number 2022/37.

Metaverse technology, in general usage, requires a computer and an 0internet connection. Considering accessibility options, individuals capable of using technological devices can easily engage with the metaverse system. In this context, the universe of the research consists of individuals over the age of 18 who use technological devices (tablets and computers) living in Istanbul. The sampling method used in the research is the convenience sampling method, which is a non-probability sampling method. The convenience sampling method involves including accessible individuals from within the research population (Hair et al., 2010; Hair et al., 2017).

Data was collected through an online survey. The online survey was conducted using Google Docs between 05.02.2023 and 05.03.2023. A pilot test was administered to 30 participants using the online survey. Based on feedback from the pilot test, the survey was finalized. The online survey was sent to 385 individuals, and 234 responses were received. After necessary data cleaning, analysis was conducted with 206 usable data points. Descriptive statistics of the participants are presented in Table 1.

**Table 1. Descriptive Statistics**

| | | Percent (%) |
|---|---|---|
| Age | 18-20 | 35.4 |
| | 21-29 | 45.2 |
| | 30-39 | 9.7 |
| | 40-49 | 6.3 |
| | 50 and over | 3.4 |
| | Total | 100.0 |
| Gender | Female | 38.8 |
| | Male | 61.2 |

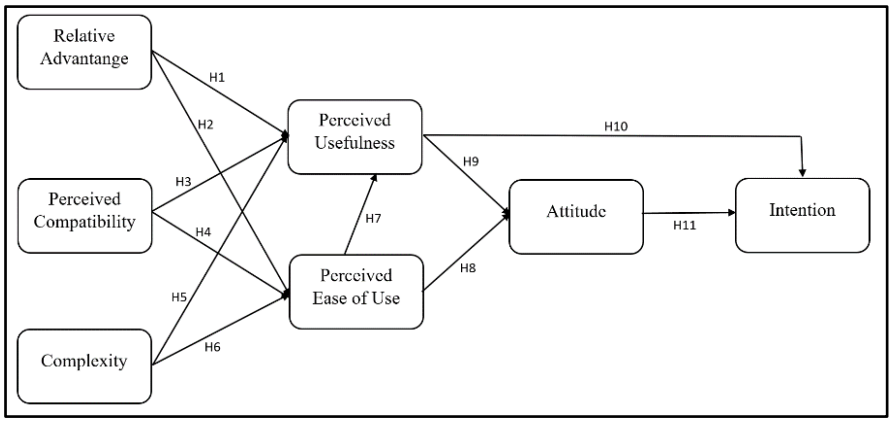
| | | |
|---|---|---|
| | Total | 100.0 |
| Education | High school degrees | 4.9 |
| | Associate degrees | 22.3 |
| | Undergraduate degrees | 60.2 |
| | Graduate degrees | 12.6 |
| | Total | 100.0 |
| Monthly Income | 5.500 ₺ and under | 45.6 |
| | 5.501 ₺ and 7,500 ₺ | 18.4 |
| | 7.501 ₺-10.500 ₺ | 11.2 |
| | 10.501 ₺-15.000 ₺ | 10.2 |
| | 15.001 ₺ and over | 14.6 |
| | Total | 100.0 |

Partial Least Squares-Structural Equation Modeling (PLS-SEM), a widely used method for examining relationships between multiple variables in research, was employed in the current study. Several analysis software packages are available for PLS-SEM procedures. The present research used the Smart PLS 4 software package for analysis. Initially, reliability and validity analyses were completed, followed by correlation analysis and hypothesis testing after necessary simplifications (Hair et al., 2010; Hair et al., 2017).

### 3.2. Research Model and Hypotheses

Technological advancements have long been a subject of study by experts. In the current study, the emerging metaverse system, where future e-commerce activities will take place, is examined. Metaverse systems that utilize blockchain technology as their infrastructure have led to the creation of a research model using the Innovation Diffusion Theory (IDT) and the Technology Acceptance Model (TAM), commonly used for researching new technologies in the literature. The research model is depicted in Figure 1. As seen in the research model, the research subject is examined through 11 hypotheses (Hair et al., 2010; Hair et al., 2017).

**Figure 1. Research Model**




Innovation Diffusion Theory (IDT) has become increasingly complex and multifaceted in recent years. This theory has been used and continues to be used in studies across various sectors, including durable goods, services, the pharmaceutical industry, and others (Ying & Mengqing, 2011).

IDT examines the processes through which individuals or groups in an organization accept or reject new events, phenomena, or technologies. The core philosophy of IDT aims to enhance the level of adaptation by reducing uncertainties in the process of adapting to innovations (Rogers, 2002; Rogers, Singhal & Quinlan, 2014). Rogers (2003) mentions five attributes that influence the adoption of an innovation: relative advantage over existing technologies, compatibility with organizational workflows and knowledge, complexity of implementation, trialability, and the observability of innovation's development within the organization and among competitors. Individuals' perceptions of these five attributes predict the speed of innovation adoption (García-Avilés, 2020, p. 2).

The theory argues that if innovation is perceived by potential adopters as a novel concept, it will experience an increased rate of diffusion. Innovations should be perceived by potential adopters as having the following qualities: they should be capable of being tried on a limited basis before full adoption, yield observable results, provide an advantage over other innovations (or the current situation), not be overly complex, and be compatible with existing practices and values (Surry & Farquhar, 1997, p. 5).

Tornatzky & Klein (1982), using IDT in a meta-analysis, identified three beliefs consistently associated with innovations: relative advantage, complexity, and compatibility. In the current study, these three variables of IDT have been utilized.

**Table 2. Studies on IDT and TAM**

| Year | Authors | Industry | Hypothesis | Relation |
|---|---|---|---|---|
| 2003 | Hardgrave et al. | Software | C → I | Not supported |
| | | | PC → I | Supported |
| 2005 | Wu & Wang | Mobile Commerce | PC → I | Supported |
| | | | PC → I | Supported |
| | | | PEOU → I | Not supported |
| | | | PEOU →PU | Supported |
| 2007 | Lee | E-reading | RA → I | Supported |
| | | | C → I | |
| 2007 | Shih | E-learning | RA → I | Supported |
| | | | C → I | |
| 2008 | Chang & Tung | E-learning | PC → I | Supported |
| | | | PC → PU | Supported |
| | | | PU→ I | Supported |
| | | | PEOU →PU | Supported |
| | | | PEOU → I | Supported |
| 2010 | Nor et al. | Technology | RA→ A | Supported |
| | | | PC→ A | Supported |
| | | | PEOU → A | Not supported |
| | | | O → A | Supported |
| | | | A→ I | Not supported |
| 2012 | Al-Jabri et al. | Mobile Banking | O → AP | Not supported |
| | | | C→ AP | Not supported |
| | | | G→ AP | Supported |
| | | | O → AP | Not supported |
| 2012 | Wang et al. | Technology | RA→ AP | Supported |
| | | | C → AP | Supported |
| | | | PC → AP | Supported |
| 2021 | Yuen et al. | Technology | PEOU → I | Supported |
| | | | PC→ PEOU | Supported |
| | | | O → PEOU | Supported |
| 2021 | Al-Rahmi et al. | E-learning | RA→ PEOU | Supported |
| | | | C→ PEOU | Supported |
| | | | O → PEOU | Supported |
| | | | G → PEOU | Supported |
| | | | PC→ PEOU | Supported |
| | | | RA→PU | Supported |
| | | | C→ PU | Supported |

| | | | |
|---|---|---|---|
| | | O → PU | Supported |
| | | G → PU | Supported |
| | | PC →PU | |
| 2022 | Toraman & Geçit | Metaverse | PEOU → PU | Not supported |
| | | | PEOU → I | Supported |
| | | | PU → I | Supported |
| | | | PC → PU | Supported |

RA: Relative Advantage, A: Attitude, PC: Perceived Compatibility, PEOU: Perceived Ease of Use, T: Trialability, O: Observability, I: Intention, AP: Adoption, C: Complexity, PU: Perceived Usefulness

The table has been created by the authors.

Relative Advantage (RA) is the evaluation of consumers comparing metaverse systems with their shopping activities in the physical environment. According to the Innovations Diffusion Theory (IDT), if an individual perceives that something is a better option than the current practice, they will adopt the new idea, product, or service. If a user finds the innovation more advantageous when compared to the existing option, they will be motivated to transition to the new innovation. Scale statements were adapted for this study by examining previous research in the literature (Rogers, 2002; Rogers et al., 2014).

H1: Relative advantage has an impact on perceived usefulness.

H2: Relative advantage has an impact on perceived ease of use.

Perceived Compatibility (PC) is the assessment of consumers considering their shopping activities through metaverse systems and their past experiences. According to the IDT, perceived compatibility is the extent to which an innovation is perceived to be consistent with the consumer's needs, values, beliefs, prior ideas, and past experiences. The higher the compatibility of the innovation, the greater the chance of adoption. However, excessive compatibility can sometimes be a problem, as users may not find an innovation worth trying or may not perceive it as an innovation. Scale statements were adapted for this study by examining previous research in the literature (Rogers, 2002; Rogers et al., 2014; Wani & Ali, 2015; Toraman, et al., 2023, pp. 163-164; Toraman & Yüksel, 2022, p. 25).

H3: Perceived compatibility has an impact on perceived usefulness.

H4: Perceived compatibility has an impact on perceived ease of use.

Complexity (C) is the degree to which consumers perceive the difficulty of using systems in the process of conducting shopping activities through metaverse systems. According to Rogers, the simpler the innovation, the higher the rate of adoption. Scale statements were adapted for this study by examining previous research in the literature (Rogers, 2002; Rogers et al., 2014).

H5: Complexity has an impact on perceived usefulness.

H6: Complexity has an impact on perceived ease of use.

Perceived ease of use (PEOU) is the degree to which consumers believe that their potential workload, both physically and mentally, will decrease when using metaverse systems in their shopping activities. Scale statements were adapted for this study by examining previous research in the literature (Venkatesh & Davis, 2000; Venkatesh & Morris, 2000).

H7: Perceived ease of use has an impact on perceived usefulness.

H8: Perceived ease of use has an impact on attitude.

Perceived usefulness (PU) is the degree to which consumers believe that their performance, in terms of productivity, will increase when using metaverse systems in their shopping activities. Scale statements were adapted for this study by examining previous research in the literature (Venkatesh & Davis, 2000; Venkatesh & Morris, 2000).

H9: Perceived usefulness has an impact on attitude.

H10: Perceived usefulness has an impact on intention.

Attitude (A) is the positive or negative evaluation that consumers have towards the processes they will undertake in shopping activities through metaverse systems. Intention (I) expresses users' thoughts about using the technology in question. The intention variable is also seen as a prerequisite for behavior. A positive relationship can be observed between intention and behavior (active use). Scale statements were adapted for this study by examining previous research in the literature (Venkatesh & Davis, 2000; Venkatesh & Morris, 2000).

H11**:** Attitude has an impact on intention.

## 4. ANALYSIS AND FINDINGS

During the analysis process of the study, it was initially determined that the data exhibited a normal distribution. The skewness and kurtosis results of the study data were found to be between -1.5 and +1.5. This indicates that the research data exhibit a normal distribution (Tabachnick & Fidell, 2007). After establishing the normal distribution of the research data, reliability, and validity analyses were conducted. These analyses are presented in Table 3. In Table 3, factor loadings, Cronbach's Alpha, composite reliability, and Average Variance Extracted (AVE) are shown. Factor loadings, Cronbach's Alpha, and composite reliability values above 0.70 and AVE values above 0.50 in the research data indicate that reliability and validity analyses are statistically significant. However, due to factor loading values of 0.311 for the third sub-dimension of Perceived Compatibility (PC3), it was not included in the analysis process. Another analysis conducted in the research is the determination of VIF values. As a result of this analysis, the highest VIF value is 4.118 for the third sub-dimension of Relative Advantage (RA3). Since the

value is below 5, there is no issue in conducting the analysis with the research data (Hair et al., 2017; Hair et al., 2010).

**Table 3. Reliability and Validity Analysis**

| Variables | Factor Loadings | Cronbach's Alpha | Composite Reliability | Average Variance Extracted (AVE) |
|---|---|---|---|---|
| PU1 | 0.884 | 0.884 | 0.920 | 0.743 |
| PU2 | 0.851 | | | |
| PU3 | 0.900 | | | |
| PU4 | 0.811 | | | |
| PEOU 1 | 0.872 | 0.913 | 0.939 | 0.793 |
| PEOU 2 | 0.886 | | | |
| PEOU 3 | 0.910 | | | |
| PEOU 4 | 0.893 | | | |
| PC1 | 0.919 | 0.890 | 0.932 | 0.820 |
| PC2 | 0.894 | | | |
| PC4 | 0.903 | | | |
| RA1 | 0.898 | 0.894 | 0.927 | 0.763 |
| RA2 | 0.908 | | | |
| RA3 | 0.929 | | | |
| RA4 | 0.748 | | | |
| C1 | 0.822 | 0.724 | 0.840 | 0.637 |
| C2 | 0.845 | | | |
| C3 | 0.722 | | | |
| I1 | 0.927 | 0.889 | 0.931 | 0.819 |
| I2 | 0.851 | | | |
| I3 | 0.935 | | | |
| A1 | 0.882 | 0.877 | 0.924 | 0.803 |
| A2 | 0.908 | | | |
| A3 | 0.897 | | | |

PU: Perceived Usefulness, PEOU: Perceived Ease of Use, PC: Perceived Compatibility, RA: Relative Advantage, C: Complexity, A: Attitude, I: Intention

**Table 4. Correlation-Fornell-Larcker Criterion Values**

| | PU | PEOU | PC | RA | C | I | A |
|---|---|---|---|---|---|---|---|
| PU | 0.862 | | | | | | |
| PEOU | 0.797 | 0.890 | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| PC | 0.701 | 0.703 | 0.906 | | | | |
| RA | 0.766 | 0.727 | 0.821 | 0.873 | | | |
| C | 0.355 | 0.249 | 0.386 | 0.400 | 0.798 | | |
| A | 0.740 | 0.763 | 0.698 | 0.714 | 0.226 | 0.905 | |
| I | 0.784 | 0.773 | 0.697 | 0.719 | 0.258 | 0.820 | 0.896 |

PU: Perceived Usefulness, PEOU: Perceived Ease of Use, PC: Perceived Compatibility, RA: Relative Advantage, C: Complexity, A: Attitude, I: Intention

Table 4 presents the results of the study's correlations according to the Fornell-Lacker Criterion. According to the Fornell-Lacker Criterion Values, the variables of the study should have the highest value in the column where they are located. When examined in the research in a general context, it was determined that the correlation with the variable 'Complexity' is low. The correlation values of the other variables used in the research are observed to be close to 0.7. This situation indicates a significant relationship among the variables. In this context, the results of the study are statistically significant (Hair et al., 2017; Hair et al., 2010).

**Table 5. $R^2$ and $Radj^2$ Values of the Variables**

| Items | $R^2$ | $Radj^2$ |
|---|---|---|
| PU | 0.715 | 0.709 |
| PEOU | 0.568 | 0.561 |
| I | 0.696 | 0.693 |
| A | 0.674 | 0.671 |

PU: Perceived Usefulness, PEOU: Perceived Ease of Use, A: Attitude, I: Intention

The R2 and adjusted R2 values of the dependent variable in the research indicate an important result of the analysis. With an R2 value of 0.696 and an adjusted R2 value of 0.693, the dependent variable intention has an explanation percentage of approximately 70%, which is considered acceptable (Hair et al., 2017; Hair et al., 2010).

**Table 6. Outputs of the Structural Model**

| Hypothesis | Relationship | Path Coefficient | t Value | p Value | p<0,05 Is the hypothesis supported? |
|---|---|---|---|---|---|
| H1 | RA→PU | 0.330 | 4.033 | 0.000 | Supported |
| H2 | RA→PEOU | 0.480 | 5.114 | 0.000 | Supported |
| H3 | PC→PU | 0.044 | 0.615 | 0.538 | Not supported |
| H4 | PC→PEOU | 0.336 | 3.547 | 0.000 | Supported |
| H5 | C→PU | 0.080 | 1.540 | 0.124 | Not supported |

| | | | | | |
|---|---|---|---|---|---|
| H6 | C→PEOU | -0.073 | 1.466 | 0.143 | Not supported |
| H7 | PEOU →PU | 0.506 | 6.892 | 0.000 | Supported |
| H8 | PEOU →A | 0.406 | 5.184 | 0.000 | Supported |
| H9 | PU→A | 0.460 | 5.741 | 0.000 | Supported |
| H10 | PU→I | 0.253 | 3.081 | 0.002 | Supported |
| H11 | A→I | 0.621 | 7.374 | 0.000 | Supported |

It is significant in the value range of $p<0.05$.

RA: Relative Advantage, PU: Perceived Usefulness, PEOU: Perceived Ease of Use, PC: Perceived Compatibility, C: Complexity, A: Attitude, I: Intention

The results of the hypotheses included in the research model are shown in Table 6. Upon examining the results of the hypotheses, hypotheses H3, H5, and H6 have been rejected, while the other hypotheses have been accepted. The rejection of two hypotheses related to the Complexity variable indicates a lack of fit with the research model (Hair et al., 2017; Hair et al., 2010). In future studies, considering this aspect, it may be considered not to include this variable in the research model (Venkatesh & Davis 2000).

## Conclusion

Especially with the announcement of Facebook's name change to Meta, the metaverse world has attracted significant attention both in the professional business world and academia. Metaverse allows avatars to engage in activities such as creativity, exhibitions, entertainment, social networking, and commerce, seamlessly integrating the real world with the virtual world.

In this study, a research model was constructed using marketing theories such as the Innovations Diffusion Theory and the Technology Acceptance Model, and the user acceptance of e-commerce activities in the metaverse system was investigated using the IDT and TAM models.

When evaluating the findings of the research, it can be said that users perceive metaverse systems as a technology that is more beneficial and easier to use compared to conducting shopping transactions in physical environments. Looking at this result, it can be inferred that users believe that metaverse systems will create positive differences in accessing products they can purchase. For instance, they may perceive that accessing NFT art pieces exhibited on the metaverse will save time compared to physical art pieces.

Perceived compatibility positively effects perceived ease of use, while it does not have an impact on perceived usefulness. From this result, it can be stated that metaverse systems are perceived to be in line with consumers' lifestyles and desires, making it easy for them to perceive the process of purchasing products through metaverse systems compared to their past experiences. In other words, the alignment of consumers' shopping activities on the metaverse with their past experiences positively effects their view of the metaverse system.

Moreover, the variable of complexity did not show a significant relationship with the other two variables. The perceived complexity of conducting trade activities through metaverse systems does not seem to affect perceived ease of use and perceived usefulness.

It has been observed that perceived ease of use has a positive impact on perceived usefulness and attitudes. Consumers' belief that shopping through the metaverse system will be easy influences their positive belief that they can easily access products, examine them, and purchase them through this system, ultimately increasing their efficiency.

The degree to which users believe that their performance will increase when using metaverse systems for shopping activities positively influences their attitude towards metaverse and their intention to use this technology. When consumers believe that shopping through the metaverse will enhance their efficiency, they will also view the processes within this system positively.

Lastly, it has been seen that attitude positively influences the intention of users to use the technology. In conclusion, it has been determined that attitude and intention, which are the most important antecedents of active usage of metaverse systems, are positively and significantly related to all the variables involved in this relationship. This result is among the most important outputs of the research.

This study is believed to contribute to marketing professionals' planned marketing programs in the metaverse system. Arranging marketing practices in the metaverse system to be aligned with consumers' past experiences, making shopping processes easy and efficient for consumers, will positively influence the potential customer base on this platform.

It should be noted that metaverse systems do not yet have a sufficient number of users, and the fact that the system is used by a limited number of people in specific areas should not be overlooked. However, despite being in the developmental stage, numerous studies are being conducted in this field. When the current research is evaluated in this context, it is believed to shed light on future studies on the metaverse.

Metaverse is planned to have a blockchain-based system architecture. The inclusion of cryptocurrencies, which are one of the main developments in blockchain technology, in metaverse systems will enable consumers to conduct product research, purchasing, and payment transactions within the metaverse ecosystem in the future.

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