Examine the Intention of Generation Z to Adopt Metaverse Apps and Devices: A Technology Acceptance Model Approach

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Abstract

This study will investigate the perceptions of Generation Z about metaverse applications and devices in underdeveloped nations such as India.This study will examine perceived usefulness, perceived ease of use, and perceived entertainment. Additionally, personal innovativeness in information technology will be examined. Exploratory factor analysis (EFA) will identify the components, and multiple regression will evaluate the link between independent variables and dependent variables in metaverse app and device uptake. The results show that metaverse application and gadget use are significantly influenced by perceived usefulness, perceived enjoyment, PEOU, and personal innovativeness in information technology (PIIT). The findings affect marketers and developers creating Z-generation metaverse experiences that are entertaining and useful. This study should assist metaverse and internet companies attract young customers to the metaverse.

Keywords: Perceived Usefulness, PEOU, Perceived Enjoyment, PIIT and Generation Z.

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Introduction

When it comes to cutting-edge virtual reality and augmented reality approaches, escape room metaverse applications are leading the way *(Nicolosi et al., 2024)*. Gen-Z: Being the digital natives, Gen- Z is very open to metaverse applications and they are found to make use of innovative digital platforms *(Al-Adwan & Al-Debei, 2024)*. The way people study, play, and engage with one another may be transformed by these metaverse apps, which provide immersive and engaging experiences *(George et al., 2021)*. Developers and marketers that wish to effectively interact with this tech-savvy generation must be aware of Gen-Z's plan to employ metaverse applications *(Mandal et al., 2024). Alalwan et al. (2018)* state that because TAM concentrates on significant factors including reported pleasure, perceived usefulness, and perceived ease of use, it has long been recognized as a reliable approach for examining technology adoption. By adding a new variable, PIIT, to the traditional TAM framework, this study aims to broaden its scope. The study's thorough explanation of PIIT, perceived utility, perceived ease of use, and perceived entertainment will help to clarify Gen Z's behavioral intention toward the adoption of metaverse apps in emerging economies in the Indian context. This work presents vital information about the connections between these dimensions via the use of sophisticated statistical methods (EFA and multiple regression). The findings may benefit both theoretical

and practical views in the context of metaverse adoption.

Gen Z:

Members of Generation Z, who were born between the mid-1990s and the early 2010s, is a distinct generation of people noted for being good with technology, being active in social causes, and having different behavioural inclinations. Academics say that Generation Z's upbringing during times of fast technological progress, economic instability, and global catastrophes (such the Great Recession and the COVID-19 pandemic) had a big impact on their values, decisions, and points of view, making them distinct from previous generations. Research shows that they rely on internet platforms to talk to each other, learn new things, and support; studies show that Generation Z cares about mental health, diversity, and flexible work arrangements, which is changing the way people learn and work *(Ninan et al., 2020)*. To be sure, however, worries about less attention and fewer face-to-face engagement. The next studies look at how Generation Z spends their money, showing that they tend to choose businesses that promote sustainability and experiences that are cantered on technology. lack of faith in established organizations and reliance on material created by peers for choices make traditional marketing methods less effective *(Van der bergh et al., 2024)*. Experts in education are looking at how Generation Z likes to study. They are focusing on how advancements in technology are simplifying the process for them to learn by seeing, doing, and directing their own learning. Despite these novel concepts, there is a lack of longitudinal study that examines the entire scope of Generation Z's societal impacts over the long term, particularly as adults *(Pradhan et al., 2023; Stylos et al., 2021)*. Most present studies only look at Western cultures, thus future study should look at how differences in culture throughout the world affect this generation's behaviour. Policymakers, teachers, and businesses need to understand Generation Z to keep up with a demographic climate that is changing quickly.

Literature Review & Hypothesis Development:

Behavioral intention:

It describe how ready an entity is to do a certain activity, which may be affected by things like societal standards, perceived value, and personal incentives *(Luarn & Lin, 2005)*. To grasp the human side of technology adoption, this notion is crucial, how they act as consumers, and how they use services. Idea that people embrace technology *(Park et al., 2012),* how individuals act in relation to health *(Huang et al., 2016)*, and how they choose schools *(Lin et al., 2013)*. The next sections go into in further depth about crucial elements that affect behavioural intention in different situations, such as how enjoyable something is, how it affects mobile payment adoption, how it changes attitudes toward online shopping, how it affects gaming behaviour, how it helps e-commerce and repurchase intention, and how it affects online learning. There are several aspects that could influence someone's desire to use metaverse devices and apps, including how helpful; how much fun they have with them, and how great they think they are *(Aburbeian et al., 2022; Pragha et al., 2025)*. Researchers have shown that first-time and seasoned users have distinct motivations for and obstacles to using a product. To improve user engagement and pleasure in the metaverse, knowing how these mechanisms work is crucial *(Pyae et al., 2023; Shin & Hyeon, 2024)*.

Perceived Enjoyment:

It is known to be a major aspect that boosts user engagement and pleasure, and this influences their behaviour and likelihood of making a repeat purchase *(Hsu & Lu, 2007)*. In the country, people's opinions about how enjoyable mobile payment systems are having a big impact on whether or not they use them. Evidently, individuals are more inclined to utilize technology that they find fun *(Rouibah et al., 2016)*. Studies on mobile gaming demonstrate that the likelihood that individuals would play a game again is closely correlated to their expectations of how much they will like it. Enjoyment is a big reason why people keep playing games like Mobile Legends, Candy Crush, and others *(Ong et al., 2023)*. This shows that fun is significant factor for people to be engaged and involved in gaming communities. studies show how important it is to make user experiences fun to build trust and get them to buy again. Students' enjoyment of their online learning experiences is significantly influenced by their perceptions of the content's usefulness and accessibility. This suggests that fun learning experiences might make students more interested in studying *(Nguyen, 2022)*.

H1: Perceived enjoyment significantly influences behavioural intention of Gen Z to adopt metverse apps and device.

Perceived Ease of Use (PEOU):

Research indicates that PEOU significantly affects users' intentions to adopt and utilize technology. The following parameters can elaborate on the implications of PEOU in different contexts like: impact on impulsive buying behavior, influence on digital banking adoption, adoption of digital payment systems, educational technology. *Soomro & Habeeb, (2024)* studied on mobile commerce and revealed that PEOU negatively correlates with impulsive buying behavior, suggesting that user-friendliness alone may not drive spontaneous purchases. Instead, hedonic and utilitarian values play a moderating role in this relationship. PEOU plays significant role in educational technology itself. High PEOU leads to greater user happiness and engagement in educational situations, as shown by products like Quizlet. This highlights the importance of intuitive design in learning apps *(Setyaningsih, 2023)*.

H2: Perceived ease of use significantly influences behavioural intention of Gen Z to adopt metverse apps and device.

Perceived usefulness:

It shows how much of an improvement in performance or happiness a user anticipates making after using a certain piece of technology. The following sections elaborate on its significance in different contexts. Higher video quality on social media platforms enhances perceived usefulness, leading to increased emotional engagement with content *(Moran et al., 2020)*. The study emphasized that improving video quality can amplify cultural impact by fostering deeper audience connections. It is observed that not only in the social media platforms but in the digital banking platforms too perceived usefulness plays a pivotal role. *Olivia and Marchyta (2022)* discovered that people's perceptions of e-wallets' usefulness have a positive impact on their degree of satisfaction with them, which in turn affects how they shop online. People believed that robotic technology was considerably more important than traditional methods in the healthcare industry for

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preventing patient falls. Studies shows that healthcare companies employ technology more in patient care *(Shore et al., 2022).* This way of thinking may make things safer for both patients and healthcare workers *(Ericsson et al., 2019).* People sometimes think that perceived usefulness is a sound reason to accept new technology, but it is important to remember that other aspects, including how easy it is to use and how much confidence people have in it, may significantly effect on how people use it and what choices they make in various situations *(Hornbaek & Hertzum, 2017).*

H3: Perceived usefulness signifianltly influences behavioural intention of Gen Z to adopt metverse apps and device.

PIIT:

It is crucial for enhancing creative work behaviour and digital entrepreneurs' success *(Wu & Yu, 2022).* It affects how people use and adapt technology, which impacts the company's outcomes. One component of PIIT is a strong desire for change. When people see technology as easy to use and useful, they are more likely to adopt and apply it *(Yi et al., 2006)*. In the world of digital entrepreneurship, PIIT affects the link between IT culture and business performance. This indicates that innovative individuals may use their IT skills to address challenges more efficiently *(Wang et al., 2013)*. Digital company performance may be positively or negatively affected by the interplay between PIIT and IT project experience *(Singh et al., 2011)*. Research reveals that PIIT can predict how easy people think it is to utilize community networking sites. In general, PIIT is seen as a positive thing that encourages individuals to use and create using technology. However, it is important to remember that not everyone is inventive, which might make people embrace and use technology in various ways in different situations.

H4: PIIT signifianltly influences behavioural intention of Gen Z to adopt metverse apps and device.

Conceptual Framework

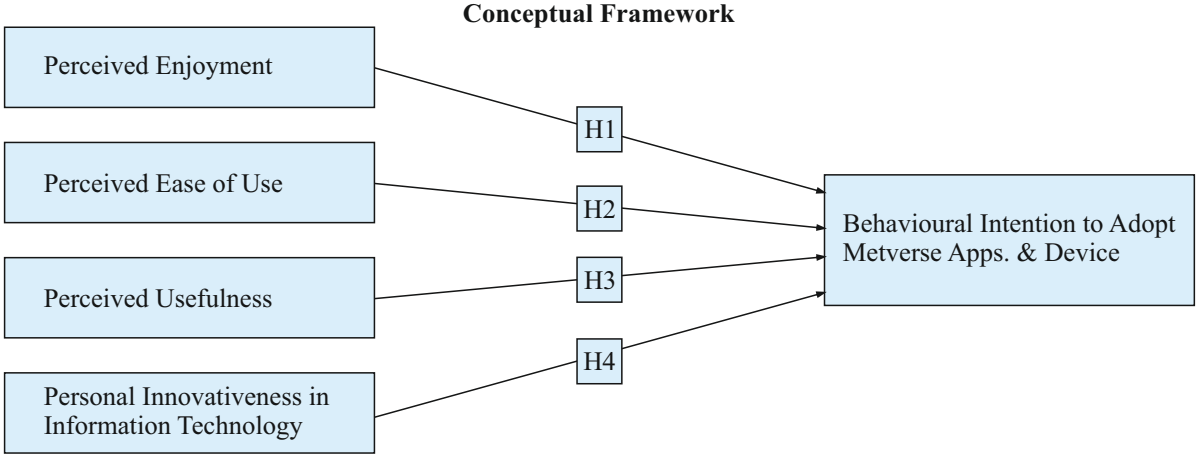

Figure-1

Source: Previous Literature

Research Methodology:

Data Collection:

We used Google Forms to collect data for a structured survey, which we then shared in English with responders on social media sites like Telegram, Instagram, Line, and WhatsApp. Responses were collected using five-point Likert scale. Total 556 respondents responded to the questionnaires. However, 196 responses had to be dropped from additional research as the respondents did not respond to all the questions in the correct order. So, we ended up with just 360 responses for this study, purposive sampling has been used to collect the data.

Construct Measurement:

The items considered for this research "were taken from different sources and were adapted to fit in the" present study (table -1). The items for 'Perceived usefulness,' 'Perceived ease of use' was adapted from *("Davis Fred D., 1989")*, Perceived enjoyment *(Merhi, 2016),* and lastly 'Behavioural intention' from *(De Ruyter et al., 2001)".*

Table-1 Measurement

Constructs	No of Items	Source
Perceived Usefulness	3	Davis Fred D., 1989
Perceived Ease of Use	3	Davis Fred D., 1989
Perceived Enjoyment	3	(Merhi. 2016)
Personal Innovativeness inInfonnation Technology (PIIT)	3	(Lu et al.. 2005)
Behavioural Intention	3	(De Ruyter et al., 2001)

Respondents Profile:

The participants in this study were from Delhi-NCR who are using after metaverse apps. And devices. The demographic characteristics are as follows: Males outnumber females, and the majority of responders fall between the 18–28 age range.

Data Analysis and Findings:

EFA and multiple regression was used to extract the constructs and examine the relationship between the variables and test the hypothesis. The value of KMO=0.839 (table-2) is more than the prescribed value of 0.6 (Field, 2009), and $\chi 2$ = 4223.604, (Degree of freedom) Df = 105, p<0.001 shows that connection between the statements is appropriate for further doing principal component analysis. The standard factor loading of each statement is more than 0.5 (table-3) (Hair et al., 2010) and for the sake of internal consistency the Cronbach alfa (α) value is considered and the value of each construct is more than 0.70 which is above the prescribed limit and considered reliable (George & Mallery, 2003).

Table-2
KMO and Bartlett's test

KMO and Bartlett's test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.839
Bartlett's Test of Sphericity	Approx. Chi-Square	4223.604
	Df	105
	Sig.	.000

Source: Analysis Output

Table-3
Factor Loading and Cronbach Alfa

Constructs		**Factor loading**
Perceived Usefulness (PU) (Cronbach's α = 0.814)		
PU I	Using the metaverse apps and devices increases my productivity.	0.824
PU2	Using the metaverse apps and devices enhances my effectiveness.	0.777
PU3	I find the metaverse apps and devices to be useful.	0.761
Perceived Ease of Use (PEOU) (Cronbach's α = 0.928)		
PEOU I	My interaction with the metaverse apps. and devices is clear and understandable.	0.827
PEOU2	Interacting with metaverse apps and devices does not require a lot of my mental effort.	0.946
PEOU3	I find metaverse apps and devices to be ease to use.	0.911
Perceived Enjoyment (Cronbach's α = 0.941)		
PE I	It is exciting to use metaverse apps and devices	0.893
PE2	It is fun to use metaverse apps and devices	0.883
PE3	Using metaverse apps and devices makes me enjoyable	0.781
Personal Innovativenes in Information Technology (PIIT) (Cronbach's α =0.939)		
PIIT1	If I heard about metaverse technology. I would look for ways to experiment with it.	0.880
PIIT2	Among my peers. I am usually the first to explore new technologies.	0.889
PIIT3	I like to experiment the metaverse apps and devices.	0.878
Behavioural Intention (Cronbach's α = 0.846)		
BI1	I will use metaverse apps and devices in the next months.	0.802
BI2	I predict that I will be using the metaverse apps and devices in next coming months.	0.810
BI3	I am planning to use metaverse apps and devices in coming months	0.856

Source: Anal sis Output

(Table-4) R-squared value of 0.276 is correlation coefficient this score indicates that consumers' behavioural intentions towards the use of metaverse app and devices can be predicted with a high degree of statistical significance. R-squared score is explaining 27.60% of variability of dependent variables which is significant.

Table-4
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.525 .	.276	.268	4.27404

Predictors:
(Constant), Perceived Usefulness, Perceived Ease of Use, Perceived enjoyment, Personal Innovativesss in Information Technology (PIIT).

(Table-5) reveals the score of the evaluation and analysis performed on the regression model, to see if it was suitable for the given data. (Table-5) reveals that the independent variables have a good chance of predicting how consumers would behave with respect to the adoption of metaverse applications and devices. The F statistic reveals that there is significant effect of factors on the dependent variable $(4, 360) = 33.798$, $P < 0.05$. It follows that the regression model is a good fit for the provided information.

Table-5
ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2748.806	4	617.403	33.798	.000[b]
	Residual	6503.367	355	18.267		
	Total	9252.173	359			

Dependent Variable:
Behavioural Intentions towards Adoption of metaverse apps and device. Predictors: (Constant), Perceived Usefulness, Perceived Ease of Use, Perceived enjoyment, Personal Innovativesss in Information Technology (PIIT).

Table-6
Coefficients

	Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.552	.844		4.211	.000
	PU	.241	.061	.221	3.929	.000
	PPEOU	.120	.044	.126	2.741	.006
	PE	.184	.051	.199	3.638	.000
	PIIT	.171	.052	.180	3.271	.001

Dependent Variable: Behavioural Intentions towards Adoption of Metaverse Apps and Devices.

Table-6 demonstrates that the p-value for (Perceived Usefulness, Perceived Ease of use, Perceived Enjoyment and PIIT) is 0.000, which is much lesser than the alpha value of 0.05. as a result, all four hypotheses (H1–H4) accepted because of the strong correlation between the dependent and independent variables.

Hence, this study's multiple regression equation:

Consumer Behavioural Intention towards Metaverse Apps. And Devices Adoption= 3.552 + 0.241 Perceived Usefulness + 0.184 Perceived Enjoyment + 171 PIIT +0.120 PEOU.

Table 6 shows that consumer behavioural intention to adopt metaverse apps and gadgets are positively correlated with perceived usefulness, followed by perceived entertainment, PIIT, and PEOU.

Discussions:

This research intends to improve academics' awareness of the factors prompting Generation Z's desire to embrace metaverse applications and devices, particularly in the Indian setting. Right now, India and several other emerging countries have quite low rates of adoption of metaverse apps and gadgets. It needs further research to find ways to inspire people living in such nations to use metaverse gadgets and applications. According to the findings, people's desire to use metaverse apps and devices is significantly influenced by their perceptions of its utility, simplicity of use, pleasure, and Personal Innovativeness in Information Technology (PIIT). The findings show that how easy, useful, innovative, and fun users think metaverse apps and gadgets has a big effect on whether or not they want to use them.

Theoretical and Managerial Implications:

This study builds on the TAM by using its ideas to look at how Generation Z uses new metaverse platforms. It shows how things like perceived usefulness, ease of use, perceived enjoyment, and PIIT affect people's intentions to use these new immersive systems *(Mardoyo et al., 2023)*. The findings contribute to the advancement of human-computer interaction theory by evaluating the continued utility of previous TAM forecasts in gauging the rate of adoption of evolving immersive technologies *(Bassiouni & Meshreki, 2025)*. The study might also find that different generations are more or less accepting of technology. This could mean that TAM needs to be expanded to include things like privacy concerns, virtual identity concepts, or experiential worth in order to better understand what makes younger people want to use the metaverse. These kinds of theoretical advances may help with future studies of extended reality technologies and the psychological reasons why people use them. For those in technology advancement and marketing spheres, this exploration provides applicable understandings into how to architecture and promote metaverse programs and gadgets intended for Generation Z *(Calderón-Fajardo et al., 2024)*. When convenience and perceived value are the driving factors, corporations ought to emphasize straightforward interfaces, evident functionality whether social, educational, or for fun (e.g., bonding with others, studying novel things, or being entertained), and seamless integration with existing digital behaviors *(Aburbeian et al., 2022)*. If societal impact plays a significant part, collaborations with influential figures and neighborhood-driven highlights could heighten reception. Moreover, businesses in electronic commerce, pedagogy, and virtual workspaces can leverage these revelations to customize metaverse Gen Z's preferred experiences include

gamification, customization, and deep social interaction *(Adhini & Prasad, 2024)*. Policymakers and instructors may also utilize these insights to address potential obstacles like digital literacy, availability, or principled issues, confirming accountable metaverse growth.

Limitations and Future Scope:

Its usefulness is restricted by the study's cross-sectional nature. More research with diverse people, locales, and cultures may be conducted in the future, considering the geographical limits of this study. Experimental research is another option for delving more into customer behaviour and the processes that follow. In future researchers may include more variables, such as gender and personality factors, for in-depth study. This study used quantitative methodologies. Since the use of metaverse apps and devices is still in its infancy in India, future studies may employ mixed-or qualitative-methodologies to thoroughly investigate the issue.

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