



## ANALYZING THE KEY DRIVERS OF METAVERSE ADOPTION IN INDIA USING THE BEST-WORST METHOD

**Lekhika Sharma**

Research Scholar, Department of Business Administration  
National Institute of Technology, Kurukshetra, India  
Contact no. 9888691304, [62210027@nitkkr.ac.in](mailto:62210027@nitkkr.ac.in)

**Neeraj Kaushik\***

Associate Professor, Department of Business Administration  
National Institute of Technology, Kurukshetra, India  
Contact no. 9996259725, [neeraj.kaushik@nitkkr.ac.in](mailto:neeraj.kaushik@nitkkr.ac.in)

### ABSTRACT

The study employs the Best-worst method (BWM) to analyze the factors influencing metaverse adoption in India. BWM is a Multi-Criteria Decision-Making (MCDM) technique that systematically prioritizes criteria by comparing the best and worst elements within a set of options. This study effectively identifies and ranks the key drivers of metaverse adoption based on expert opinions and extensive literature reviews. The analysis begins with the identification of relevant factors and their sub-factors, encompassing utilitarian, social, personal, and hedonic aspects. Through the BWM, the research quantifies the importance of each factor, revealing a hierarchical structure that highlights the predominance of utilitarian benefits over other dimensions. The results provide a robust framework for future research in similar contexts. Ultimately, the findings accentuate the need for tailored strategies to stimulate metaverse engagement among Indian users.

### INTRODUCTION

The word Metaverse has gained sudden hype in the recent years. Significant breakthroughs have brought the world to the era of cutting-edge Web 3.0 technology. The Metaverse is a rich virtual environment where users can create *Avatars* to communicate with other users and own virtual assets (Shukla et al., 2023). The metaverse is frequently viewed as the next advancement in online technology, permitting people to interact and engage in activities in real-time across geographical, temporal, and other boundaries [(Hennig-Thurau et al., 2023), (Verma & Sharma, 2023)]. Ever since Mark Zuckerberg, the founder of Facebook, declared that his company would become a "metaverse company" and subsequently renamed its name to "Meta," there has been a growing interest among the business community to gain further insight into this emerging phenomenon and its implications. Consequently, large corporations employ the metaverse as a new frontier to engage with their target audience through enlightening experiences (Bousba & Arya, 2022; Mishra & Dharmavaram, 2023).

In line with the Gartner report, Twenty-five percent of individuals will habitually dedicate an hour or more to working, shopping, studying, socializing, and enjoying themselves in the metaverse by 2026 (Rimol, 2022). This clearly foreshadows the demands of the metaverse in the near future. Leading IT companies are embracing the metaverse trend. Prominent players in the metaverse marketing space include Microsoft's enterprise metaverse, Facebook Horizon, and Nvidia's omniverse [(Dwivedi et al., 2022), (Tandon et al., 2023)]. In India, the metaverse is projected to develop into a \$1.11 trillion industry by 2032, ushering in a transformative wave that has the potential to reshape various sectors. This growth is anticipated to encompass training, education, gaming, entertainment, and business (Global talent exchange, 2024). Furthermore, Deloitte (2024) highlights that with over half of its population under 30 and a strong pool of STEM graduates, India is well-positioned to contribute significantly to the digital labor force needed for metaverse development. Prominent Indian companies such as TCS, HCL Technologies, and Wipro are among the pioneers in the adoption of metaverse technologies (Jaiswal, 2024).

Given the rapid proliferation of the metaverse, understanding the key drivers that shape its adoption in various contexts becomes crucial, particularly in emerging markets like India where the potential for growth and innovation is substantial. Despite extensive research on metaverse adoption using theories such as TAM (Wu & Yu, 2024), TPB (B.-H. T. Nguyen et al., 2024), UTAUT (Liang et al., 2024), UGT (Chakraborty et al., 2024), and DOI (Kumar et al., 2024; Pan et al., 2023) across various contexts and sectors, several key gaps remain, particularly in the Indian context. A major methodological gap exists because of the reliance of most studies on traditional survey methods to validate the established theories. While these theories focus relationships between variables, they fail to provide insights into the relative importance of factors. Additionally, a population gap exists, as few studies have focused specifically on metaverse adoption in India, a country with unique and diversified socio-economic and technological conditions. Lastly, a significant practical knowledge gap exists in India, where tech developers and industry stakeholders must prioritize the most critical factors influencing metaverse adoption to strategically allocate their limited resources and drive successful implementation (KPMG, 2022).

To address these gaps, Multi-Criteria Decision-Making (MCDM) techniques such as the Analytic Hierarchy Process (AHP) and Best-Worst Method (BWM) are promising solutions. Although AHP is widely regarded as a robust decision-making tool, it is complex and prone to inconsistency (Khan et al., 2020). The best-worst Method (BWM) (Rezaei et al., 2016) mitigates these issues by requiring fewer comparisons, saving time and resources, and allowing experts to make structured, reliable judgments about the prioritization of factors. Moreover, no study has used this technique in the context of metaverse adoption. Building on this, the current study utilizes the BWM methodology to identify and rank the factors pertinent to metaverse adoption in India, guided by the following research questions (RQs):

RQ1: What are the critical factors responsible for metaverse adoption in India?

RQ2: How can these factors be prioritized based on their impact on metaverse adoption in India?

The present study provides a systematic and robust framework to uncover the most important determinants of metaverse adoption, guiding stakeholders in India, including policymakers, technology leaders, and industry players. The structure of this paper adheres to a conventional format, beginning with a literature review. Subsequently, the research methodology, results, and discussions are presented. The paper concludes by offering theoretical and practical implications, addressing limitations, and suggesting directions for future research.

## LITERATURE REVIEW

### Adoption of Metaverse

As the digital landscape continues to evolve, the concept of the metaverse has gained significant attention, capturing the imagination of technologists, policymakers, and the general public alike (Mishra & Dharmavaram, 2023). The metaverse is a vision of a seamlessly integrated virtual and physical world, where users can interact, collaborate, and engage in a wide range of activities using immersive technologies such as virtual and augmented reality (Dwivedi et al., 2022). A significant number of studies explore metaverse adoption across various sectors, focusing on factors influencing user acceptance and engagement (L. T. Nguyen et al., 2023) investigate metaverse banking service adoption in Vietnam, proposing the UTAUMT model, which considers factors like performance expectancy, facilitating conditions, effort expectancy, social influence, trust, and financial resources<sup>1</sup>. Other research examines metaverse adoption in tourism, particularly among Gen Z and Millennials, analyzing their acceptance and use patterns (Calderón-Fajardo et al., 2024). Some studies concentrate on specific aspects, like Generation Z's intention to use digital fashion items in the metaverse (Adhini & Prasad, 2024). Additionally, the research explores the determinants of NFT creators' engagement behaviors on metaverse-based platforms, using a multi-analytical SEM-IPMA method. Adhini and Prasad (2024) analyze the perceptions and drivers of metaverse adoption, highlighting the role of perceived usefulness, personal innovativeness, social presence, telepresence, and regulatory support. Further, research examines consumer behavior towards retail metaverse banking, emphasizing the unique dynamics shaping

user responses (Kumar & Shankar, 2024). Roh et al. (2024) explore metaverse adoption patterns in emerging markets, focusing on the stimuli triggering user engagement and the resulting behavioral outcomes. Another study by J. Zhang et al. (2024) investigates metaverse tourism and the motivations of Gen Z and Gen Y, providing insights into their preferences and expectations towards this emerging form of travel. Building on this existing body of research, the current study aims to address

metaverse adoption in the context of India, a developing market where digital advancements are rapidly evolving.

### Factors and the sub-factors of Metaverse adoption in India

The following list presents the key factors and their corresponding sub-factors identified through an extensive literature review, along with valuable insights and feedback from experts in industry and academia.

Factors	Sub-factors	Description	Reference
Hedonic factors	Escapism (H1)	The need to escape the actual world into a virtual one that allows users to dissociate themselves from real life and experience something new.	(Hur & Baek, 2024; Jafar & Ahmad, 2024; D. Y. Kim et al., 2024; Pal & Arpnikanondt, 2024)
	Fantasy (H2)	It allows users to enter metaphysical and unreal experiences in the metaverse that they cannot experience in real life.	(Natarajan et al., 2024; Jiang et al., 2023)
	Entertainment (H3)	The fun and enjoyment the users have while using the metaverse, including games or interactive content.	(Cha et al., 2024; Jafar & Ahmad, 2024; Jiang et al., 2023)
	Aesthetics (H4)	The visual attractiveness and design components of the metaverse platform, include the overall ambiance and sensory experience of the environment.	(Lee, C. T., & Shen, Y. C. (2024); Luong et al., 2024)
Social factors	Social Presence (S1)	The feeling that one coexists with others within the metaverse experience is magnified even though it is virtual.	(Wu & Yu, 2024; G. Zhang et al., 2022)
	Social interaction (S2)	The avenues for users to interact with others through avatars, chats, and events in the metaverse.	(Hennig-Thurau et al., 2023; Wu & Yu, 2024)
	Social Influence (S3)	The effect of peers, influencers, or social collectives on an individual's choice to embrace and engage with the metaverse platform.	(Al-Adwan & Al-Debei, 2024)
Utilitarian factors	Content (U1)	The availability and diversity of useful information, tools, and resources in the metaverse, are perceived by users as helpful.	(Barta et al., 2023; Y. Park et al., 2023)
	Convenience (U2)	The intuitive interfaces and seamless operational performance provide accessibility and navigation in the metaverse.	(Chakraborty et al., 2024; Natarajan et al., 2024)
	Informativeness (U3)	The amount of information and knowledge provided in the metaverse that is useful to the users, ranging from product information, tutorials, and educational resources.	(Liang et al., 2024; Balakrishnan et al., 2024)
Personal factors	Perceived Familiarity (P1)	The degree of prior experience or acquaintance that an individual possesses regarding virtual environments and technologies.	(Roh et al., 2024; D. Y. Kim et al., 2024)
	Perceived Behavioral Control (P2)	An individual's conviction regarding their capacity to manage or maneuver their behaviors within the metaverse.	(Al-Adwan et al., 2024; Jo & Shin, 2024; B.-H. T. Nguyen et al., 2024; J. Zhang et al., 2024)
	Risk (P3)	The concerns about security, privacy, or uncertainty in using metaverse platforms, including data protection or financial risk.	(Kumar et al., 2023; Pillai et al., 2023)
	Technological Anxiety (P4)	The fear or apprehension users have for using new or complicated technologies, which could deter the adoption of these technologies.	(Pal & Arpnikanondt, 2024; Pillai et al., 2023)
	Flow (P5)	A condition of profound engagement or immersion that individuals encounter while navigating the metaverse, during which they may lose awareness of time and become entirely engrossed.	(Cha et al., 2024; Wu & Yu, 2024)

## RESEARCH METHODOLOGY

The study used a two-step methodology to assess metaverse adoption in India. The first phase involved an in-depth analysis of existing research on metaverse technology, requiring the authors to collaborate in brainstorming sessions to identify various critical factors. In the second phase, consultations were held with experts, industrialists, and academics from diverse sectors, including banking, retail, education, healthcare, textiles etc. The figure 1 presents a structured framework for evaluating metaverse adoption, starting with identifying key factors, followed by hierarchical analysis and pairwise comparisons, ultimately calculating global and local weights for providing essential and impactful findings.

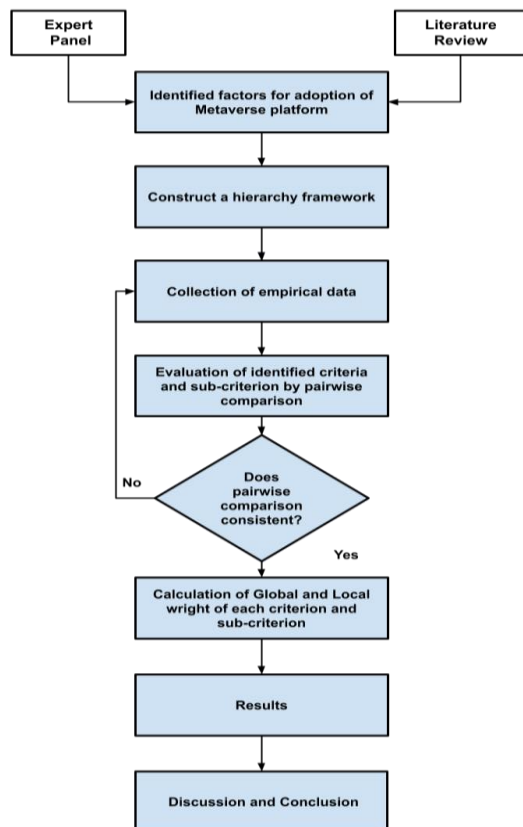


Figure 1: Flow chart of the research plan

### Identification of drivers

The drivers for the metaverse adoption emphasize the factors that are essential for the development of the metaverse platforms regardless of the sector or intended use. It focuses attention on creating a robust and adaptable platform, as the underlying technology and user experience are primitive to metaverse adoption. Whether applied in

industries like education, retail, hospitality, or entertainment, the platform itself serves as a backbone, facilitates variegated explications, and ensures a consistent user experience across different sectors. Considering this, an extensive literature review was conducted to identify the relevant factors. Subsequently, the identified factors were refined and finalized based on the opinions of experts, who provided valuable breadth of view to ensure their inclusion in the study (Table 1).

### Identification of experts

The selection of experts for this study was carefully curated to ensure a balanced representation of perspectives from both industry and academia (Table 2). A total of eight experts participated, comprising five industry professionals and three academic representatives. The industry experts specialized in immersive technologies, offering practical insights from sectors like virtual reality, augmented reality, and blockchain within the metaverse. Meanwhile, the academic experts, affiliated with reputable institutions, contributed theoretical insights on metaverse adoption. This blend of practical and theoretical expertise ensured a comprehensive evaluation of the factors influencing metaverse adoption in India.

Table 2: Details of the experts

Demographics	Category	Sample Size (N=8)
Gender	Male	6
	Female	2
Age	31-40	4
	41-50	3
	Above 50	1
Field	Industry	5
	Academia	3
Total Experience	Less than 6 years	3
	6 or more than 6 years	5

### Best-worst method

The Best-worst method (BWM) is a multi-criteria decision-making (MCDM) method designed for ranking and prioritizing alternatives (Rezaei et al., 2016). BWM simplifies decision-making by requiring only the identification of the best and worst criteria, rather than comprehensive pairwise comparison as in other MCDMs like Analytic hierarchy process (AHP) (Khan et al., 2020; Rezaei et al., 2016). This results in reduced data requirements, making the process more efficient for the analyst and the decision-

makers. The method uses a scale of 1 to 9 to determine the preference of the best criterion over all the criteria, and vice-versa (Khan et al., 2020). These preferences are then used to construct best-to-others and others-to-worst vectors. BWM then utilizes a linear programming model to determine the optimal weights for each criterion, ensuring consistency and minimizing inconsistencies that can arise from subjective judgments (Rezaei et al., 2016). By focusing on the extremes of best and worst criteria, BWM provides a more structured approach to pairwise comparison, leading to more reliable results with less data input. Although various studies have employed this method to analyze medical tourism (Abouhashem Abadi et al., 2018), industry challenges (Wankhede & Vinodh, 2021), and value consumption (Amoozad Mahdiraji et al., 2023), its application in the metaverse is still relatively limited. A study by (Yaman et al., 2024) prioritizes advertising appeals in the metaverse, while another explores the metaverse healthcare supply chain (Chen & Ruan, 2024). The current study aims to fill this gap by applying the method to assess

Within this category, informativeness (U3) is the most impactful sub-factor, boasting a local weight (LW) of 0.479 and securing both the top local and global ranks (1). Convenience (U2) follows with an LW of 0.265 and a local rank of 2, achieving a global rank of 3, while content (U1) holds an LW of 0.256, a local rank of 3, and ranks 4th globally.

Social factors rank second overall with a GW of 0.2154. Among them, social interaction (S2) stands out, having the highest local weight of 0.518 and ranking second globally. Social presence (S1), with an LW of 0.306 and a local rank of 2, secures the 7th global position. Social influence (S3) is less significant within this category, with an LW of 0.175, a local rank of 3, and a global rank of 9.

Personal factors ranked third overall, and have a GW of 0.1525. Perceived familiarity (P1) leads this category, with an LW of 0.316, local rank of 1, and a global rank of 8. Perceived behavioral control (P2) follows with an LW of 0.227 and a local rank of 2, reaching the 10th global position. Risk (P3), technological anxiety (P4), and flow (P5) rank lower both locally (3, 5, and 4 respectively) and globally

Factors	Sub-factors	Local Weight	Local Rank	Global Weight	Global Rank
Hedonic factors (Rank-2) (Weight 0.2311)	H1 Escapism	0.124	3	0.029	12
	H2 Fantasy	0.112	4	0.026	13
	H3 Entertainment	0.435	1	0.101	5
	H4 Aesthetics	0.329	2	0.076	6
Social Factors (Rank-3) (Weight 0.2154)	S1 Social Presence	0.306	2	0.066	7
	S2 Social Interaction	0.518	1	0.112	2
	S3 Social Influence	0.175	3	0.038	9
Utilitarian factors (Rank-1) (Weight 0.4011)	U1 Content	0.256	3	0.102	4
	U2 Convenience	0.265	2	0.106	3
	U3 Informativeness	0.479	1	0.192	1
Personal factors (Rank-4) (Weight 0.1525)	P1 Perceived Familiarity	0.316	1	0.048	8
	P2 Perceived Behavioral Control	0.227	2	0.035	10
	P3 Risk	0.198	3	0.030	11
	P4 Technological Anxiety	0.123	5	0.019	15
	P5 Flow	0.136	4	0.021	14

metaverse adoption in India, providing a comprehensive analysis of key factors influencing platform development across different sectors.

## RESULTS

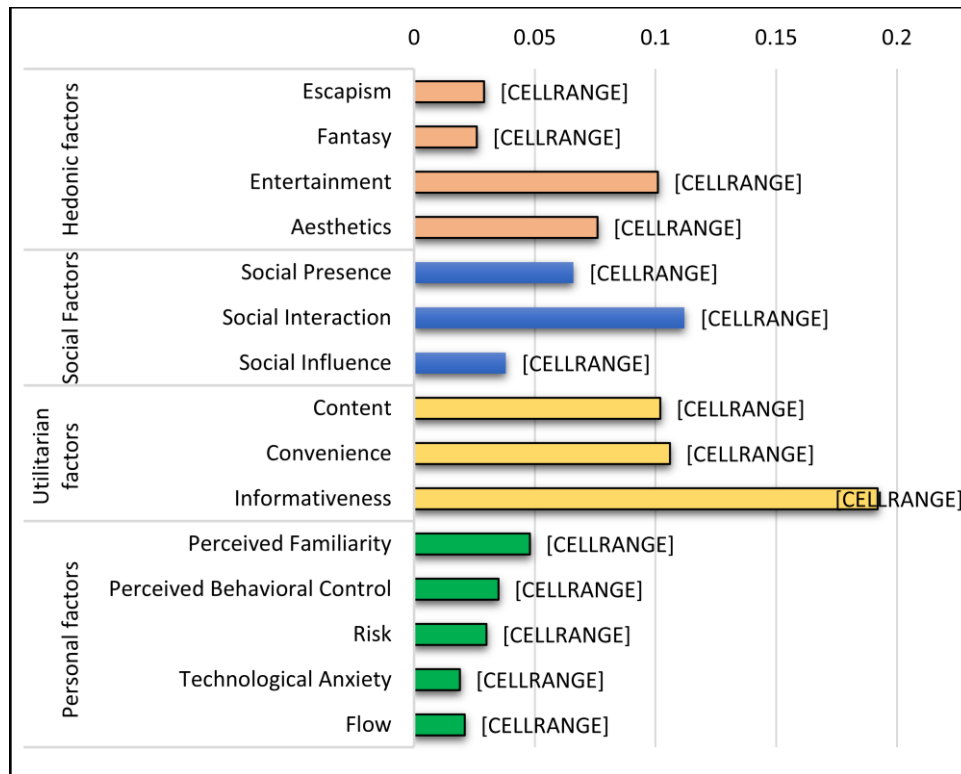
The results indicate a hierarchical structure in the factors influencing metaverse adoption in India, with utilitarian factors emerging as the most significant, holding a global weight (GW) of 0.4011 and ranking first overall (Table 3).

(11, 15, and 14), indicating their relatively lesser impact.

Hedonic factors rank fourth overall, having a GW of 0.2311. Entertainment (H3) is the most significant sub-factor, with an LW of 0.435, a local rank of 1, and a global rank of 5. Aesthetics (H4) follows, with an LW of 0.329, a local rank of 2, and a global rank of 6. Escapism (H1) and fantasy (H2) hold the least importance within this category, with local

weights of 0.124 and 0.112 and global ranks of 12 and 13, respectively.

supporting previous findings that ease of use boosts perceived utility and satisfaction



**Figure 2: Global weights of various sub factors**

The findings suggest that utilitarian aspects like informativeness and convenience play a crucial role in metaverse adoption, while social engagement factors, such as social interaction, also have a significant influence. These insights highlight the need for metaverse platforms in India to prioritize delivering functional benefits and fostering social connections to enhance adoption.

**DISCUSSIONS**

The findings of this study prioritize the factors influencing metaverse adoption and these aligns with existing literature, where the balance of these factors varies in driving user behaviors.

**Utilitarian Factors:** Informativeness was identified as the most significant factor, highlighting the importance of clear and accurate content in shaping user experiences. Rich content formats, including visuals, audio, and animation, enhance perceived value and uniqueness (Balakrishnan et al., 2024; Liang et al., 2024). Additionally, convenience, through user-friendly interfaces and seamless navigation, improves overall experience,

(Natarajan et al., 2024; Balakrishnan et al., 2024).

**Social Factors:** Social interaction plays a key role in metaverse adoption, fostering community through virtual engagement like collaborative work, conversations, and multiplayer gaming. Research highlights its impact on user intention to adopt and recommend the platform, with factors like avatar realism and real-time interaction enhancing social presence (Hennig-Thurau et al., 2023; Saleem et al., 2024). While social interaction is recognized as a major driver, further research is needed to explore how different engagements influence user behavior (Aiolfi & Luceri, 2024).

**Hedonic factors:** Entertainment is a major driver of metaverse adoption, offering immersive experiences for gaming, social interaction, and creative exploration (Calderón-Fajardo et al., 2024; Saleem et al., 2024). Engaging activities boost user satisfaction and platform retention (Ahn et al., 2024). Aesthetics, particularly digital fashion

and NFTs, add visual appeal, though opinions on NFTs vary (C. T. Lee & Shen, 2024; Luong et al., 2024). The metaverse also offers escapism, allowing users to disconnect from reality, though excessive escapism can lead to risks like addiction (Hur & Baek, 2024; Pal & Arpnikanondt, 2024).

**Personal factors:** The study found that personal factors like perceived behavioral control and familiarity moderately influence metaverse adoption. Users with a strong sense of control over navigating virtual environments are more likely to engage (Roh et al., 2024). However, concerns about data privacy and security deter some users, emphasizing the need for strong security measures (Abumalloh et al., 2023). While technological anxiety wasn't a primary focus, it may hinder adoption. Flow, driven by interactivity and social presence, boosts user satisfaction and platform retention (Cha et al., 2024; Liang et al., 2024). Theoretical and Practical implications

## CONCLUSION

This study identifies key factors influencing metaverse adoption and prioritizes them using the Best-Worst Method, highlighting the predominance of utilitarian benefits over hedonic experiences. By ranking these factors, the research deepens theoretical understanding and offers a framework for future studies. From a managerial perspective, organizations should focus on enhancing utilitarian features like informativeness and convenience while fostering social interactions. Addressing personal factors, such as technological anxiety, through training is crucial. Additionally, incorporating hedonic elements like aesthetics and entertainment enhances user satisfaction. Tailored marketing strategies can further promote metaverse adoption in targeted sectors.

## LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

This study identifies and prioritizes factors influencing metaverse adoption in India but has some limitations. The inclusion of eight experts, while valuable, could be broadened to improve generalizability. The qualitative approach lacks quantitative validation, limiting statistical confirmation of factor relationships. Future research could use surveys or modeling techniques and explore

applicability in other contexts. Longitudinal studies are also recommended to track evolving adoption factors as metaverse technologies develop.

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