Metaverse Mindset: A Catalyst for Superior Technological and Business Performance in Gaming Industry

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Keywords

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Abstract

An intimate environment for the business metaverse can be utilized to participate in virtual meetings with other users and it is critical in the current concept of online communication through video conferencing. From the stakeholder's viewpoints this study attempts to characterize the business position and the degree of urgency in riding the metaverse era. In this metaverse era, research on quantitative methods produces valuable data that can be used as a guide for creating organizations' roles. To answer the questions Partial Least Square Structural Equations Modeling (PLS-SEM) was carried out using a modified quantitative approach. The study findings indicate the organization does not always need to depend on outside factors to implement metaverse application. The findings are clear that human resource competencies to predict the future, balance knowledge and skill requirements, transmit a metaverse attitude, and spur creativity are also essential for the metaverse to advance along with technology. According to this study, it was obtaining that the factor in quantitative model had a significant impact with the goal to operate in the metaverse. It is proved that metaverse mindset has vital importance to promote technological performance and business performance in gaming industry of Pakistan.

Introduction

Computer science innovation play a very important role in our life now a day it helps to communicate with people in all over the world (Li, Zhang, & Li, 2009; Lyytinen & Rose, 2003). As we know that few years ago computer science got three big achievements' the passage of time which are very useful and appreciated by people all around the words which are mobile phone, personal computers and internet (Berdousis & Kordaki, 2015). But now a day they trying to focus on fourth wave of technology such as virtual reality (VR) (Mystakidis, 2022). In virtual reality we create realistic looking world with the help of computer graphics (Burdea & Coiffet, 2003). Computer displays the results according to user input commands. Organization adopt new technologies because organization not need only internal commitment to complete their projecting the metaverse but also the support of internal and external stakeholders (Chaudhuri, Dayal, & Narasayya, 2011) as displayed in Figure 1.

The numbers of metaverse platform increases day by day for the growth of organization in gaming industry. Platforms for games and virtual worlds like Roblox, the Standbox, Meta provide a multitude of opportunities from setting up a factory or a shop in the metaverse for business gathering and hosting conference (Papagiannidis, Bourlakis, & Li, 2008). The word metaverse was used to refer to a virtual environment that parallels and resemble the actual world and allow users to interact through avatars in Stephenson's 1992 novel snow crash (Besson & Gauttier, 2024). Metaverse is an idea that envisions completely hypnotic virtual space where people can communicate, generate content and participate with other people. Metaverse have a promise to revolutionizing wide area and introducing prospects of cooperation and creativity (O'Brien et al., 2021). Metaverse is a virtual world where users represented by avatars interact usually in 3D which mainly focus on economic and social connection (Mystakidis, 2022). We can enter metaverse worlds by using Virtual reality (VR) connection. It is like a digital escape hatch which allows users to immerse themselves in an online reality with other users from across the world (Wang et al., 2022). In simple it refers to the convergence of physical and virtual space accessed by computers which enable by immersive use of technologies such as VR (Narin, 2021). Now a days business in the era of metaverse is the topic of research and growing interest (Kraus et al., 2022).

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Figure 1: Metaverse Mindset.

Competition increases day by day and everyone wants to adopt new technology which helps to promote digitalization which leads to profit making (Cagnina & Poian, 2008). It is very important for businesses to understand new technologies which enable changes in overall organization. VR is a useful tool for object exploration, appreciation, and observation. This suggests that the metaverse era involves new methods for the growth of business (Papagiannidis et al., 2008). Metaverse helps businesses to switch from traditional to modern business. We virtually explain our new projects for better understanding. So, it becomes most important for businesses to adopt it. Every business has stakeholders either traditional or modern business. Likewise, metaverse business also has stakeholders internally or externally have impact on business performance (Wheeler & Sillanpa, 1998). Internal stakeholders involve employees, managers, suppliers, board members, owners, leaders (Ahmad, O'Regan, & Ghobadian, 2003). External stakeholders may involve trade unions, competitors, government regulatory agencies, communities, customers, creditors and so on (Harrison & St. John, 1996). Therefore, the research questions of the study are as follows:

1. Is there any relationship between metaverse mindset and business performance?
2. Is technology performance positively related to business performance?
3. Does human resource moderate any relationship between metaverse mindset and business performance?

Research questions of the study lead to the following research objectives:
1. To investigate the role of metaverse mindset in business.
2. To analyze the relationship between technology performance and business performance.
3. To analyze the analyze directly and inversely proportion relationship between technology performance and human resources.
4. To explore the metaverse factors influencing human resources.
5. To assess the effectiveness of metaverse mindset on business performance.

Literature Review

Metaverse Era

Recent development in VR and AR technology into strategies for marketing and practices has maximized the interest. These technologies are describe as a system that combine real and virtual world and enable interaction in real time and allow for precise 3D registration for virtual and real object (Yawised, Apasrawirote, & Boonparn, 2022). The fundamental of metaverse is stimulation, which involve life tracking, virtual world, augmented reality, and mirror world (Choi & Kim, 2017). Metaverse is a new era of communicating networking in every field of life like education, health, arts and business. Metaverse provides opportunities for the latest technologies such as artificial intelligence, block chain, digital device and NFTs but taking into considerations there is a lack of understanding to identify the changes in entrepreneurships. Figure 2 explains the metaverse business opportunities.

Figure 2: Metaverse Business Opportunities.

Metaverse and Business Industry

In the digital era study on human and business non-financial working increase and it play a vital role for the growth of business (Minkes, Small, & Chatterjee, 1999). The literature

review on metaverse and business performance tells us the existing studies available on these topics discuss different theories and style which have impact on business effectiveness and also innovate new theories in the era of digitalization. According to recent studies effective digital business require a combination of technical proficiency, problem solving abilities, flexibility and quick decision making. In simple terms we say that it highlights the importance of digital transformation and digital business in the current era (Promsri, 2019). The literature also highlights how important digitalization for the establishment of positive customer experiences perspectives and handling the problems in digital transition (Mihardjo et al., 2019).

The metaverse in the era of digital highlights the importance of developing skills which help to adopt rapid change in the field of technology because metaverse is the new era of networking and computing which have significant impact on various fields (Wang et al., 2022). It provides new opportunities for making more profit because there is no need of physical display of your project which reduce our operational cost when we use metaverse (Ng et al., 2023). The literature review highlights the need for further research on metaverse impact on different fields and develop new ideas which help to solve the problems and challenges present in current era. In the digital era now a day it is most important to introduce new skills in business and also develop modern theories which differentiate modern business from traditional business. The literature reviews also focus on managing the challenges towards transformation and developing decentralized system which facilitate stakeholders.

Conceptual Framework

Metaverse is not only technology or a new world it provides us a virtual world which is similar to reality (Han, Bergs, & Moorhouse, 2022). Man play several roles as a human in the metaverse. Human play a role as a driver. Leaders play an important role in driving organization towards success through mission and vision they create as an organization target. Leaders serve as an organization controller (Model, 2023; Sanusi, 2015; Yang et al., 2019). Responsible for directing and guiding the efforts toward achieving organizational goal. Leaders have also control the internal politics of the organization. Leaders play an important role as creating and transferring vision. It means leaders explain the vision of the organization in simple term so that everyone easily understand it also share his experience and knowledge so they learn and do better job. Leader work as a situation saver. Researchers can explore the relationship between business performance and

crisis management which highlighted different managing style and how an experience human resource capable of handling crisis situation.

After through study and researcher point of view we highlight human resources and its role, and how it become helpful for achieving transformation (Rothwell, Prescott, & Taylor, 2008). Business transformation has been driven with the help of metaverse proposed by a human (Asad et al., 2021). Various positive impact of metaverse drives which are highlighted below.

1. Knowledge and skill
2. Education and onboarding experience
3. Collaboration across team
4. Product development
5. New revenue stream opportunities

In this paper study present the researcher arguments that individual is the basic source of the adaptation challenge for business actors in that era. The leader try to overcome the metaverse challenges become successful in promoting knowledge and skills (Dwivedi et al., 2022). The metaverse facilitated through different platforms in education and experience building (Gu et al., 2023). Metaverse in business refers to business strategies and practices employed within virtual world. Researcher in this area is still important but study on virtual world is insightful information. It is most important for metaverse leaders to understand technological aspects of virtual environment, achieving collaboration between team members and tackle the opportunities and challenges comes in virtual environment (Israfilzade, 2022).

The researchers evaluate the role of human in metaverse business. Leaders have a strong impact on the organization performance such as achieving vision and mission statement, controlling organizational environment (Muafi & Setyaningrum, 2022). The analysis declares that the metaverse leader have a strong visionary capability so that the leader is able to see different opportunities and threat in future which cannot be predicted by any team members. As we known goal setting theory tells us that setting specific and clear goal can help to enhance motivation and task performance (Piccolo & Buengeler, 2013). When team members clearly know the vision and goal of the organization it provides them motivation and direction to perform their duties which help lead towards goal achievement (Baum, Locke, & Smith, 2001). The results of this research have been verified by different literature conducted over time with homogenous results. Leaders skill and knowledge helps the organization to move towards transformation. Framework of the study is reported in Figure 3.
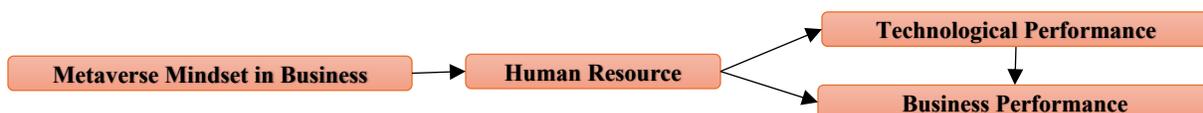

Figure 3: Framework of the study showing the relationship between Metaverse Mindset in Business, Human Resource, Technological Performance and Business Performance.

Aforementioned discussion and framework of the study in Figure 3 lead to the following research hypotheses:

Hypothesis (H1): *Metaverse mindset in business is positively related to human resources.*

Hypothesis (H2): *Human resources are positively related to technology performance.*

Hypothesis (H3): *Human resources are positively related to business performance.*

Hypothesis (H4): *Technology performance positively related to business performance.*

Hypothesis (H5): *Human resources mediate the relationship between metaverse mindset in business and technology performance.*

Hypothesis (H6): *Human resources mediate the relationship between metaverse mindset in business and business performance.*

Research Methodology

In this study the researcher use quantitative methodologies techniques which combine components in one investigation. By combining the advantages of quantitative approaches method research aim to improve the understanding of the study problem (Santiago, 2022). The purpose of acquiring particular competences and skills to effectively lead in a technical environment which quickly highlighted by technology in digital era (Banks et al., 2022). Many competencies are highlighted which help us in problem solving, decision making,

technical abilities and so on. The research model (refer Figure 3) indicates that all the constructions elements modified from previously used scales. Four items are used to determine business performance taken from Samiee and Roth (1992). Four items are taken to measure technology performance from Zahra et al. (2019). Four items are adopted (Liu et al., 2023) were constructed to measure human resources. Five point Likert-type scale with strongly disagree and strongly agree as its anchors were used to measure each dimension. All of the constructions operational definitions include metaverse mindset, technology performance, business performance, human resources. Halcomb work on mixed method research that involve use of quantitative data collecting and analysis techniques which provide more comprehensive understanding of the problem (Halcomb, 2019). The quantitative approach explores the role of metaverse in the business in that era. Analyzing the research data begins with and determining the role of metaverse competencies and role formulated by metaverse business stakeholders. The responses are used to determine the weight of metaverse role in the modern era. Finally, questionnaires were distributed among the owners of various businesses related to the gaming industry in Pakistan and 421 responses were used in data analysis. Table 1 explains the descriptive information of the data.

Table 1: Data Statistics.

	Missing	Mean	Median	Min	Max	Standard Deviation	Excess Kurtosis	Skewness
MMB1	0	3.64	4	1	5	1.201	-0.603	-0.532
MMB2	0	3.75	4	1	5	1.165	-0.592	-0.586
MMB3	0	3.581	4	1	5	1.149	-0.612	-0.443
MMB4	0	3.606	4	1	5	1.154	-0.622	-0.419
HR1	0	3.665	4	1	5	1.136	-0.324	-0.606
HR2	0	3.797	4	1	5	1.113	-0.117	-0.723
HR3	0	3.597	4	1	5	1.219	-0.744	-0.49
HR4	0	3.487	4	1	5	1.198	-0.505	-0.535
TP1	0	3.589	4	1	5	1.167	-0.488	-0.539
TP2	0	3.822	4	1	5	1.102	-0.057	-0.77
TP3	0	3.725	4	1	5	1.111	-0.273	-0.596
BP1	0	3.678	4	1	5	1.138	-0.234	-0.645
BP2	0	3.674	4	1	5	1.097	-0.223	-0.624
BP3	0	3.564	4	1	5	1.175	-0.578	-0.5

Note: MMB = Metaverse Mindset in Business; HR = Human Resources; TP = Technological Performance; BP = Business Performance.

Data Analysis and Findings

Since the PLS-SEM is regarded as a well-liked and sophisticated estimation technique in the business (Hair Jr, Howard, & Nitzl, 2020; Kock, 2015; Matthews, 2017; Streukens & Leroi-Werelds, 2016), it was used for data analysis utilizing Smart PLS 4. To find loadings, path coefficients, and the corresponding significant levels, the PLS algorithm was employed, followed by bootstrapping approaches. The structural model assessment was used to evaluate the measurement model.

Results of Measurement Model Assessment
Convergent Validity

This research included analysis of the items cross loading.

Loading estimation should preferably by 0.70 or higher. In the interim, the low factor loading goods ought to be eliminated. Additionally, each item in a construct has to have a substantial strain on the corresponding construct. The factor loadings of every item in this study were greater than the loadings from threshold. Since each indication was loaded into its underlying construct, there were issue with no loading between the indicators. Measurement model is given in Figure 4.

After evaluating the measurement model, loadings, average variance (AVE), and composite reliability (CR) were used to evaluate convergent validity. In Figure 4, the measurement model is shown. Table 2 shows that majority of factors loadings were higher than the suggested value of 0.60 for every item. Furthermore, every Cr value was higher than the suggested

threshold of 0.70. Furthermore, every single AVE value for every under-studied component above the suggested threshold of 0.50. Additionally, Cronbach's alpha was used to assess the instrument's dependability. Reliability over 0.80 is seen as good, reliability between 0.70 and 0.70 is deemed acceptable, and reliability below 0.60 is regarded poor. For five variables, the Cronbach's coefficient estimations were more than 0.70 indicating that they were acceptable.
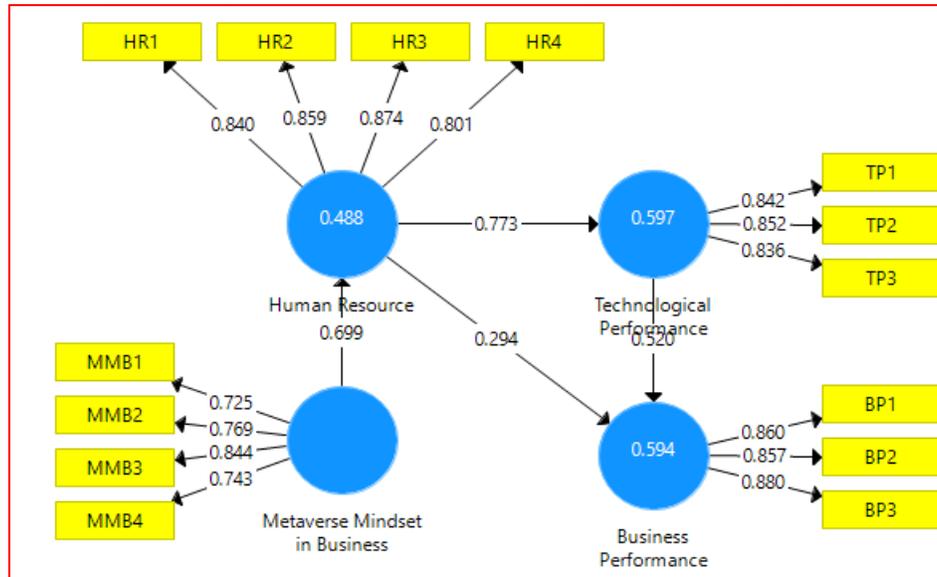

Figure 4: Measurement Model Assessment.

Note: MMB = Metaverse Mindset in Business; HR = Human Resources; TP = Technological Performance; BP = Business Performance.

Table 2: Factor Loadings.

Variables	Items	Loadings
	BP1	0.86
Business Performance	BP2	0.857
	BP3	0.88
	HR1	0.84
Human Resource	HR2	0.859
	HR3	0.874
	HR4	0.801
	MMB1	0.725
Metaverse Mindset in Business	MMB2	0.769
	MMB3	0.844
	MMB4	0.743
	TP1	0.842
Technological Performance	TP2	0.852
	TP3	0.836

Note: MMB = Metaverse Mindset in Business; HR = Human Resources; TP = Technological Performance; BP = Business Performance.

Table 3: Alpha, Composite Reliability and AVE.

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Business Performance	0.833	0.834	0.9	0.749
Human Resource	0.865	0.866	0.908	0.712
Metaverse Mindset in Business	0.773	0.784	0.854	0.595
Technological Performance	0.798	0.803	0.881	0.711

Discriminant Validity

The degree to which a variable is genuinely different from other variables is known as discriminant validity (Henseler, Ringle, & Sarstedt, 2015). For this study, there were two methods that were preferred to assess discriminant validity the Heterotrait-Monotrait Ratio (HTMT) (Henseler et al., 2015) and the Fornell Lacker Criterion (FLC) (Owusu-Acheampong & Antwi, 2023). The square root of the AVE for each construct was used to calculate the discriminant validity using the FLC, and the results were compared to the parallel values of the other variable (Fornell & Larcker, 1981). In the correlation matrix, the AVE square root quantities were shown along the diagonal. To prove discriminant validity, the square root AVE values have to be greater than the squared correlation estimations (Henseler et al., 2015). The AVE square roots values in the investigation were higher than the correlation between each construct. In the corresponding rows and columns, every diagonal element was greater than every off-diagonal element,

indicating sufficient discriminant validity for every construct.

FLC is one of the most useful techniques for assessing discriminant validity and offer a new and improved criterion (HTML) to evaluate the discriminant validity (Henseler et al., 2015). Nevertheless, the FLC does not evaluate the absence of discriminant validity in diverse research scenarios. As a result,

Table 3 present the results of the HTML, which was utilized to evaluate the constructs discriminant validity. Gold, Malhotra and Segars (2001) advised that all values be less than 0.90. As a result, discriminant validity for all constructs had also been established.

Table 4: Heterotrait-Monotrait Ratio (HTMT).

	Business Performance	Human Resource	Metaverse Mindset in Business	Technological Performance
Human Resource	0.82			
Metaverse Mindset in Business	0.671	0.844		
Technological Performance	0.816	0.716	0.835	

The PLS-SEM Results

Following the evaluation of the measurement model (see Figure 5), the PLS-SEM was carried out. For this reason, path coefficients, t-values, and standard errors were used to evaluate the models relevance. Using Smart PLS 4 for the bootstrapping process, the hypotheses were examined for both direct and

indirect effects (Sleimi & Okechukwu Lawrence, 2017). In terms of company performance, the relationship between metaverse mindset and business performance was considerably mediated and explain by technology performance and intervention of human resources (Hutahayan, 2020).
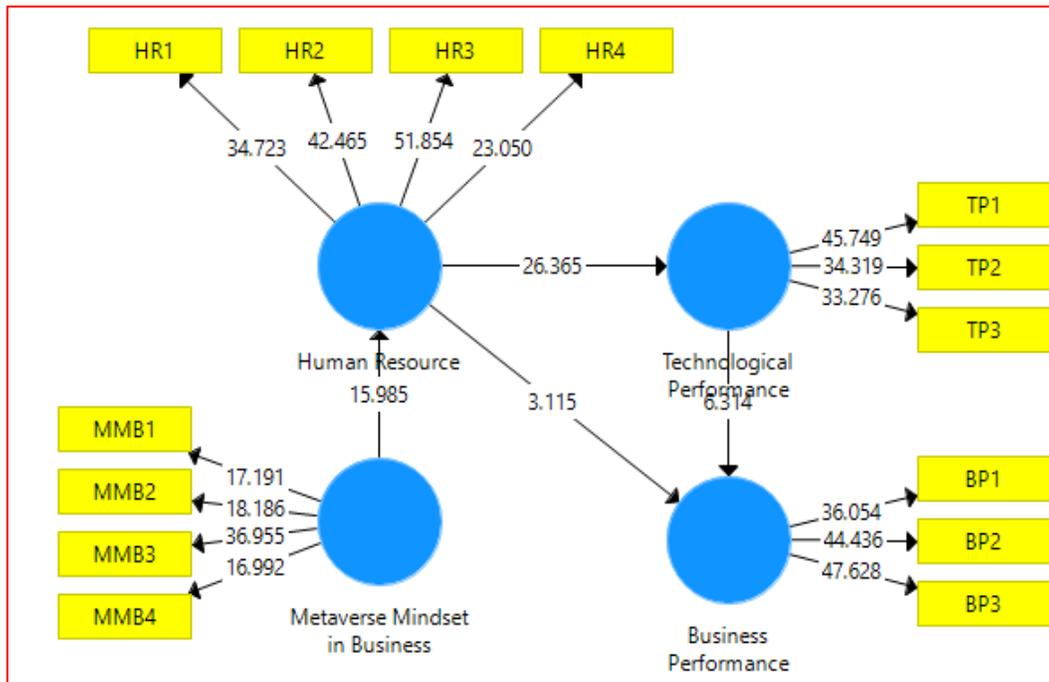

Figure 5: Structural Model Assessment.

Note: MMB = Metaverse Mindset in Business; HR = Human Resources; TP = Technological Performance; BP = Business Performance.

Human resources had a significant effect on the relationship between business performance and technological performance (β =0.2, t=3.11) and relationship between metaverse mindset in business and human resource (β=0.77, t=26.365). Direct

relationship between technological performance and business performance (β=0.52, t=6.314). These results are also reported in Figure 6 along with Table 5.

Table 5: Results (Direct Effect).

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Human Resource -> Business Performance	0.294	0.295	0.095	3.115	0.002
Human Resource -> Technological Performance	0.773	0.777	0.029	26.365	0
Metaverse Mindset in Business -> Human Resource	0.699	0.704	0.044	15.985	0

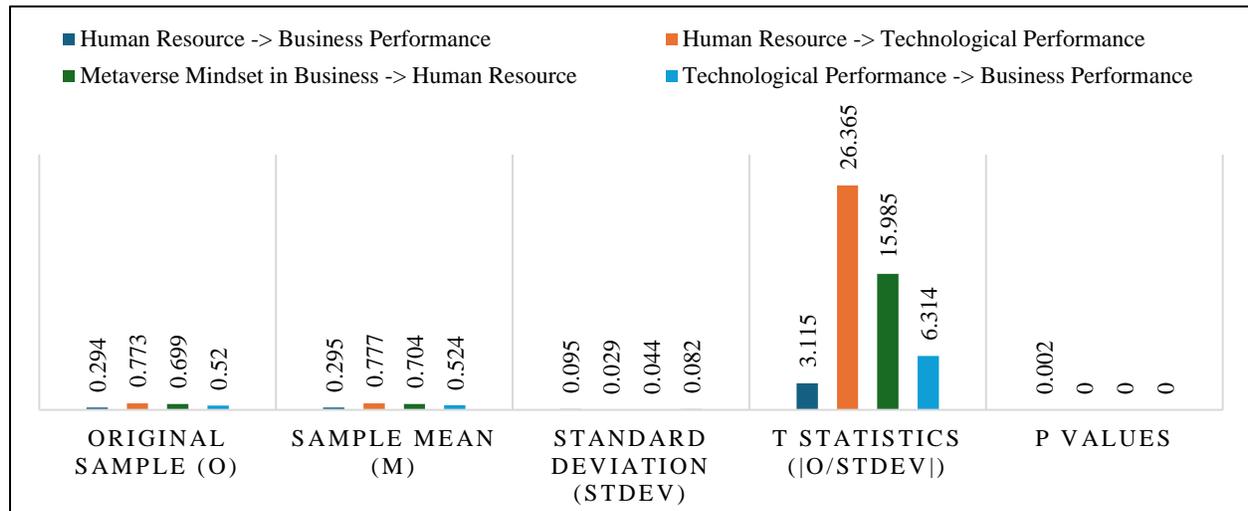| Technological Performance -> Business Performance | 0.52 | 0.524 | 0.082 | 6.314 | 0 |

Figure 6: Direct Effect Results.

Hypotheses of the study were examined for the direct and mediation effects of human resource on metaverse mindset in business and technological performance (β=0.54, t=11.44), indirect relationship between metaverse mindset in business and business performance mediated by human resource (β=0.20, t=3.14). Indirect effect results are given in Table 6 and Figure 7. Both indirect effect histogram are also reported in Figure 8 and Figure 9.

Table 6: Results (In-Direct Effect/Mediation Effect).

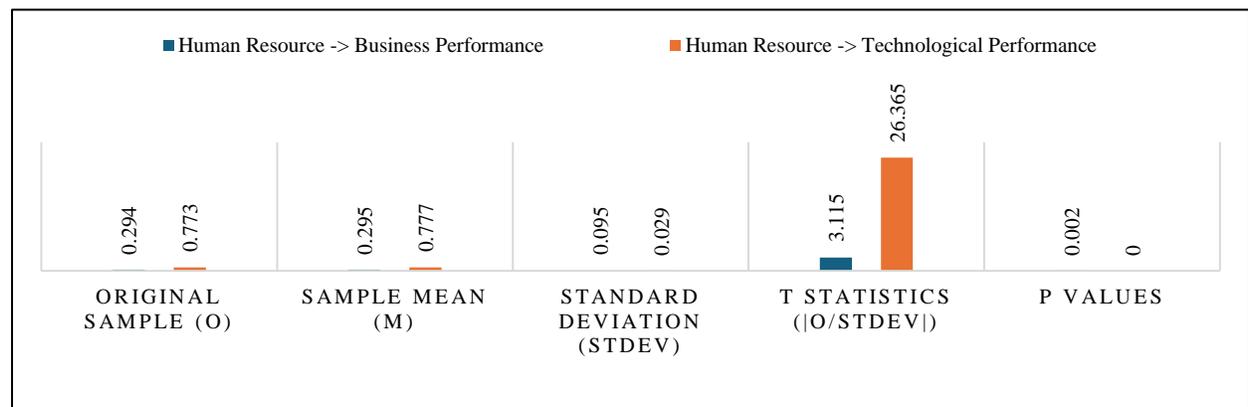|	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Metaverse Mindset in Business -> Human Resource -> Technological Performance	0.54	0.547	0.047	11.447	0
Metaverse Mindset in Business -> Human Resource -> Business Performance	0.206	0.207	0.065	3.141	0.002

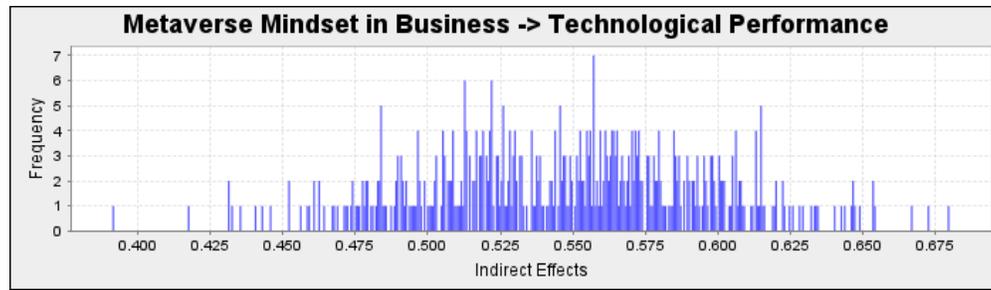
Figure 7: In-Direct Effect Results.

Figure 8: Mediation Histogram (Metaverse Mindset in Business -> Human Resource -> Technological Performance).
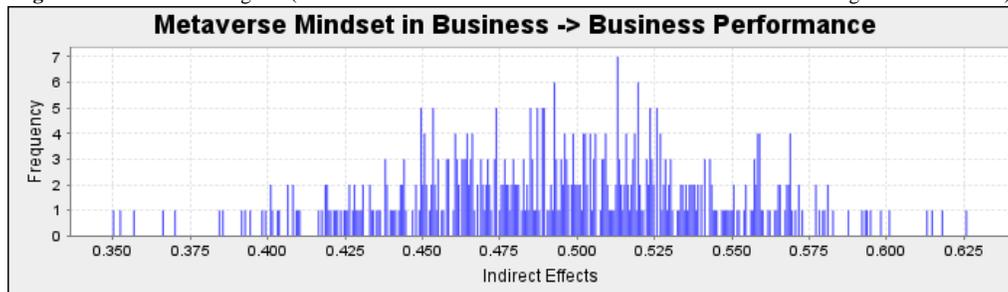

Figure 9: Mediation Histogram (Metaverse Mindset in Business -> Human Resource -> Business Performance).

Discussion

Now a day many organizations try to move towards digital transformation due to digitalization of technology and customers demand for something new in gaming industry. We have not only digital equipment's but also require human resource who have a mindset in the line with technology development (Zvarikova, Cug, & Hamilton, 2022). A digital mindset is a key component for organizations who are moving toward digital transformation from traditional business (Krishna, Anand, & Chamkha, 2019). Digital mindset helps us towards understanding metaverse technology which make the process of converting into digitalization more quickly and help to understand metaverse components in business (Yawised et al., 2022) like as Non Fungible Token, Block chain, Augmented Reality, virtual reality, extended Reality, Cyber security and cloud Computing. According to finding of study the metaverse mindset is based on numbers of features such as hard skill, attitude, soft skills, knowledge. Basically development of metaverse is in fact development of human itself (Said, 2023). It all comes down to human psychology. Even this generation Z facing a lake of digital attitude which is due to their limited experiences (Lamba & Malik, 2022). Yet this is like a basis for metaverse mindset.

As we now that after through study of stakeholders the knowledge of metaverse increases day by day but attitudes and skills remains the same which becomes a problem for a leader to manage the attitudes of team as well as progress (Kanematsu et al., 2009). The knowledge of metaverse and digital transformations is available but applications, software and scale of measurements is still underlying study. Basically metaverse day by day moving towards growth because it creates new job opportunities for young generation which have both specific skills and knowledge (Lee et al., 2022). Advancement in technology is mostly linked to altering of human roles (Stone et al., 2015). Many artificial intelligence technologies able to perform some technical activities rather than a human resource (Lam et al., 2022). Many researchers prove that human resource are the key of transformation (Fenech, Baguant, & Ivanov, 2019). Various characteristics and uniqueness of people in the organizations help out for transformation specially now a day where demand of human role is high (Zhang & Chen, 2023). Human have power to control the internal peace of the organization. So metaverse is not a critical problem which operates by a people who have an eye towards distant future (Cho, tom Dieck, & Jung, 2022). But it become a disruption for people who have no interest regarding organizational change.

Conclusion

The conclusion of this research tells the power of human as a leader who help the organization to drive in metaverse era. Frist the metaverse concept was basically focus on the advancement of cutting edge technology which leads to virtual environment in gaming industry. The stakeholder's discussion in this paper which include academics, IT professional, and representatives of META. At the end conclusion is that human dominated the development of the metaverse era. The role of leader is defining in 4 parts create vision, drive the goals, organization savers and control, situation saver this function is indicated by the addition of abilities and knowledge which lead to more employment option for people and reducing cost of product life cycle and supply chain. The role of technological performance in the exposure of metaverse rated as outstanding by researchers as well.

Implications of the Study

Theoretical framework was introduced in this investigation

for understanding a relationship between various constructs (metaverse mindset in business, human resources, technological performance, and business performance) to explore business advancement in service sector of Punjab. This investigation introduced a relatively new debate on the connection between metaverse and business performance in gaming industry. Many studies has been carried out in the service sector in the relation of human resource and business performance but ignored the metaverse mindset in business with business performance. It explores how metaverse mindset in business and its factors influence business performance. The present study fill the knowledge gap in relation to service sector industry because it is the first research study based on survey experiment to inspect the association of metaverse mindset in business key drivers with business performance in the Punjab hotels. In overall literature, only few experiments which address the trends of metaverse mindset in business in service sector. None of the study have directs on viewing metaverse mindset in Punjab. Therefore, the relationship of 6 proposed hypothesis help to the development of generalization across different related steams of research and also filling the current gap in service sector. Present investigation has a great possibility for the service sector literature.

Limitations and Future Pathways

Even though the present study provide has provide new insight into the current topic which is described above, it still has a certain drawback that would be better to handle as potential for future research. Frist the study finds the role of metaverse mindset in business it also requires to consider other mandatory considerations which are very important to facilitate the business. Second, my study only covers services sectors and cannot be applicable in other sectors in business, therefore, it is very important to cover manufacturing sector. Third, this study is carried out on a specific province of Pakistan, in future it will be very important to cover whole country.

Acknowledgement

CRediT Authorship Contribution Statement

Mahreen Qasim: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing original draft, Writing review & editing.

Declaration of Competing Interest

The author states that there are no relevant conflicts, either financial or non-financial, to disclose.

Funding

Ethical Statement

This research followed ethical guidelines, and ethical approval was not required as it did not involve human biological materials.

Data Availability Statement

The data supporting the conclusions of this study are available from the corresponding author upon reasonable inquiry.

Artificial Intelligence/ Language Module Statement

This research has been conducted independently of AI or LLM tools, and the author takes complete responsibility for the publication's accuracy and integrity.

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