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# The Impact of Metaverse on Work Life: A Delphi Study

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***Abstract*— The rapidly changing and evolving technology profoundly impacts various aspects of our lives, ranging from our living arrangements and modes of transportation, to the food we consume and clothing we wear, even extending to our relationships with pets, the visions of companies, and the constitutional integrity of countries. The potential of technology to fundamentally transform our living spaces, behaviours, and habits is immense. This study investigates the relationship between working life and the Metaverse, widely regarded as one of the most significant technological advancements of our era. The Delphi technique was used as the research method in this study. Expert opinions were collected to gain insights into the key strengths and weaknesses of the Metaverse in the workplace, as well as the potential threats and opportunities it presents in working life. A total of 52 predictions were analyzed in three rounds of discussions. Although complete consensus could not be reached for six predictions concerning the weaknesses and threats posed by the impact of the Metaverse on working life, experts reached a consensus on 46 predictions.**

***Keywords*— Metaverse, Work Life, Artificial Intelligence, SWOT, Delphi**

## I. INTRODUCTION

Human beings are constantly evolving and changing from the moment of birth. In today's world, the primary driving force behind human progress is our collective ability to proficiently harness technology. Efficient utilization of technology brings forth numerous benefits to humanity. However, these advantages are not equally accessible to all. Throughout history, those who have wielded the power of technology have gained significant advantages over other groups by embracing innovation and technology.

Theoretically, the possibility of establishing a connection between a human brain and a computer, generating artificial signals capable of evoking sensations, emotions, and entirely fabricated memories, raises a challenge for humans to distinguish between what is real and what is artificial. Therefore, it can be argued that the starting point of virtual reality studies revolves around the question of whether humans can discern what is genuine from what is artificial. Coined by Jaron Lanier, virtual reality is also referred to as virtual environment, cyberspace, virtual world, and artificial reality [1].

Understanding how the human sensory and perception system functions in the real world is crucial for comprehending the design and operation of virtual environments. The functioning of our sensory system relies on the nerve system within our bodies, stimulating the neurons in our brain through electrical signals, thereby triggering our perception. These signals enable us to perform mechanical movements such as blinking our eyes, lifting our feet, and chewing. All forms of information that reach our senses and nerve system are processed within our brains, enabling the perception mechanism to immerse us in the realities of life. Therefore, if the human brain is stimulated artificially, it becomes possible to experience non-existent sensations such as artificial images, sounds, smells, humidity, temperature, and tactile sensations as if they were real. When the artificially created information possesses the level of detail comparable to the perceptual capacity of human sensory organs, these perceptions can feel extraordinarily realistic.

In virtual reality, users are provide with a visual experience through a display screen. Advanced virtual reality technologies incorporate systems that stimulate multiple senses including hearing, smell, touch, temperature, humidity, and movement. Therefore, it would be incorrect to categorize virtual reality as an unreal perception. Instead, virtual reality is what users generate in their minds, outside of reality, as they interact with real-time simulations through various sensory channels such as sight, touch, hearing, smell, and taste, facilitated by special devices [2].

To grasp the concept of the metaverse, it is important to consider another significant concept known as "Augmented Reality" (AR). AR technology aims to enhance and enrich the environment through information technologies. The main distinction between AR and virtual reality is that AR enriches and diversifies the real world, while virtual reality applications completely detach users from their physical environment. A person using AR technology can witness virtual additions and diversifications within their current physical environment. AR serves as an extension of virtual reality by integrating two and three-dimensional virtual data with human-computer interaction techniques, sensing technologies, and computer and multimedia technologies, into the user's physical environment [3].

The metaverse is recognized as a novel Internet paradigm that allows people to create virtual reality through a head-mounted display, offering an immersive alternative virtual world for play, work and socializing [4]. In this virtual world, users interact through avatars, acting as their second persona, engaging with others and experiencing a real sense of presence in a three-dimensional non-realistic environment [5]. The metaverse is considered a broader concept than virtual reality.





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The term "Metaverse" was first introduced in Neal Stephenson's 1992 science fiction novel, Snow Crash, depicting a computer-generated three-dimensional virtual world where all content is created by its inhabitants. The term "Metaverse" originates from the combination of the Greek prefix "META" and the English word "UNIVERSE." The Greek prefix "META" is similar to the Latin prefix "POST" and means "itself, after, beyond." When paired with the English word "universe", it conveys the concept of "a universe beyond the universe". The Metaverse described in the book envisions a computer-generated three-dimensional virtual world. Recently, we have witnessed the potential of conducting commercial transactions using avatars in the metaverse, including buying and selling digital artworks called NFTs (Non-fungible Tokens), shopping for clothing, and attending virtual concerts and sports events, providing a genuine sense of presence. [6]. On the other hand, there are sociological studies evaluating the opportunities and threats posed by the metaverse [7].

Ball's definition of the metaverse characterizes it as a massively scaled and interoperable network of real-time rendered 3D virtual worlds and environments, offering an effectively unlimited number of users an individual sense of presence and continuity of data, including identity, history, entitlements, objects, communications, and payments [8]. In addition, Edelman defines the metaverse as a constantly existing social cyberspace where people or digital avatars can work, socialize, and hang out. The shift toward online activities, particularly due to the Covid-19 pandemic, has paved the way for the development of the metaverse universe [9].

In order to reveal how the metaverse, as a realm where people can work, will affect work life, attract users' attention and be strategically employed by organizations, it is necessary to examine potential revenue streams. According to the Marabelli and Newell, this situation can be compared to the evolution of business models with the effect of social media. Similar to the evolution of business models with the advent of social media, the relationship between working life and the metaverse exhibits similarities and differences.: (i) social media mostly works asynchronously, in 2D, and is not as immersive as the metaverse (ii) Metaverse works in 3D in real time, enabling users to interact more actively by focusing on the action performed. (iii) While social media platforms are constantly accessible via smart devices, accessing the metaverse requires wearing additional devices such as headphones/glasses, which can limit the time one can spend on the platform. This situation can be seen as a barrier to potential metaverse dependency [10].

In terms of the emergence of new business models, just as social media business models and the metaverse are similar or differentiated, there is a similar relationship between working life and remote work in the metaverse when we look at it from the point of work life. Today, many businesses have adopted remote working, online meeting, and instant messaging tools/applications. In addition, methods such as tracking mouse movements and measuring online time in the system are used to measure employee performance [11]. In the metaverse, there are similar situations in working life. Companies will be able to monitor their employees and collect huge amounts of biometric data through wearable devices [12].

The substantial and detailed data collected from metaverse business models necessiate companies in the information technology field to develop new products and make investments. Examples include providing online space rentals for companies to manage remote work, creating advertising-oriented models for retail businesses, and establishing common access protocols between platforms that allow users to move from one platform to another, encouraging online shopping and delivering immersive experiences [10].

In the study conducted by Wang et al. on remote working during the pandemic period, the main challenges faced were work-home interference, ineffective communication, procrastination, and loneliness [13]. Furthermore, working in the metaverse has the potential to create a dynamic, 3D simulation of the workplace environment, transcending the mere routine of checking mailboxes or attending meetings on online platforms.

This study aims to examine the potential effects of technological changes and the emerging new world order, particularly the metaverse, on people's work life. It investigates the root causes of negative outcomes such as increasing unemployment rates, widening social class disparities, income reductions, and decreased happiness. It seeks to answer the popular and frequently debated question of "What kind of work life can humanity expect in the metaverse?"

## II. Research Method

The Delphi technique was used as the research model. The Delphi technique, which is evaluated within the scope of qualitative research method and helps to determine future predictions with specific systematic processes, aims to collect creative and reliable information from individuals by examining their decision-making processes. The Delphi technique aims to collect information from expert panelists in a structured process and shape this information [14]. The Delphi technique is a method that allows experts in a specific field to make final decisions systematically and without bias, without influencing each other, while maintaining confidentiality and anonymity during a specific process. [15]

In the first round of the Delphi study, a SWOT analysis was conducted to identify the challenges and opportunities that organizations' human resources might encounter in the workplace with the emergence of new technologies, particularly virtual reality solutions and metaverse universes. Four main questions were addressed in the SWOT analysis to determine the challenges and opportunities of using metaverse in the workplace:

- Strengths: What are the key strengths of metaverse in the workplace?
- Weaknesses: What are the key weaknesses of metaverse in the workplace?
- Opportunities: In what ways can organizations/individuals benefit from metaverse in the workplace?

- Threats: What potential threats does metaverse pose for organizations/individuals in the workplace?

After the panelists were identified, in the first Delphi survey, they were given information about the purpose and scope of the study by one-on-one interviews and then the panelists were asked to provide open-ended responses to the four questions in the SWOT analysis.

In the second Delphi survey, the findings from the first survey were analyzed and prioritized. The participants were then asked to complete a newly created and structured five-point Likert-type measurement tool and to provide comments and explanations regarding their level of agreement with the relevant items. [16] In the third Delphi stage, the analysis of the previous outputs was conducted and the same survey as in the second stage was sent with the addition of first quartile (Q1), third quartile (Q3), median (Md), and range (R) values. The R value was obtained by subtracting the Q1 value from the Q3 value. With the answers provided by the panelists and this information, it was determined whether there were any changes or not, and the final stage was completed [17].

It is expected that the experts in the study have the knowledge and competence to contribute to the researched topic [18]. The experts involved in the research were selected by the snowball/ sampling method, one of the purposeful sampling methods. The selection of the experts to be included in the study in the snowball sample started by taking the suggestions of the Artificial Intelligence NGO management and advisory board members. The minimum number of panelists in the Delphi method is 7, and the ideal number is expected to be between 10 and 20 [16]. In the context of this study, considering the scope of the research, 15 expert panelists were selected, however, due to the intensity of their work, the study was completed with 11 expert panelists. Another important issue after determining the number of participants to apply the Delphi method was to identify the expertise and criteria of the participants. The expertise criteria sought in the participants who participated in the study were as follows:

- Having participated in virtual reality, augmented reality, or mixed reality projects.
- Being an entrepreneur or manager in the technology ecosystem.

At least one of these criteria was sought, but limited access to experts in this emerging field of Metaverse posed a constraint on this study.

The demographic data of the technology ecosystem professionals who participated in the SWOT analysis and Delphi survey evaluating the impact of the metaverse on business life are presented in Table 1.

However, panelists work in institutions operating in Istanbul, Ankara, and Kayseri. There are 4 white-collar workers and 7 entrepreneurs among the participants. Information was gathered through one-on-one interviews with individuals during the first round of Delphi, which was the SWOT analysis.

Triangulation method is used as a qualitative research strategy that tests validity by combining information from different sources. In the study, the Researcher / Investigator Triangulation method was applied while creating the questions directed to the experts and to ensure the reliability of the answers received.

TABLE I. DEMOGRAPHIC DATA OF PANELISTS

| Panelist No | Age | Education Level | Occupation | Institution | Job Position |
|---|---|---|---|---|---|
| 1 | 40 | Master's degree | Economist - Financial Technologies Specialist | Bank | Manager |
| 2 | 45 | Master's degree | Computer Engineer | IT Firm | Chairman of the Board |
| 3 | 34 | Master's degree | Project Manager | IT Firm | Project Manager |
| 4 | 37 | Bachelor's degree | Computer Engineer | IT Firm | Founding Chairman |
| 5 | 33 | Master's degree | Civil Engineer | NFT Game Firm | Co-Founder |
| 6 | 40 | Bachelor's degree | Academician | Digital Monitoring and IT | Founding Chairman |
| 7 | 33 | Bachelor's degree | Civil Engineer | NFT Game Firm | Co-Founder |
| 8 | 42 | Bachelor's degree | Statistician | Research Firm | Founding Chairman |
| 9 | 45 | Doctorate | Data Analyst and Solution Specialist | TOBB | Founder/General Manager |
| 10 | 33 | Master's degree | Economics - IT Manager | IT Firm | Sales Manager |
| 11 | 34 | Doctorate | Academician / Entrepreneur | Public/IT Firm | Founding Chairman |

### *A. Delphi Round 1*

Upon evaluation of the interviews conducted with the panelists in the initial round of the Delphi method, the following key themes and strengths emerged:

**Strengths**

1. Quick and effective customer reach for individuals and businesses
2. Easy accessibility
3. Limitlessness
4. Enhanced communication
5. Triggering the new economy and technology
6. Efficient use of time
7. Elimination of time and space constraints
8. Accelaration of processes
9. Time-saving
10. Connecting the world together
11. Increased collaboration

**Weaknesses**

1. Lack of trust due to malicious individuals
2. Not everyone can adapt to digital maturity level.
3. Vulnerability in security

4. Laziness
5. Reduced physical interaction
6. Diminished sense of belonging due to remote work
7. Elimination of regional competitive advantage
8. Absence of legal and commercial regulations
9. Performance loss due to remote work
10. High costs
11. Absence of real emotions, conscience, and feelings
12. Failure to establish ethical codes

**Opportunities**

1. New channel for sales and marketing
2. Effective human resources management
3. Reaching more participants with lower costs through online fairs
4. Opportunity to catch up with technology and gain a competitive edge quickly
5. Opportunity to do business on a global scale without time and location constraints
6. Providing strong communication opportunities
7. Opportunity to effectively handle any type of work from any location
8. Creating new business opportunities
9. Decrease in general expenses
10. Opportunity to pursue dreams and aspirations
11. Emergence of new business opportunities with stakeholder ecosystem
12. Formation of new business models with company mergers

**Threats**

1. Reputation loss due to cyber security vulnerabilities
2. Increased ease of theft, fraud, and exploitation, especially involving children
3. Traditional businesses that cannot transform losing customers
4. Unequal competition
5. Ease of manipulating society
6. The many and varied benefits of the new ecosystem will cause confusion
7. Threats to personal data protection
8. Future loneliness caused by virtual socialization
9. Social problems arising from the gap between one's true self and desired identity
10. Increased income inequality
11. Job loss for individuals
12. Potential loss of identity for children and young people.
13. Lack of authority to appeal to in case of lost or stolen decentralized wallets
14. Significant job losses due to reduced performance in remote work
15. Unhappiness stemming from excessive work without overtime pay
16. Sociological damage
17. Significant time consumption

The characteristics identified above are the expressions obtained from the SWOT analysis conducted by experts in the first Round of Delphi.

*B. Delphi Round 2*

In the first part of the analysis conducted using the Delphi technique, the key words that emerged from the SWOT analysis were sent to the experts as a 52-question survey in the second round of the Delphi (11 questions for strengths, 12 questions for weaknesses, 12 questions for opportunities, and 17 questions for threats).

As known, the First Quartile (Q1) is the point that separates the lowest 25% of the responses on the left and the highest 75% on the right. The Third Quartile (Q3) is the point that separates the lowest 75% of the responses on the left and the highest 25% on the right. The range (R) value is the difference between the Third Quartile and the First Quartile (R=Q3-Q1) [16]. According to [19], when the R value is greater than 1.2, it is assumed that there is no consensus among experts. The questions that had a value higher than 1.2 and on which the experts did not reach a consensus were resubmitted in the third round.

When the survey results were evaluated, it was observed that there was a consensus among the experts on the strengths of the metaverse that are thought to impact the business world, and agreement was reached. The item that received the highest number of "strongly agree" responses in the business world was the Metaverse's role in triggering new economy and technology. The most striking result in this section is the consensus that the metaverse will create a brand new economy and lead to new technological developments.

However, among experts, there is no consensus regarding the weaknesses of the Metaverse that are believed to impact the business world, as 7 questions showed no agreement. The item that received the highest number of "strongly agree" responses was the notion that the Metaverse will "reduce physical interaction". This evaluation suggests an anticipation of decreased physical interaction in the new world order introduced by the Metaverse. The most significant finding in this section is the strong consensus indicating that the Metaverse will lead to a reduction in physical interaction. The key words on which the panelists could not reach a consensus are as follows:

- Lack of trust due to malicious individuals (R=1.5)
- Diminished sense of belonging due to remote work (R=1.5)

- Elimination of regional competitive advantage (R=2.0)
- Absence of legal and commercial regulations (R=1.5)
- Performance loss due to remote work (R=1.5)
- High costs (R=1.5)
- Absence of real emotions, conscience, and feelings (R=2.0)

There is no consensus among experts on three questions regarding the potential opportunities of the metaverse in working life. When the opinions are evaluated, there is a high level of agreement on the following points: the opportunity to conduct business globally without the constraints of time and location, the ability to effectively perform any kind of work from wherever they are located, and the generation of new job opportunities. These evaluations indicate that the metaverse will create many new industries and income streams. Furthermore, it becomes evident that there will be no limitations in terms of place and time when it comes to creating these opportunities. The questions on which experts could not reach a consensus are as follows:

- Reaching more participants with lower costs through online fairs (R=1.5)
- Decrease in general expenses (R=1.5)
- Opportunity to pursue dreams and aspirations (R=2.0)

There is no consensus among the experts on five questions regarding the perceived threats of the metaverse in working life. Upon evaluating the opinions, a substantial level of agreement is observed regarding the following views: unequal competition, feelings of isolation arising from virtual environments, and the risk of people losing their jobs. According to the experts' opinions, it is evident that, similar to opportunities, threats will also emerge in the world of the Metaverse.

- Reputation loss resulting from cyber security vulnerabilities (R=1.5)
- Ease of manipulating society (R=1.5)
- Potential loss of identity for children and young people (R=1.5)
- Unhappiness stemming from excessive work without overtime pay (R=2.0)
- Significant time consumption (R=1.5)

### *C. Delphi Round 3*

In the final round of Delphi analysis, there was still no consensus among the experts on six questions out of the previous 15 questions on which consensus could not be reached. These unresolved topics consist of the weaknesses and threats of the Metaverse in working life.

- Lack of trust due to malicious individuals (R=1.5)
- Diminished sense of belonging due to remote work (R=1.5)
- Performance loss due to remote work (R=1.5)
- High costs (R=1.5)
- Unhappiness stemming from excessive work without overtime pay (R=1.5)
- Significant time consumption (R=2.0)

## III. Discussion and Conclusion

The world is in a perpetual state of evolution and transformation, mirroring its history. The emergence of new technologies acts as a catalyst for this ongoing process of development. Within this context, Metaverse technology stands out as a prominent driving force that will shape the future world. The aim of this study is to unveil the impact of the Metaverse on people's working lives by utilizing a methodology rooted in expert predictions regarding the future of work within the Metaverse paradigm.

Based on the study findings, several significant aspects are believed to profoundly impact working life through the Metaverse. Based on expert predictions, the Metaverse will enable individuals and businesses to reach their customers quickly and efficiently, benefit from easy accessibility, experience boundless possibilities, strengthen communication, trigger new economy and technology, facilitate efficient time management, eliminate time and space constraints, accelerate processes, save time, connect the world together, and foster collaborations. Experts have reached a consensus on these influential aspects, which is a noteworthy outcome. The most striking result regarding these strong aspects is the consensus that the Metaverse will create a whole new economy and drive new technological advancements. These expert opinions align with existing studies in the literature, emphasizing the innovative potential of the metaverse in terms of hardware, software, and business models [10, 20, 21].

The study also identifies the weak aspects believed to impact the working life through the Metaverse. Based on the predictions put forth by the experts, the metaverse will lead to distrust due to malicious individuals, cause difficulties in adapting for everyone due to digital maturity levels, result in security vulnerabilities, promote laziness, reduce physical interaction, eliminate the sense of belonging created by remote work, diminish regional competitive advantages of companies, create problems due to the absence of legal and commercial regulations, cause performance decline due to remote work, generate high costs, result in the absence of real emotions, conscience, and feelings, and fail to establish ethical codes. The most significant result concerning the weak aspects is the prevalence of opinions stating that the metaverse will reduce physical interactions. The studies reveal that job descriptions unsuitable for working in the Metaverse vary, particularly based on individuals' digital maturity levels [10].

When assessing the opportunities, the study emphasizes that the Metaverse will serve as a novel avenue for sales and marketing, enable effective management of human resources, offer the potential to reach a larger audience through cost-effective online fairs, provide an opportunity to catch up with technology and gain a competitive advantage, remove limitations of time and space, facilitate global business operations, enable robust communication within the Metaverse, empower individuals to efficiently manage various

tasks remotely, create fresh business prospects, reduce overall expenses, allow individuals to pursue their aspirations, unlock new business opportunities through stakeholder ecosystems, and foster the emergence of innovative business models through company mergers. Furthermore, high levels of consensus exist among the experts regarding the opportunities such as the ability to conduct global business operations without time and space constraints, the effective management of tasks from any location, and the generation of new business opportunities. It is evident from the expert evaluations that the Metaverse will create numerous new job sectors and sources of income while eliminating constraints such as time and location.

The threats believed to affect the working life in the metaverse include reputational damage due to cyber security vulnerabilities, increased risks of theft, fraud, and exploitation, particularly concerning activities involving children, traditional businesses unable to adapt losing customers, unequal competition, manipulation of society, confusion arising from the diverse benefits of the new ecosystem, threats to personal data protection and privacy, feelings of loneliness resulting from virtual socialization, societal issues stemming from the discrepancy between one's true identity and desired self-presentation, increased income inequality, job losses for individuals, loss of identity for children and young people, lack of recourse in case of loss or theft of decentralized wallets, significant job losses due to performance decline in remote work, dissatisfaction among individuals who work excessively without receiving overtime pay, social disruption, and significant time consumption within the Metaverse. Additionally, there is a high level of consensus on issues such as unequal competition, feelings of loneliness due to virtual environments, and job losses for individuals. As evident from expert opinions, similar to the opportunities presented in the real world, the metaverse will also bring forth potential threats to individuals.

Some of the points that experts agree on as a threat are inconsistent with recent studies. For example, in a study of Young Metaverse users in Korea, it was concluded that emotional touch through avatars in Metaverse would enhance the sense of social presence, encourage supportive interactions, and thus improve social connections between users. Also, similar studies reported the benefits of using the virtual environment to reduce feelings of loneliness [22] [23][24].

The study concludes with six unresolved questions related to the weak aspects and threats of the Metaverse's impact on the working life. These issues are as follows: lack of trust due to malicious individuals, loss of sense of belonging due to remote work, performance decline due to remote work, possibility of high costs, unhappiness stemming from excessive work without overtime pay, and significant time consumption. The presence of unresolved issues reflects a significant divergence of opinions among experts. While some experts fully agree with these points, others hold contrasting viewpoints.

When analyzing these specific concerns, the lack of trust resulting from malicious individuals emerges as a current challenge during the early stages of the Metaverse, primarily due to the incomplete implementation of certain security measures.

The view that remote work may lead to a decline in performance is another unresolved issue. However, some businesses, particularly during the pandemic, have demonstrated that workers' productivity has increased. The productivity increase observed in these studies encompasses the period of the pandemic and subsequent years. Although average productivity when working from home remains lower than in-office work, it shows a gradual incremental improvement over time. This phenomenon is attributed to employees' growing familiarity with digital platforms [25][26]. Consequently, this circumstance has led to a lack of consensus among experts regarding the extent to which metaverse business models will impact productivity. The Metaverse incurs certain investment costs due to being a new technology, but it also eliminates the physical cost of gathering people from different parts of the world in one place. Climate change presents another scenario where physical gatherings come at a cost. Recent research indicates that wider adoption of the metaverse could potentially contribute to a reduction of up to 0.02 °C in global surface temperature by the end of this century and lead to a decrease of up to 10 Gt of CO2 in greenhouse gas emissions [27]. Since it can increase costs in some areas while reducing them in others, there is no consensus among the experts regarding this view.

In remote work systems, the concept of working hours can be more flexible. People typically perform their tasks within specific time intervals at their workplaces and resume their work from where they left off on the next workday. However, in remote work systems, especially for individuals who do not change their working environment at home, the notion of working hours can sometimes change. Dissatisfaction arises when individuals who work longer and at different hours compared to their traditional office hours do not receive overtime pay. There is a divergence of views from the employer's perspective. People experience some discomfort in adapting to the new system. This topic is also an unresolved issue among experts.

The unresolved viewpoint on "significant time consumption" hinges on the nature of the activities or work individuals undertake in the Metaverse, determining whether they are productive or unproductive. If individuals utilize their time in the Metaverse for skill development, work-related tasks, or creative endeavours, it may not be perceived as wasteful. Generally, people tend to worry about the unknown. The present world provides people with ample opportunities to access information, enabling them to gain new skills. People, just as they have done in the past, adapt to challenges, problems, and changes that arise with the passing of time. New professions and sectors emerge. Especially with the accelerated growth of the creative economy, particularly after the pandemic, individuals can be both employees and entrepreneurs. For instance, the concept of gaming has gained more recognition with the Metaverse. While gaming used to be associated with activities that people, especially children, engaged in when they were bored, it has now transformed into a trillion-dollar industry. Businesses have started incorporating gamification into their marketing, production, and advertising activities.

Based on extensive discussions with experts, the findings strongly suggest a widespread belief in the Metaverse's potential to generate new economic and job opportunities. Just as previous technological advancements have rendered certain jobs obsolete, the advent of "Metaverse technology" is expected to have a similar effect. However, it is anticipated that this technology will also give rise to a multitude of new fields and employment opportunities. In this context, the study examines the relationship between the Metaverse and working life from various perspectives.

When evaluating the unresolved issues in the final round, differences in perspectives become apparent. While there is currently a lack of sufficient research in the field, it is important to note that the topics of Metaverse governance, ethics, safety and security, acceptable behaviors, and privacy are essential areas that warrant exploration in future studies [28]. This study aimed to identify and prioritize agreed-upon topic headings related to the impact of the Metaverse on working life using the Delphi method. These topics were then opened up for further discussion within the framework of working life. Future studies could expand the scope of participants involved in the Delphi analysis by including professionals in decision-making or stakeholder positions from the public sector, civil society organizations, and the private sector, thus diversifying the findings. Furthermore, it is recommended to apply the Delphi method to explore more specific topics such as "future new professions with Metaverse technologies".

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## CONFLICT OF INTEREST

The authors certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.

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