CHILDRENS' PRIVACY AND VULNERABILITY ISSUES ENCAPSULATED IN THE CONTENTS OF METAVERSE: AN EXPLORATORY STUDY

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ABSTRACT

The metaverse is a collection of every virtual world built using block chain technology. Metaverse can be a gaming planet or NFT's or gaming galleries, curated lands, or digital streets. It is the aggregate of the new digital spaces that people are calling in the next generation of the internet. The present study attempts to investigate the vulnerabilities and privacy concerns of children encapsulated in the Metaverse. The researchers applied in-depth interview technique to get acquainted with multiple aspects related to the complexities involved in metaverse. As it is a pioneering study of futuristic technology, there are least studies available on the topic. Therefore, researchers took insights of two technical experts that greatly enriched the present study to conduct qualitative content analysis. Further, after applying qualitative content analysis tools to analyse the texts, images, visuals, and oral materials, the researchers found that due to being a futuristic study, there remains certain limitations and the amount of data seems to be comparatively low. There seems to be privacy and security issues surrounding the virtual world of Metaverse. The study found that children are the ones who are supposed to be most affected sufferers of metaverse and if no precautions, security measures, or any other safety measures are applied it would be a threat to the children.

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Introduction

The Concept of Metaverse

The concept of Metaverse is not new. It was first described in the 1992 novel *Snow Crash*. Several companies later developed online communities based on the concept, most notably 'Second life', released in 2003. In the Metaverse, people use avatars to represent themselves, communicate with each other, and virtually build out the community. In the Metaverse, digital currency is used to buy clothes or weapons and shielding in the case of video games and many other items. Users can also virtually travel through the Metaverse just for the sake of making fun with the help of virtual reality headsets and controllers. *Snow Crash* was more of a dystopian view of the future and didn't put the Metaverse in a positive light. Author Neal Stephenson coined the term Metaverse as a kind of next-generation virtual reality-based internet. One way to achieve status in Stephenson's Metaverse was technical skill, which was represented by the sophistication of a user's avatar.

Ready player one by Ernest Cline was another novel that helped popularize the idea of the Metaverse. It was later made into a movie directed by Steven Spielberg. The 2011 dystopian sci-fi novel is set in the year 2045, where people escape the problems plaguing Earth in a virtual world called The Oasis. Users access the world using a virtual reality visor and haptic gloves that let them grab and touch objects in the digital environment. In the Metaverse, users traverse a virtual world that mimics aspects of the physical world using technologies such as virtual reality (VR), augmented reality (AR), Artificial Intelligence (AI), social media, and digital currency.

The Metaverse refers to both current and future integrated digital platforms focused on virtual and augmented reality. It is widely hyped as the internet's next frontier and seen as a significant business and financial opportunity for the tech industry and other sectors. In the vision for the Metaverse articulated by social media and technology companies, devices like virtual reality headsets, digital glasses, smart phones, and other devices will allow users access to 3-D virtual or augmented reality environments where they can work, connect with friends, conduct business, visit remote locations, and access educational opportunities, all in an environment mediated

by technology in a new and immersive way (Anderson and Rainie, 2021).

Salient Features of Metaverse

The internet and smart phones have played a groundbreaking role in transforming theconventional perception of digital technologies. As the talks on Metaverse start gaining momentum, many experts have touted the Metaverse as the next internet. The notable features you can find in Metaverse include:

Infrastructure

In the case of Metaverse, the infrastructure primarily refers to the technology infrastructure backing up the Metaverse. The infrastructure includes connectivity technologies such as Wi-Fi, cloud computing, and 5G, alongside employing high-tech materials such as GPU, etc.

One of the staple highlights of the Metaverse is that it would continue expanding. Therefore, the infrastructure for the Metaverse must offer assurance for ultra-low latency, unbelievably fast speeds, and improved capacity. A strong infrastructure provides the foundation for seamless, value-based experiences for all users in the Metaverse.

Human Interface Technologies

Speaking of infrastructure as one of the key Metaverse traits, one would turn toward human interface technologies. Users can make the most of technologies such as VR headsets, haptics, VR glasses, and many other technologies for joining the Metaverse.

The human interface technologies help in transporting users into the infinite immersive spaces of the Metaverse. However, improvements in human interface technologies for the Metaverse are underway. Smart phones, laptops, tablets, and PCs can also serve as access points to the Metaverse when complemented with the right features.

Digital Avatars

Another prominent highlight among the significant traits of Metaverse refers to digital avatars. Digital avatars are one of the focal elements in the Metaverse design. Users can create digital avatars

for expressing their emotions and feelings in the Metaverse in an unconventional manner. You can use the Metaverse features for creating digital avatars with personalization, thereby allowing you to take a digital replica of your favorite superhero.

Interestingly, the feature of creating and customizing digital avatars in the Metaverse also opens up new prospects for gamification. As a result, digital avatars strengthen the basis for an interactive and immersive experience in the Metaverse.

Decentralization

The vision of the Metaverse paints it as an open, shared world where users can move seamlessly across platforms. Metaverse users could create their own virtual experiences and assets with economic value and trade them seamlessly without centralized authorities. This is where you would find decentralization a notable feature of the Metaverse. Block chain edge computing, and artificial intelligence are some of the biggest technologies supporting democratization of the Metaverse. With the help of decentralization, users can gain complete control and ownership over their assets and experiences in the Metaverse. As a result, the decentralization trait of the Metaverse plays a crucial role in determining the freedom of users.

Experiences

The Metaverse is practically just an open and empty virtual environment without experiences. The most profound highlight among key features of Metaverse, i.e., the experiences is that it helps in transferring many physical experiences under a virtual roof. Most important of all, the Metaverse promises to bring all physical and digital experiences under one roof.

Security

There is no reason you can avoid security features in the Metaverse. Cyber security has been one of the notable challenges for multiple companies worldwide. Therefore, the concerns of security also present detrimental issues for the Metaverse. To address such concerns, the Metaverse offers security features in the form of ethical and privacy standards in the ecosystem. While the Metaverse is still under development, the emphasis on security as one of the key Metaverse traits cannot be overstated. The Metaverse needs better standards of user protection and user identities.

Persistence

One of the common perceptions about the Metaverse is that it is a VR world. You have to put on your VR headsets, and you can access the virtual world of the Metaverse. However, what happens when you take off the headset? Does the world in the Metaverse stop there? No. The Metaverse continues running even when you are plugged out. Think of it as playing an online multiplayer game where the other players continue playing the game, even if you are not there.

VR experiences are limited to the specific company or the brand offering the experience. On the contrary, the Metaverse is an infinite open world that never rests, just like the real world. Therefore, persistence stands out as one of the prominent highlights of the Metaverse, making it available at all times.

Influence of Metaverse on Children

The development of technology affects all spheres of human life, including children. The change resulting from the fast development of technologies and the new media has a huge dent in the life children. The question is how the development of technology and the new media influence the changes in the context of children. Internet is an increasing part of today's culture, especially for children and youth, for whom schoolwork, online gaming, and social networking are among the most popular activities. However, lack of common agreement about the right approach to educating and protecting children adds further challenges to a child's online experience and expressions. Additionally, cultural and geographical differences in legal and social norms reflect the fact that there is no universally accepted view of what defines a person as a child, or of what are appropriate for children, and what are not. Parents cannot assume that their children will be protected by the supervision or regulation provided by online services. Most chat rooms and social media sites are completely unsupervised. Encompassing will not know if they are talking with another child or a child predator pretending to be a child or teen.

Theoretical Framework

The paper is intended to approach data as the production of several social behaviours in the virtual platform. The study problematizes the psychological dangers, risks, and violations in the metaverse.

The researchers employ multiple theories from cultural and media studies. The technological foundations in the study were identified by Thorstein Veblen's technological determinism. Adaptive structuration theory which focuses on social structures, rules, and resources provided by the technologies and institutions are considered to be the basis of human activities.

The uses and gratification theory is also applicable, that the individual users will continue to be engaged with the social networking sites whether their needs are fulfilled by each tool. Media has the most influencing ability in perpetuating tendencies and beliefs in a social system. The media is often meant for changing the social relatives but also for propagating the problems and the socio-political environment.

Technological determinism is a reductionist theory that aims to provide the causative link between technology and societal nature. The theory tries to explain as to what or who would have the controlling power of humans. The theory questions the degree to which the human thoughts or actions Langdon Winner provided for the hypothesis of this theory. The technology of a given society is the fundamental influencer of the various ways in which society exists. And he added that the changes in society are the primary and the most important source that leads to the change in society.

Adaptive structuration theory involves both the structure of the technology and the social interactions while using the technology. To look at how technology can and should support teams one could utilize adaptive structuration theory. It not only views the technology and how it is used in organizational and term settings, but it also looks at how the technologies are used and interpreted by the end users, so as in the research paper. The new technologies are often introduced with no consideration of their utility to the agents expected to use these technologies, causing incompatibilities and productivity losses. The properties of the theory enable human agents when implementing new technologies and organizational change initiatives.

The gratification of needs is the most important role of the media for humans. The uses and gratification theory of communication explains how people use media to fulfill their needs. People get knowledge, interaction, relaxation, awareness, escape, and entertainment. The theory focuses on the needs and motives and gratification of the media users.

Operational Definition of Keywords

Metaverse: The collection of all block chain-based virtual worlds is known as the Metaverse. They might be virtual streets, NFT galleries, or gaming worlds.

The key things to keep in mind whenever you consider the Metaverse is that it is not a physical location. People refer to the next version of the internet as the combination of the new digital spaces.

Media companies, music publishers, sportswear brands, and crypto currency analytics platforms all have a presence in the Metaverse. So too do rock stars, rappers, Care Bears, and Smurfs. So it's a broad church and there's room for everyone.

Literature Review

An article entitled "*The Metaverse of Harassment and Hate*" by Dharithri Ganguli andSaptaparna Biswas (2022) describes the rape culture in the metaverse. It mentions the many gang rape incidents and harassment instances faced by female avatars in the metaverse. Aggressive groping, sexual and verbal harassment, etc. are the horrifying experiences of women users in the Metaverse at public events. And they also reported the truth that the avatars may be virtual, but the abuse feels real. The article includes the statements and personal experiences of the victims and other female avatars on the platform.

A 21-year-old unnamed researcher who works for the non-profit advocacy organization Sum Of Us reported that her Metaverse avatar was sexually assaulted in a virtual room on the Metaverse platform. "The researcher was led into a private room at a party where she was raped by a user who kept telling her to turn around so he could do it from behind while users outside the window could see all while another user in the room watched and passed around a vodka bottle, and gang- raped her," states the report titled *"Metaverse: another cesspool of toxic content."* (2022). It also includes information on virtual groping, gang rape, and the ease with which children can use the platform and be harmed.

The Metaverse app gives children access to a virtual strip club (2022). This is an article by Angles Crawford and Tony Smith. A BBC news investigation has found that the Metaverse exposes children to entirely inappropriate and incredibly harmful sexual content. The Metaverse, the infamous 3D virtual network dubbed as the future of the internet, is a platform where people can exist and interact in brand-new worlds by simply fashioning a headset. It even has a

duplicate of the Kaaba and features embassies, and users can explore the virtual world with 3D avatars. However, as it turns out, the virtual network is also a platform for sexual content. Children will continue to face these dangers until Meta and apps like VR Chat eventually take the necessary measures. The BBC also noted that many Metaverse apps allow users to display the visuals from a VR headset on other devices like phones and laptops, which makes it possible for parents to supervise their children's activities as they explore the Metaverse.

"*Metaverse virtual worlds lack adequate safety precautions, critics say*" (2022),published on NBC news by Maura Barrett and Douglas Forte. The critical report emphasized the experts' concerns about safety in the Metaverse and the prevalence of sexual harassment. The report shared the actual number of assaults that happened on the platform for the time being. It includes 37 instances of sexual content, 20 reports of racism, and 9 reports of abuse, which is mostly against minors. Instances of hate speech, homophobia, and rape culture were reported in this virtual world. Also, Metaverse is trying to get some safety tools, but to a great extent, they are not applicable at all.

The article *how the metaverse could affect the lives of kids* (2022) by Marcel Deer is an article that deals with the Metaverse, which poses potential risks for children through cyberbullying and a lack of privacy. They describe cyber bullying as a serious concern because children can be targeted and harassed by anonymous users. And the risk of children being exposed to inappropriate content such as violence, sexual content, and hate speech is high. And the experts were not optimistic about how the Metaverse would affect children, as it is addictive for kids. Other than the physiological risks, there are physical risks of the Metaverse, which are also something to consider. Metaverse would affect children, as it is addictive for kids. Other than the physiological risks, there are physical risks of the Metaverse, which are also something to consider.

Anshal Bhagi's "*Metaverse for Children: Preparing Children for a Creators' Economy and a Mixed Reality Future* (2022)" is an article in the Times of India daily. In this article, they look at what the Metaverse is, why it matters, the role that kids can play in the building of this future, and the positive impact of early Metaverse exposure on their lives The article follows the technical merits and the future of unlimited possibility in the Metaverse. The article carries the topic of early exposureto the meta, enabling children to be creators rather than in the inevitable Metaverse future. This opens the children to the colorful and creative world of the Metaverse. The article completely portrays the future of the Metaverse or else the future itself as the Metaverse.

An article on the hot topic Metaverse entitled "*What are the kids doing in themetaverse?"* was written by Nelson Reed (2022). According to the article, they have covered the data on the Metaverse, of the commonsense census: media use by tweens and teens. They discuss how the Metaverse and VR threaten the physical well-being of children and the privacy implications of these increasingly connected, largely unregulated digital worlds. And they also investigate the misinformation and manipulations that enter the Metaverse. The inventions from the report include children would face psychological dangers (ie) navigating the Metaverse through VR would make nausea, eyestrain, and other forms of cyber sickness. There are also privacy violations because children's sensitive biometric information could be exploited for commercial gain, which could lead to involuntary physical relations to track and target their internal desires. The report also lays out two areas of potential harm that need further exploration. They are sexual content abuse and physiological risks.

Claire Tragesser's *What the Metaverse Might Mean for Kids?* (2022) deals with the cons of the Metaverse, especially in the case of children. According to the article, the Metaverse now appears to be everywhere, conjuring up images of a distant future in which people spend all of their working hours glued to their virtual headsets and simply living in a virtual space. In his futuristic interpretations, they are also included in the same, as in the future Metaverse we won't use phones or computers. And we will interact while wearing virtual reality headsets, using our bodies as a part of the play and experiencing the much more real online space. And the article also deals with the worries about the privacy of the children, that kids spending too much time in a virtual environment could even form memories based on virtual experiences. Children could form unrealistic expectations of what reality says about their bodies or what their houses should look like, and also lose real- world social skills. For instance, experiencing virtual worlds as avatars could amplify the cyber bullying that already happens.

Methodology

The present work titled 'Childrens' privacy and vulnerability issues encapsulated in the contents of Metaverse: An exploratory study' is an exploratory study that seeks to throw light on the perils lying in the Metaverse and the possibilities for sexual harassment and racist insults likely to arise for children and other vulnerable groups shortly when Metaverse will become an inalienable part of our society. These

concerns prompted the researcher to delve into an issue that is still in the making so that authorities and society at large can be wary of these repercussions shortly, even as we continue to be enamored of this new technology.

In this pioneering study, the researchers found several daunting challenges as there is paucity of data on the one hand, and the concepts and social implications are still fluid, evolving, and just firming up even as we try to analyze them. Previous studies are scarce. Against this backdrop, the researchers have depended on qualitative methods for this study because only these methods happen to be feasible in the the present context.

The study uses qualitative content analysis, which is widely used for the analysis of qualitative and quantitative data. Research methodologies are categorized into qualitative and quantitative. A qualitative content analysis proceeds with the systematic examination of categories of textual, visual, and oral materials in a theoretical way. The research method is often used in humanitarian subjects, but it has been systemically used in media studies as well. The methodology can be applied to the validation of texts and various formats of plot, pictures, characters, audio, video, and other multimedia communication. This research requires qualitative analysis because deals with social behaviour.

The analysis of the Metaverse on the vulnerabilities of children and their privacy issues, the paper encompasses a topic-oriented analysis of the same. The analysis proceeds under two categories. To systematically develop the findings, the researchers have gone through an in-depth interview with two eminent technological experts and also qualitative content analysis of news stories on the topic and the related topics. As it is a pioneering study, one of the early ones in the study can shed light on an emerging area at the cutting edge of communication and technology. Time-traveling, science fiction (sci-fi) has always enamored mankind. The Metaverse, perhaps, is one of the biggest inventions around the corner and deserves the attention of social scientists to understand how it interacts with our society at multiple layers. As this is a new study,   technology is not freely available at present in India, and it is not possible to use the conventional methods of analysis. Hence, the researchers have studied in detail the various anecdotes and media clippings, and news stories related to the social effects of the Metaverse, which is focusing on children. Anxiety about the future and social commitment are at the heart of the present study.

In-Depth Interview

As it is a pioneering study of futuristic technology, there are not many studies about the topic so the insights of two technical experts would greatly enrich my present study. And I can gain in-depth knowledge about the implications for children in the Metaverse, particularly issues of sexual exploitation and harassment. The researcher conducted in-depth interviews with two technical experts namely Devadas Rajaram and Varun Ramesh.

Devadas Rajaram is a professor of multimedia and data storytelling, mobile journalism, social media, reporting, and editing with over 15 years of editorial experience in English language newspapers, and digital and mobile platforms. He was named one of the top twenty innovators in journalism education worldwide bythe Media Shift in 2018.

Varun Ramesh is a digital media product designer and former chief sub-editor at Asianet news. He was skilled in newsroom innovations through cutting-edge digital technologies. He had an experience of 18 years in the arena of journalism and 11 years in digital media.

Objectives

- To understand metaverse as a potential threat for the physical well-being of a children
- To examine the privacy concerns encapsulated in metaverse
- To understand the chances of children to become victims of cyber bullying
- To realise the possible psychological problems faced by children in metaverse
- To evaluate the protective mechanisms designed to safeguard children in metaverse

Scope of the Study

Metaverse is now a hot topic in the world. The tech giants like Nike and Tinder, and everyone else, are placing their bricks for the future where interactions on online platforms take place primarily in virtual environments. The Metaverse has enormous potential, but with this new world, new ideas, and new experiences come risks such as cyber bullying, privacy invasion, safety, and much more. Many people are saying that the Metaverse is capable of blurring the line between reality and virtual reality.

Just like in pop culture, the idea of multiple parallel universes has been trending lately. The idea of a separate digital reality, similar but different from the real world, in a nutshell, the Metaverse is simply a digitally generated universe in which we can interact with our surroundings. But since Metaverse's actual idea is to improve contact, it would affect the security of the children. The Metaverse poses potential risks for children, such as cyber bullying and lack of privacy. Cyber bullying is a serious concern, as kids can be threatened and harassed by anonymous users. In addition to inappropriate content such as violence, sexual content, and hate speech. So a study among these will help to understand the predatory behavior of the Metaverse and the vulnerabilities of the children, to make it more comfortable for the children as well. The fact that the Metaverse is a futuristic concept, which means it can be used primarily for future generations, is one of its main areas of applications.

Limitations of the Study

The current study is based on the Metaverse as the virtual strip club and the vulnerabilities of the children. Some of the limitations the researchers experienced during the study are related to the availability of the data. The Metaverse is the futureof the computer-generated world. As it is the future, the availability of the data is limited. The main limitation is that we cannot directly interact with any primary or secondary character in the Metaverse. It is hard to analyze the Metaverse at this juncture because it is not extensively used by people, and it is not well established in India.

The biggest constraint of the study is that it is a futuristic study and we cannot deal with the topic in full. Researching children's vulnerabilities is also quite difficult as the child subjects are mostly very sensitive.

Findings and Discussion

Qualitative Content Analysis

The analysis of the texts and oral submissions made by the experts is as follows:

Concerns for Privacy and Security

Privacy concerns and security issues in the Metaverse are debatable fields. In the beginning, when we began to use social media networks

like Facebook, Instagram, and other online platforms, we had more cases of cyber bullying and sexual harassment. The Metaverse will be more openly proclaiming the same thing. There's a risk to privacy in every digital interface. Your privacy is compromised from the moment you own a smart phone or go online. That doesn't mean that we should resist innovation. It's for the governments and platforms to agree on common regulations and guidelines to protect privacy. The Dubai government has already come up with laws and guidelines to regulate the Metaverse. Cyber laws will be enacted to address privacy and security concerns.

Portrayal of Sadism, Metaverse, and the Children

"Sadism portrayed in the Metaverse" is a sweeping allegation without specific evidence. Digital is not evil or good as such. Digital is what we make of it. Digital can be used for whatever purpose we humans set out to use it for. Like most things humans create, it is a tool. How it functions and the role it plays in society is determined by the end-user. Knives were not invented to kill people. It was invented to make life easier for us when chopping vegetables or meat. But, if someone uses a knife to kill someone, you cannot blame the knife for it.

There is a cross-section existing in the online world where there are good and bad existing in the same society to which belong evil behaviours also. And this crowd, or society itself, is migrating to the Metaverse. So that, as in society the chance for harassment and other cyber bullying will also exist in the Metaverse. As it is an evolving technology the platform should be more defined and purified as time goes by. Every new invention in society is not accepted quickly. Gradually they will be used to it. There is always confusion existing in the adoption of new technologies in society.

Cyber bullying in Metaverse

Surely, there will be greater cyber bullying in the Metaverse compared to other online platforms. However, technological barriers can be used to limit the same. Cyber bullying is discouraged on Facebook and other online platforms via campaigns and other IT measures. We are dealing with avatars here, just like in real life. The technology has to be revised to keep away the avatars that are not comfortable with the other avatars. To be sure about security issues like the 'Horizon', these types of digital barriers are ready to be introduced in the Metaverse right now.

Metaverse: Promoting Sexual Contents

Pornography and sexual display are two of the most popular topics on online platforms. Like any other porn site, people will try to promote all sorts of content in the Metaverse. The potential for real-life experience in the Metaverse will make it more appealing. As technologies evolve, sex, pornography, and relationships will evolve with them. There has been a call for Meta and other tech companies involved in the development of Metaverse applications to figure out how to deal with sexual assault on their platforms. Certain forms of moderation and systems to limit abuse are unquestionably required, but technological solutions alone are insufficient and, at times, problematic. It is for the governments and other regulators to come up with regulations to prevent such abuse.

BBC News on Predatory Behaviour of Metaverse

BBC News also spoke to a safety campaigner who has spent months investigating VR Chat and who now posts his videos on YouTube. He has spoken to children who say they were groomed on the platform and forced to take part in virtual sex. He chooses to remain anonymous because he is concerned about the safety of his family. The safety campaigner explained that because VR is so immersive, children have to act out sexual movements. Not only the BBC, but the media like the Guardian, New York Times, and the Indian media also report the same as the BBC. It acts as a legal precursor and security will be issued for the same. Time will bring about an evolution in the Metaverse platform as well.

Conclusion

The worries on the predatory behaviour of the Metaverse lead the researchers to investigate on the vulnerabilities and the privacy issues related to children. It is one among the developing problems that the authorities are enamored by the new technology and we should be cautious of the consequences in connection with metaverse.

More and more platforms are offering a wide range of tools to counteract harassment and abuse. For instance, VR Chat offers options for barring abusive people and a way to report them, which could lead to the user's account being terminated. Parents should consider safety features before purchasing VR headsets for their kids.

As per the experts interviewed by the researchers, Metaverse raises a grave concern when children are mingled with adult strangers in

a largely self-moderated virtual world; the company is inadvertently creating a hunting ground for sexual predators. After locating a victim, a predator will attempt to isolate the child, earn their trust, and persuade or pay them to share nude photos or films of themselves or even meet up. These all will badly affect the children psychologically, emotionally, mentally, and physically. To avoid these more precautions and safety measures are required to be adopted by parents and authorities alike.

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