

Key security challenges for women in Metaverse and solutions to overcome those challenges

Amey Ajgar

Student, Class 9th, S. B. Patil Public School, Pune, Maharashtra, India,
ajgaramey1508@gmail.com

Yogita Ajgar

Assistant Professor, Electronics and Telecommunication, Modern Education Society's college of engineering, Pune, Maharashtra, India
yogita.ajgar@mescoepune.org

Priyanka Bagul

Assistant Professor, Electronics and Telecommunication, Modern Education Society's college of engineering, Pune, Maharashtra, India
priyanka.awasare@mescoepune.org

Article history:	Abstract:
Received Accepted: Published:	Metaverse is the future of the internet. The upcoming decades will be ruled by Metaverse and before this technology becomes a necessity for us, it's equally important to make it safe for all sections of society including women. In the world of social media where women become an easy target of cyber bullying, digital frauds and many other digital issues, we can't deny the fact that Metaverse is 100 times more immersive and this increases the threat of cyber security more for women. In web 3.0 women have faced critical security issues and it's necessary to improve Metaverse and make it a safer technology for women.
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1. INTRODUCTION-

The idea of metaverse was coined by Neal Stephenson in his 1992 novel "Snow Crash" from then the idea of a futuristic digital world that runs parallel to the world in which we live has fascinated many researchers and scientists. Metaverse is the combination of the prefix "meta" (imply-ing transcending) with the word "universe", describes a hypothetical synthetic environment linked to the physical world After around 3 decades it looks like the idea of the digital world is coming true. Let us see this technology from a security point of view. Cyber security has always been a big issue for humanity. And when it comes to cybercrimes women are the most vulnerable to it. Metaverse being a relatively new technology it's important to impose proper rules and regulate this fully immersive 3D Space to safeguard any future hazards from it.in Metaverse every user gets an Avatar which is a digital twin of the user.

1.1characteristics of the Metaverse :

- Metaverse is a combination of different technologies such as augmented reality,blockchain and digital twin.
- AR is one of the main technologies involved in development of metaverse and is one of the gateways to get into the metaverse.
- Technologies like blockchain are decentralised in nature and work corresponding to Metaverse and help in making the Metaverse economic system.
- Digital twin is a term used for real time counterpart of a physical object, human being or process

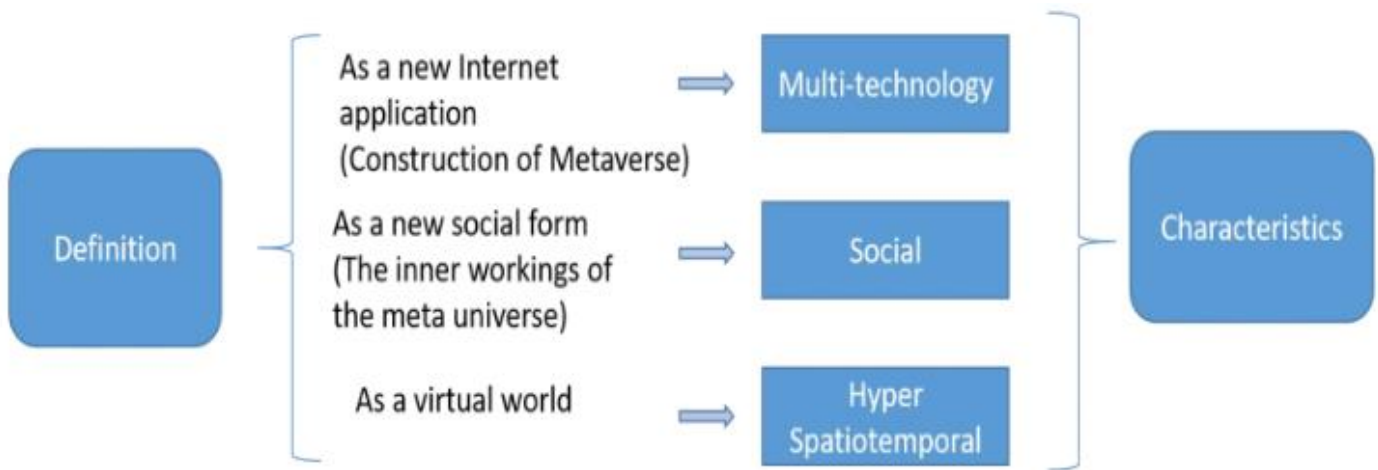


Fig. 1

2. Potential Threats of Metaverse

2.1 Privacy: Metaverse is a fully immersive technology that takes users into a 360 degree virtual environment. Unlike conventional social media in metaverse metaverse will have a large number of ways to track users in a much more intimate manner. According to the data protection report 2022 it is estimated that a large amount of data may be collected and stored in servers by metaverse companies to provide users a better user experience which also increases the threat of cyber stalking on women. Companies can use this Data for targeted advertising campaigns and these data if leaked can lead to serious crimes against women. The metaverse wants to harvest new, uncharted personal information, even to the point of noting and analysing where your eyes go on a screen and how long you gaze at certain products.

2.2 Authentication in the metaverse: According to reports around 12% of total social media handles present on the internet are fake accounts and also the problem of bot generated text is a big issue as both of them threaten the security of a womens private data. In future it is also possible that machine generated bots get into metaverse and their physical twin does not exist. This will become an ideal way to do frauds in the metaverse. Machine generated avatars in metaverse can be used for many kinds of unethical cyber practices including trolling, cyber violence and cyber bullying of women. According to statistica in 2019, 16% of facebook accounts were fake accounts, 9.5% of instagrams accounts are also fake accounts. Globally 90-95% of fake accounts are created using a woman's name and photos. These stats clearly show how vulnerable women are when it comes to authenticity in social media. We can't deny the fact that these kinds of illegal things can also happen and are happening in the metaverse.

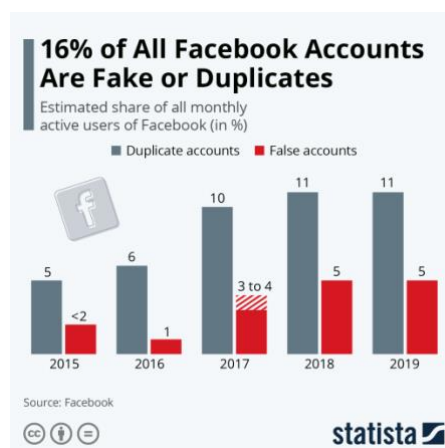


Fig. 2

2.3 Sexual harassment and abuse in Metaverse: Women have been the most vulnerable for physical and verbal abuse from decades in real as well as virtual world .In virtual world ,initially women were abused verbally but Metaverse adds a possibility of virtual sexual abuse with avatars .Many cases have been reported since last few years where digital avatars of women have been sexually harrassed by group of male avatars .This is an increasing threat of Metaverse .These types of digital abuse put negative impact on mental health of women .

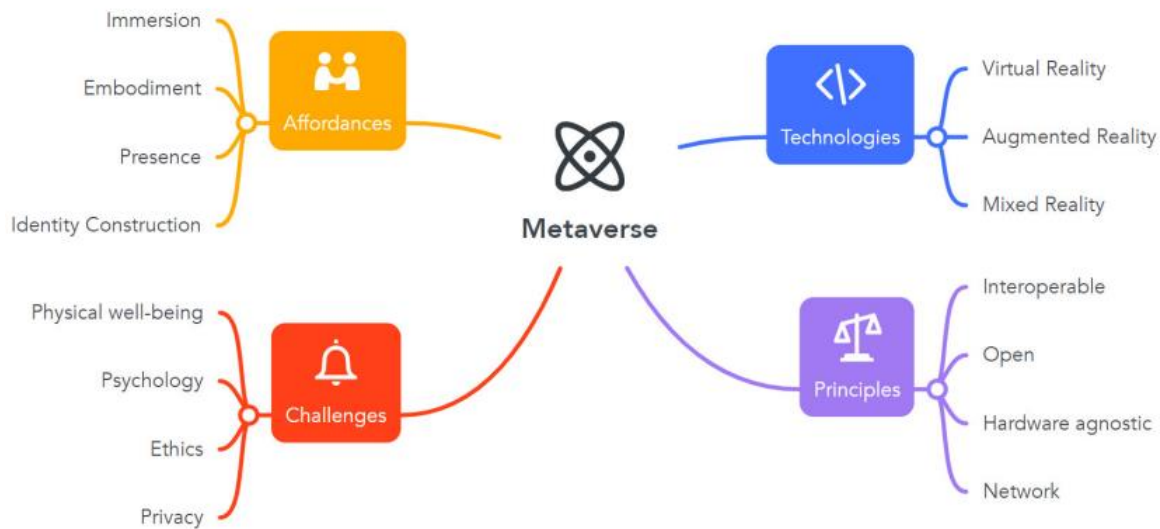


Fig. 3

2.4 Digital Discipline in Metaverse: In physical world ,when we connect people ,we follow certain social disciplines .On similar lines ,when we connect with people virtually ,we need to follow Digital Discipline which is a very important aspect of social media.The acts of indiscipline in metaverse may cause severe mental issues to users in comparison to interdisciplinary acts to traditional social media .With increasing immersiveness of Metaverse ,activities like ragging ,teasing ,bullying ,trolling ,blackmailing etc can see a major boom in near future .Children and women are the major victims of these kinds of activities .

2.5 Physical and Mental Health as a challenge for women:

2.5.1 Physical Health :As mentioned earlier AR is a gateway for Metaverse and it can be accessed by using high end AR devices like AR and VR headsets .Wearing such headsets for longer period of time can have an adverse effect on eyes and brain health. This may cause severe diseases like thyroid eye disease .Dry eyes may become a common problem.

2.5.2 Mental Health: Use of metaverse for entertainment, travel and leisure activities may bring escape and relief from stress and give you temporary pleasure but excessive use of metaverse can bring you mental health issues like paranoid ideation, depression, somatic symptoms and many more mental illnesses.

3. Solutions

1. Regulating the Metaverse space with strict rules to counter women related security threats.
2. Making women well equipped with prerequisite knowledge to operate Metaverse in a safer way
3. Women should not share their personal data with tech companies to avoid any kind of future hazards.
4. Authentication based on IP addresses should be used in Metaverse to make it easier to find out suspects in any kind of illegal activities that take place in Metaverse
5. Some Entry barriers should be introduced by Metaverse platforms .These entry barriers should restrict fake accounts; bot operated avatars, to safeguard digital security of users.
6. Safe modes should be enabled in the Metaverse for women so that women can explore the Metaverse without any worries.
7. Use of abusive words and inappropriate gestures performed by avatars should be restricted.
8. Users must have an option to block or to restrict certain avatars from entering their metaverse space.
9. User should opt for eye safe AR and VR headsets.
10. Fair and safe use of Metaverse should be ensured.

3. Conclusion- Metaverse is a technology with very bright future if used in correct way .As the Metaverse industry sees a boom from last few years ,this is the right time to ensure that we develop a safer Metaverse in future .Challenges faced with Metaverse can be solved by implementing the proposed solutions .

3. References-

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