



ADMM Cybersecurity and
Information Centre of Excellence

UPDATE ON THE INFORMATION DOMAIN

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Possibilities and Pitfalls of the Metaverse

INTRODUCTION

1. Over the years, technology has advanced exponentially, with new innovations and breakthroughs such as artificial intelligence, virtual and augmented reality emerging. In recent years, the concept of the metaverse, a collective virtual shared space, has garnered significant attention as it was seen as the next iteration of the internet.
2. The metaverse is an envisioned evolved state of the internet as a universal and immersive virtual world that is facilitated by virtual reality and augmented reality technology. Today, advancements in artificial intelligence, machine learning and blockchain technology are pushing the boundaries of what is possible in the metaverse.
3. The metaverse holds immense potential to revolutionise the way users interact with one another and consume media content within a computer-generated environment. Users can also create and customise their own avatars, explore virtual worlds, engage in social activities, and even conduct business transactions.

Opportunities for the Metaverse

4. The metaverse is premised upon a fully immersive environment that allows users to feel like they are living in a digital environment. Unlike the real world, which is constrained by time and space, different groups of people can share a virtual conference room together at the same time in a virtual space. For instance, soldiers, first responders, bus drivers, and even machines like autonomous cars and delivery drones can be trained for millions of hours in digital cities.
5. The metaverse can be helpful in upskilling people without compromising one's safety. For instance, the training of pilots can be achieved through simulations of aircraft cockpits. Combat strategies may also be developed through virtual military trainings. The United States and India have been adopting metaverse technology for military usage. *Business World* reported that India has built a training facility with wargame simulation to train officers and evaluate their tactics through metaverse-enabled gameplay. Factors such as terrain slope, weather, time, air pressure, enemy observation range, artillery range, troop position, soldier health, and enemy reaction capabilities were included in the simulation. With this set-up, soldiers can be better trained and prepared for various potential scenarios and outcomes of an enemy ambush attack.
6. Metaverse also has the potential to provide the education and medical research community with virtual cadavers to overcome resource constraints and limited accessibility to cadavers. *Forbes* reported that one potential application of the metaverse is in the healthcare industry, specifically, for diagnoses, treatments, and supporting recovery. Commonly referred to as “metamedicine”, the mixed reality technology can be used in operating rooms and specialised training seminars. Doctors could also provide remote care and make diagnoses through an immersive experience of the metaverse.

7. Metaverse also offers opportunities beyond specialised trainings and education. For instance, universities such as Monterrey Institute of Technology, are building virtual worlds to raise users' awareness and exposure to misinformation. In this virtual world, misinformation and disinformation becomes prevalent. To mitigate the negative consequences of misinformation and disinformation in the virtual society, users would need to work together and help to build up each other's information literacy. These virtual worlds, hence, allow for a wider group of audience to be engaged and be more aware of various misinformation trends.

Pitfalls associated with the metaverse

8. While the metaverse holds great potential to be a powerful tool in redefining trainings, education, and revolutionising information consumption, the potential for misinformation to be spread within the metaverse itself exist. Without appropriate content regulation efforts, the metaverse could be exploited by threat actors to spread false and malicious content beyond text and audio. As *Information Week Magazine* reported, information generated in a metaverse will be dynamic and fleeting due to real-time conversations and interactions between individuals. In other words, threat actors could stay anonymous – behind a virtual profile – and spread misinformation with ease.

9. Furthermore, the metaverse's access to vast amounts of personal data contributes to heightened cybersecurity threats arising from a larger attack surface, and increased vulnerabilities to privacy leakages. According to *Venture Beat*, just 20 minutes of virtual reality usage can generate two million unique data elements from multiple users. For instance, Face ID is often used as a security authentication feature, which can be problematic if the collected personal data is misused. Through capturing personal features such as pupil dilation or changes in facial expression, these algorithms can map users' body language and record subconscious emotional reactions from specific facial expressions to gather deeper insights. This is exacerbated by the fact that data collection in the metaverse is involuntary and continuous in nature, rendering the provision of individuals' consent to such data gathering almost impossible. As more digital identities are created within the Metaverse, the virtual space becomes a prime target for hackers and other malicious actors, raising concerns on data privacy and security. Hence, it remains imperative for government and

organisations to establish ethics principles, strict requirements for privacy and security, and standardised framework and specifications.

ASSESSMENT

10. Studies have shown that existing data protection frameworks are woefully inadequate for addressing the privacy implications arising from such advanced emerging technologies. Most existing biometrics laws such as the Protection of Personal Information Act (POPIA) – which prohibits processing of biometric information in South Africa, do not cover personally identifiable information on virtual spaces.

11. As such, organisations seeking to stake their claim in their nascent virtual realm must make data privacy and security top priorities as they build their metaverse. According to *Venture Beat*, organisations could develop a set of core ethics principles and guidelines to protect individuals' data. Key considerations include:

- Privacy: Who has access to, and how is such personal information used within the metaverse?
- Ownership: Who owns the digital assets, and what rights do they have over it?
- Control: Who oversees activities in the metaverse, and what rules and regulations should be implemented to guarantee fair use and equal treatment for all users?

12. In addition to data privacy mitigation measures, policies can be implemented to safeguard content shared in metaverse. According to *cointelegraph*, content moderation regulations should be placed on virtual worlds to ensure that the content shared in metaverse is safe, and do not violate community guidelines – for instance, hate speech, graphic violence or explicit materials should be prohibited. Features that allow users to report and flag content that they deem inappropriate or harmful should also be included.

13. Individuals should also be aware of the risks and challenges that come with virtual environments. Some of the steps to protect themselves include:

- Being cautious about the information shared online;
- Using strong passwords and two-factor authentication;
- Being mindful of phishing scams and malicious software; and
- Regularly reviewing the privacy settings on virtual accounts.

14. Ultimately, it is essential to ensure that the metaverse is developed and used in a responsible and ethical manner. By being proactive and taking steps to protect one's privacy and security, one can enjoy the many benefits of the metaverse while minimising the exposure to potential risks. The metaverse holds great potential to revolutionise the way we interact with digital technology. It is therefore imperative that we continue to be apprised of what it is, how it works and understand what we are up against, in order to confidently navigate this new space.

CONTACT DETAILS

All reports can be retrieved from our website at www.acice-asean.org/resource/.

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