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Enter the Battleverse: China's Metaverse War

Josh Baughman

Introduction

In China, 2021 was dubbed year one of the metaverse with extensive investment by local government, tech companies, major conferences, and studies all related to the development and future of the metaverse.¹ While there is not one authoritative definition recognized for the metaverse as it continues to evolve and develop, the basic idea is virtualizing and digitizing the real world. Stylianos Mystakidis, from the University of Patras, echoes this idea in his definition, “The Metaverse is the post-reality universe, a perpetual and persistent multiuser environment merging physical reality with digital virtuality.”² Others have referred to it as a “physical Internet where you don’t just watch content, you’re a whole person in it.”³ However the metaverse will come to be defined, it is clear China aims to be a leader in all related tech industries that will serve as the backbone of this emerging technology.

While most talk of the metaverse deals with civilian use, a growing discussion, particularly in China, has emerged related to potential military application. In recent articles published in the PLA Daily the authors explore what would be needed to build a separate military metaverse, dubbed the “battleverse”, potential benefits and even possible methods of attack of an adversary’s own metaverse. Although the metaverse is in its infancy now, degrading or disabling the metaverse could have dire consequences as society and even the military become more integrated and reliant on the technology.

Metaverse Mania

A tremendous explosion of interest and investment is happening in China revolving around the development of the metaverse. With a search of the word metaverse [元宇宙] with China National Knowledge Infrastructure [中国知网] (known more commonly as CNKI) over a thousand results are populated most from articles within the last six months. By the end of 2021, 11,000 trademarks by 1,600 firms containing the word metaverse had been filed. Cities such as Shanghai, Wuhan and Hefei included development of metaverse in their latest five-year plans. Their plans encourage application of the metaverse in public services, business office, social entertainment, industrial manufacturing, safety production, video games and other fields. Wuxi City established the Metaverse Innovation Alliance, and officially launched the Wuxi City Metaverse Industrial Park this year to promote technology related to the metaverse. Other cities also pushed forward metaverse development as Hangzhou established a Metaverse Special Committee, Sanya established NetEase’s Metaverse Industrial Base, Shenzhen established a Metaverse Innovation Lab and finally, in Beijing’s technological hub Zhonguancun an Internet Education Innovation Center was officially established, aiming to explore the combination of

metaverse and educational innovation, and promote the development of metaverse education applications.

Major studies on the metaverse were conducted by the prestigious Tsinghua University New Media Research Center and the China Institute of Contemporary International Relations (CCIR), a top tier think tank closely associated with the Ministry of State Security.¹ Tsinghua's paper mainly gives an overview description of the Metaverse and possible benefits, but does also warn of potential security concerns and societal impacts.⁴ CCIR's paper titled, "The Metaverse and National Security," focuses on potential impacts to China's national security. The paper identifies three areas of concern. First, technological hegemony, the idea that some countries will develop metaverse technology faster and cause instability in capability and access. Second, cyber and data security as reliance and use of the metaverse grows more sensitive data will be shared and may come to be considered a category of critical infrastructure. Finally, the third element explored how politics, economy and society of a country will be altered by the metaverse. CCIR's overall recommendation urged for the need of the government to coordinate development and safety in the regulatory process, and prepare technical rules and ethical standards in advance.

Major conferences were also held over the past year on the metaverse by the city of Zhejiang, the Ministry of Industry and Information Technology and tech giant Baidu. In Zhejiang's industry development symposium, having a great foundation with many of the technologies needed for the metaverse as well as home to Alibaba, Zhejiang believed they are well positioned to be at the forefront of developing metaverse technology. In the Ministry of Industry and Information Technology workshop, which included China's big tech firms Tencent, Baidu and Alibaba, there was general consensus the metaverse will be a groundbreaking technology for society, but risk countermeasures are needed as development continues. Finally, Baidu's Artificial Intelligence (AI) Developer Conference, held a conference in a metaverse with the use of their "XiYang" App [希壤] which can "accommodate 100,000 people to interact on the same screen at the same time."⁵

In February of this year the People's Liberation Army (PLA) joined in on the enthusiasm for the metaverse to bring in the Chinese New Year with their, "2022 Metaverse Military Network Spring Festival Gala."⁶ Hosts of the event were virtual avatars and broadcast live. A description of the event boasted, "Utilizing HTML 5 participants were guided by an integration of artificial intelligence, image recognition, semantic analysis, holographic imaging and other technologies."⁷

¹ China's civilian intelligence, security and secret police agency.



Figure 1. China's metaverse.

Making Sense of the Mania

Assessing the goals and strategic mindset of China's supreme leader Xi Jinping, a heavy investment in the metaverse is not surprising. The importance of technology and innovation is interlinked with China becoming a powerful nation with a focus on "self-reliance" and "indigenization." Technologies such as AI, 5G/6G, quantum computing, block chain, and many others have been a focal point at the national level. In the 1980s, then Secretary Xi of the Zhengding County Party Committee in Hebei, famously stated "technology is the key and information is the soul."⁸ In 2000, Xi Jinping, then governor of Fujian Province, made a strategic decision to build "Digital Fujian," and personally organized the preparation, research and deployment of the first five-year development plan for Digital Fujian. In 2003, Xi Jinping, the then Secretary of the Zhejiang Provincial Party Committee, insisted on the importance of driving industrialization with informatization, and speeding up the construction of "Digital Zhejiang."⁹ As the leader of China, Xi has continued this mindset stating in 2018:

"If China is to grow strong, prosperous, and rejuvenated, we most certainly need to develop science and technology in a big way. We must strive to become the world's main center of science and the high ground of innovation. We are closer than any time in history to the objective of the great rejuvenation of the Chinese nation, and we need more than any time in history to build China into a world science and technology superpower!"¹⁰

Xi emphasizes that China cannot simply be a follower, but a leader to, "accelerate the construction of first-mover advantages."¹¹ The internet in particular has been a major focus of the Chinese Communist Party. Last year Xi stated:

"The strategy of strengthening the country through the internet is an indispensable key step in the Chinese dream of the great rejuvenation of the Chinese nation. From entering Beijing in 1949

to "take the test" to "passing the test" in the Internet age, the times are changing, but what remains unchanged is the great mission of the Chinese Communists to seek happiness for the people and rejuvenation for the nation."¹²

Xi's sentiments can also be seen in China's "National Cyberspace Security Strategy" which focuses on the importance of sovereignty, the digital economy, norm shaping and cultural impact in cyberspace. The authors write, "Cyberspace has become a new area for important human activity of equal importance to land, sea, air and space, national sovereignty has extended and stretched into cyberspace, sovereignty in cyberspace has become an important component part of national sovereignty."¹³ As the metaverse represents the new frontier of cyberspace it is logical for the CCP to want to heavily invest and be a leader in the technology to better protect their own sovereignty rather than have another nation take that role.

Economically, taking the role of leader in metaverse technology has major positive impacts in their already rapidly expanding digital economy. The authors write the Internet, "has stimulated the adjustment of economic structures and the transformation of economic development methods, infusing the economy and society with a new momentum."¹⁴ To capitalize on this momentum and digital transformation leading the way on the metaverse could have an incredible impact on China's economy. If the metaverse is the next stage of the internet, whomever has the lead will benefit enormously with a potential user base numbering in the billions.

As a leader, China will also be in the position to guide international norms regarding the metaverse. The authors write, "Comprehensively move forward with bringing cyberspace under the rule of law, persist in governing the web according to the law, running the web according to the law and using the web according to the law, and let the Internet operate healthily and along a rule of law track."¹⁵ With the goal to "reform of the global Internet governance system," China could shape international norms in the metaverse and lead international organizations surrounding the metaverse.

Finally, as the leader of the metaverse, China could gain a potential soft power win. As the authors write the Internet, "has become a new channel for the dissemination of culture a new means for the provision of public cultural services. Online culture has become an important component part of cultural construction."¹⁶ Xi often talks of the internet in China as a community or "spiritual home."¹⁷ In a 2016 cyber symposium Xi stated, "Cyberspace is the common spiritual home of hundreds of millions of people."¹⁸ On November 19, 2021, in his congratulatory letter to the first China Cyber Civilization Conference, General Secretary Xi Jinping pointed out that cyber civilization is an important part of social civilization and an important area for building a strong cyber country. If the internet is China's "spiritual home" and the metaverse is the next evolution of the internet it is logical the CCP would be interested in playing a role in its development. The Party can

shape what Chinese people (and perhaps globally if they are able to capture the market) see, hear and even feel as they develop a metaverse civilization favorable to their own desires and strategic interests. Anything deemed harmful to the Party can be surgically cut out and censored.

Battleverse

The utility of the metaverse for the CCP does not end with civilians. While the PLA did host an event in the metaverse, the PLA have begun to think much further of more ways the military can apply the capability. A term has been dubbed for the military application of the metaverse, “battlefield metaverse” [战场元宇宙], or “battleverse” for short. The first mention of the “battleverse” [战场元宇宙] in Chinese media is in an article titled “Uncovering the Metaverse” [揭开“元宇宙”面纱] in the PLA Daily from November of last year.¹⁹ The idea they propose in this article is showing people the horrors of war within the metaverse to deter conflict. The authors write, “Imagine, if news reports can restore the scene of the war and create a ‘battleverse,’ so that people can feel the huge trauma caused by the war to human civilization in real time, and this shock will stimulate the human society's interest in peace.”²⁰ In this application the metaverse is not used by the military, but for civilians to understand the true impact warfare can have on human lives.

The news article from NetEase [网易] titled, “By developing the metaverse, we may be able to use more means to avoid wars and economic crises,” [发展元宇宙，或许能够多一些手段去避免战争和经济危机的发生] also takes a very positive perspective on the metaverse. The article’s authors believe the metaverse (and the technology to make it possible) could help avoid economic, climate and natural disaster crises. The very nature of the metaverse could help bring about solutions, the authors write because, “the metaverse is separated from the constraints of the real world and is directly based on the consciousness and subconsciousness of human beings, a civilization based on the metaverse may be able to find a better path to solve some of the problems that humans in the real world cannot think of a good way to solve.”²¹



Figure 2. Key technologies will support the Battleverse.

In a late January edition of PLA Daily, in an article titled, “Looking Forward to Battleverse” [前瞻‘战场元宇宙’], the idea of the “battleverse” shifted dramatically.²² Its authors describe the “battleverse” as the manifestation of the metaverse in the military field. They provide the reader with an example of the possible use in the future with a training exercise on an aircraft carrier conducted in the battleverse. Aside from those driving and navigating the aircraft carrier everyone on the ship would be involved. Commands would be given to simulate a war case scenario and pilots would “enter the cockpit of the virtual world.”²³ They caveat this scenario by stating the battleverse requires, “breakthroughs in a large number of key technologies as basic support, including VR/AR/MR technology, digital twin technology, cloud computing technology, blockchain technology, high-speed network technology, AI technology, etc.”²⁴



Figure 3. The Battleverse.

In the next section the article’s authors go into details on the basic conditions needed to make a battleverse operational (see Table 1 below).

Table 1. Conditions needed to make the battleverse operational.

Condition	Description
Independent Network Communication Links	Users should log into separate military high-speed network architecture inaccessible by civilians.
Authentication Security	A strict screening process should be in place to gain access. Identity cannot be tampered with, fictitious or fraudulent. All users' operations will be recorded.
Diversified User Access	Users will have designated roles and responsibilities. There will be a clear coordination and interaction relationship. All events will be unified by a single event organizer.
Immersive Real Time Interaction	Achieve real time interaction with the “battleverse” and other users in the real world.
Powerful AI Bots	AI Bots will be given intelligent and autonomous behavioral capabilities. They will act as virtual red, blue, and third party entities to participate in combat and training. Additionally, they can act as instructors, examiners, staff officers, system operation and maintenance personnel to assist individual users in

Condition	Description
	decision-making and actions.
Realistic Performance Simulation	All weapons and information systems mapped in the “battleverse” need to have real-world equivalent functional performance and consistent operation to enhance actual combat ability.
Flexible Scene Generation Capability	Each activity will have a realistic geographical, electromagnetic, meteorological and hydrological environment.

With the parameters met to build a fully functioning “battleverse” the article’s authors describe the major benefits and impact on the military (see Table 2).

Table 2. Battleverse benefits and impacts to the military.

Benefit	Description
Education	The “battleverse” will play an important role in centralized education allowing free communication with teachers and students no matter the location. Virtual teaching tools will also enhance the teacher’s ability to explain new concepts.
Training	Ability to fully meet the actual combat requirements in the context of a large-scale operation. Under repeated training and assessments will help hone soldiers’ tactical cooperation and will to fight. Evaluation will be more quantitative and help quickly discern the most talented soldiers.
Testing	New weapons can be tested in simulations to assess performance, compatibility, and overall combat effectiveness.
Research	Coordinate expert resources no matter their physical location. Platform for remote deduction and verification of new equipment and innovation of tactics. Conduct continuous analysis and obtain massive data sets to analyze and meet research goals.
Backup Communication	If normal means of command communication are destroyed in a battle, the “battleverse” can act as a backup communication system.

Already the PLA is working on centralized education that could be a precursor to the battleverse called “cloud party school” [云党校]. Where once the

PLA was made up mainly of soldiers with middle school and high school degrees there have been great strides to modernize the PLA by placing a premium on education. In an article titled, “Developing the Informatization Wing of the Military” [为军队党建插上信息化翅膀], the author writes, “Relying on the strong military network, we have concentrated efforts to open the ‘Cloud Party School’ to combine the traditional advantages of military party building with modernization.”²⁵ The idea is to build a platform where soldiers can “connect, live and play”. Because soldiers are scattered across China (and some international assignments) some units have limited educational resources. With the cloud party school resources can be disseminated via the cloud and everyone can access resources where they can be “taught anytime, anywhere.”²⁶ Moreover, the system is also tailored in a way to meet the needs of individuals. If a soldier is weak in an area or has specific interest their experience can be tailored to their needs. The cloud party school acts as a, “a one-stop learning portal can integrate high-quality military and local resources.”²⁷ Conceivably, a battleverse version of the cloud party school would be more immersive and even better at educating the military force.

“Actual combat” [实战化] is at the cornerstone of all training in the PLA and a major focus of Xi. The idea is to simulate actual combat as closely as possible with training in order to ensure success in a conflict with an adversary. Part of helping soldiers train in actual combat scenarios is that the PLA has utilized Virtual Reality (VR) simulations. This is cost effective and allows for significantly more training to occur. In the latest use of this type of training the PLA has introduced a VR parachute training system for new paratroopers. The program, “uses spatial positioning, virtual simulation and other technologies to build a realistic parachute environment, allowing new paratroopers to perceive different aerial emergencies, thereby reducing risks in actual parachute jump.”²⁸ Each VR jump data is collected to help troops train in the most effective manner. The result is that the simulation, “improves the training level of the paratroopers, but also provides them a platform to experience new parachute types, unfamiliar environments, and new training subjects, which can greatly help the paratroopers adapt to different battlefield needs and improve their actual combat skills.”²⁹ This same technology could be brought to the broader battleverse in a more integrated way where there is a larger joint operation occurring and paratroopers are just one aspect. Simulated joint operations in the battleverse could also be used to test simulated prototype weapons in various combat scenarios. Weapon researchers would be provided with incredible amounts of data that they could analyze together no matter their location.

United States’ “Battleverse”

Although the United States does not use the word “battleverse” it is clear it has a similar view about the benefits a military metaverse can provide. The idea of using virtual worlds to help soldiers prepare for war can be traced back to the 1980s with SIMNET, which was a wide-area network with various vehicle simulators built to provide a real-time, distributed combat simulation. In more recent decades the standard of Distributed Interactive Simulation and High-Level Architecture for conducting real-time, platform-level wargaming across multiple host computers

was developed. Across the military branches these types of technologies are used to prepare soldiers for combat. More recently the U.S. military’s newest branch, Space Force (USSF), has identified an investment in the metaverse as critical to their success. Space Force’s recently appointed Chief Technology and Innovation Officer, Lisa A. Costa, stated in February 2022, at the first-ever Armed Forces Communications and Electronics Association (AFCEA) Space Force Information Technology (IT) Day, that USSF should, “take advantage of the investments that industry is going to be making in the metaverse. Those technologies could be used for training as well as for operations. And, incorporated into a digital engineering ecosystem, operator feedback could be used to automatically improve the product in its next iteration.”³⁰

Costa makes the comparison to other branches of the military saying that unlike other soldiers, a sailor who has the “opportunity of feeling the sun on your face, the waves underneath the boat, and the smell of the sea,” Guardians can only experience their domain of operations through digital data.³¹ She believes focusing on augmented reality, virtual reality, and haptic devices that provide users physical feedback from a virtual environment would offer novel ways to turn that data into situational awareness for space operators. This would prepare Guardians to make faster decisions at “the speed of the mission.”³²

Conflict in the Metaverse

In the latest PLA Daily article, published on March 3, 2022, titled, “The Metaverse: The New Heights of Future Cognitive Warfare” [元宇宙：未来认知战的新高地], the tone shifts again as the authors explain the extension of cognitive war into the metaverse.³³ Important to note is the authors are from the Institute of Military Political Work, Academy of Military Sciences, which is the highest-level research institute of the PLA and directly subordinate to the Central Military Commission,³⁴ which could connote a certain level of authority.

The authors describe the metaverse as a highly developed cognitive world; in essence, a virtual extension of reality. As the authors write, “The metaverse provides a parallel cognitive space that digitally twins real combat scenarios, where cognitive warfare can be advanced efficiently and enhanced at a fast pace.” While the authors do acknowledge the benefits of the “battleverse,” they do also anticipate it will be an area for attack and conflict. By attacking an adversary's metaverse (and in cognitive war more broadly), one can, “affect the opponent’s thinking, cognition and action decision making.”³⁵ The authors provide three styles of confrontation as shown in Table 3.

Table 3. Three styles of confrontation.

Confrontation Style	Description
Platform Confrontation	When hostile countries and armies use the metaverse there will be cognitive defensive and offensive operations to disrupt, delay,

Confrontation Style	Description
	deter, destroy, and eliminate the existence and operation of the opponent's metaverse.
System Attack (Supply Chain)	Attack and block key nodes and technological operation chains that support an adversary's metaverse.
Indirect Diversion	Impair communication technology devices and use deceptive means to alter the functionality of an adversary's metaverse system. ⁱⁱ The goal is to cause the adversary confusion and misunderstanding.

The idea that there will be competition and conflict associated with the metaverse is not exclusive to this article. In the *Northeast Window Magazine*ⁱⁱⁱ [东北之窗] there is an article titled, “Who Can Win the Metaverse” [谁能赢得元宇宙]. The author believes that while in a technological and capital sense the United States is “far ahead in the metaverse,” but from a “cultural and substantive standpoint” China is superior.”³⁶ The author points out that social media platforms such as Chinese developed TikTok are better able to capture what the people want. The Chinese approach to the metaverse is more grassroots based and thus, much better suited to the needs of the people.

In another article “New Battlefield–Metaverse” [新战场--元宇宙], the author places the metaverse as an extension of the great power competition between the United States and China.³⁷ The author writes, “In the future, China and the United States will inevitably compete in the metaverse.”³⁸ The metaverse, while still in its infancy, will become a reflection of real society in the future and questions on jurisdiction will be one of many areas of conflict between the two nations.

Conclusion

Metaverse is a nascent technology and thus, it is hard to assess what impact it will have on society, politics, the economy, international norms, national security and society as a whole. We are at the precipice of a technology that could see billions of simultaneous users that reshape how society consumes media and interacts with one another. With the stated goal of achieving the “innovation high ground,” China is positioning itself to lead and potentially dominate in metaverse development with investment and backing by some of its largest tech companies as well as the Chinese Communist Party itself. The Party’s own cyberspace security strategy emphasizes the importance of sovereignty, international norms building, developing the digital

ⁱⁱ Refer to this study for examples of this type of attack. The authors give an in depth look at how to hack into VR systems to disorient and confuse users. Casey, P., Baggili, I., & Yarramreddy, A. (2019). Immersive Virtual Reality Attacks and the Human Joystick. *IEEE Transactions on Dependable and Secure Computing*.

ⁱⁱⁱ Comprehensive periodical of current affairs and finance.

economy and expanding the culture of China. To achieve these strategic objectives in cyberspace, China believes it needs to be a first mover in metaverse technology so that it can shape the future of the Internet. This same mindset can be applied to the Chinese military to build a “battleverse” that enhances the PLA’s ability in education, training, testing, research and backup communications that could provide for significant military advantages. Better training, research and education will lead to a more effective and lethal fighting force.

Additionally, a potential conflict may arise as the metaverse is implemented and relied upon like the internet. The information technology sector is already identified as a critical infrastructure³⁹ and the metaverse will be part of that when it becomes operational. Perhaps, the metaverse will become so seamless that the lines between the internet and reality become blurred. As society, including the military, rely on the metaverse in daily operation there will be greater risk and potential consequences to disruption or destruction of the metaverse. The PLA Daily article on cognitive war already shows the possible attacks and potential damage that could be caused in the metaverse. Norms must be created to prevent possible conflict, but the ecosystem itself must also be made resilient as the metaverse becomes a key target in war.

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