

ARTICLE

# Transforming Public Service Delivery in Indonesia: Exploring the Potentials and Challenges of Metaverse

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## ABSTRACT

The metaverse could transform public services. Service accessibility, efficiency, and quality can be improved through this technology. This article addresses these research questions: How does the Indonesian government use metaverse in public service? What are the primary narratives and counter-narratives around metaverse-based public services in Indonesia? Which Indonesian public service using metaverse is most promising? This research evaluates and identifies public policy using the Narrative Policy Framework (NPF). Characters, setting, plot, and morals are identified for NPF analysis. According to the study, the metaverse may improve public service accessibility, efficiency, and efficacy. Infrastructure deficiency, technology allocation, and budget consideration must be considered while developing the metaverse.

## A. INTRODUCTION

Remember how complicated it was to manage administrative documents? Imagine if all of that could be solved quickly, comfortably and effectively. Imagine if your classroom was an immersive 3D virtual world (Lin, Wan, Gan, Chen, & Chao, 2022). Even doctor consultations no longer need to travel for hours (Chengoden et al., 2023). It is possible to use the metaverse, where we can interact, work, and play just like in the real world. Metaverse may sound like a science fiction movie imagination, but now this technology is proliferating and can potentially change many things, including public service.

Accessing public services has often been challenging for people in remote parts of the country. Metaverse, especially with AI, acts as a connecting bridge, enabling residents to easily manage administrative documents, consult professionals, or attend training sessions, regardless of location.

Metaverse cannot only make access more manageable but also make public services more efficient. Existing resources can also be allocated more optimally (Choi, 2022). The advantage of the metaverse is that it could increase transparency and reduce the potential for fraud (Moreno & Castro, 2023). Every public service transaction is recorded safely and transparently, so public trust in the government can increase. Metaverse World offers a myriad of opportunities for the advancement of public services in Indonesia. In the government context, virtual public services make the process of managing documents, paying taxes, and reporting

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faster and more efficient (Ibrahim, Baharuddin, & Wance, 2023; Khairunnisa, Nurmandi, Purwaningsi, Loilatu, & Savira, 2023). Although still in its early stages, the metaverse has great potential to revolutionize public services in Indonesia (Julian, Chung, & Wang, 2023). Metaverse can help realize more fair, efficient, and qualified public services for all Indonesians.

There are several successful examples of the implementation of digitalization for public services. South Korea has created a virtual world where citizens can access government services, attend meetings, and interact with officials online (Hwang & Koo, 2023; Kim & Kim, 2024). This makes government easy to use and improves communication. Meanwhile, the United Arab Emirates is building a virtual city where people can live, work, and use government services online (Alawadhi et al., 2022; Jeljeli, Farhi, & Zahra, 2023). This will attract businesses and improve people's lives. These countries show how the metaverse can change how governments work and serve their people.

Metaverse could revolutionize Indonesian public services to be more accessible, efficient, and effective. Public service metaverse opportunities include: (a). metaverse can make public services more accessible. Metaverse allows remote communication with public service officials (Radanliev et al., 2023), (b). metaverse can help the government increase the efficiency of public services. With metaverse, the government can reduce operational costs, such as office rental and labour costs (Letafati & Otoum, 2023), (c). Improving the quality of public services can help the government improve the quality of public services (Veeraiah et al., 2022).

With metaverse, the government can provide more personalized and interactive public services. The metaverse can also help the government provide public education and training (Lee & Hwang, 2022). A virtual public service mall is an example of applying the metaverse to public services. With a virtual public service mall, people can manage various administrative documents without visiting the service office directly (Sari, 2018). The Indonesian government has demonstrated its commitment to utilizing metaverse in public services (Bansal, Rajgopal, Chamola, Xiong, & Niyato, 2022; Chengoden et al., 2023). This can be seen from various initiatives, such as developing virtual public service malls in several regions. Even though it is still in its early stages, applying the metaverse in public services has great potential to improve people's quality of life.

Metaverse technology in Indonesia is starting to be heralded because it makes it easier to interact with individuals virtually. The president of Indonesia, Jokowi, believes that Indonesia needs to adopt digital technology to leap in development (Kominfo RI, 2022). The Populix survey found that 29% of Indonesians know about metaverse. 42% of Indonesians are interested in the metaverse. Up to 7% of respondents were uninterested (Populix, 2022). The Head of Research at Microsoft Research, Mar Gonzales Franco, said people could be more connected and comfortable working with *metaverse* rather than audio-based (Data Indonesia, 2022). This conclusion aligns with the metaverse's potential to transform public services in Indonesia. There have been several initiatives to use metaverse for public service. Some examples of the application of metaverse in public services in Indonesia: (a) Bandung Municipal Government has launched "Bandung Metaverse" to provide virtual public services such as citizenship card, driver's license, and tax payment (Arfiansyah & Han, 2020). (b) The Ministry of Education, Culture, Research, and Technology has developed an "Education Metaverse" platform to provide access to virtual and interactive learning (Hendayana, 2022). (c) The Ministry of Health has launched "Telemedicine Metaverse" to provide virtual health services to people in remote areas (Rachmad, 2022). Although the metaverse offers a lot of potential to improve public services in Indonesia, there are some negative or cons to consider, such as the digital divide, cost and security, and ethics (Heruatmadja & Ramadhan, 2023; Louca & Chavan, 2023; Santi & Hasanah, 2022). It is important to consider various negative or con opinions towards metaverse before applying it widely in public services in Indonesia.

With a comprehensive perspective, careful planning, public education, and transparent regulations, the metaverse needs to be thoroughly observed to be pushed into a proper policy agenda to improve public service in Indonesia.

The following research questions are explored in this article: How is metaverse used in Indonesian public services? What narratives and counter-narratives develop when applying metaverse to public services in Indonesia? What are the primary recommendations? Indonesian public service delivery through the metaverse is the first research question. The second research question concerns the metaverse's main narratives and counter-narratives for public services in Indonesia. Answering this question helps explain metaverse implementation viewpoints and helps the government and stakeholders solve metaverse implementation issues.

## **B. LITERATURE REVIEW**

Metaverse is a term that refers to a virtual world where users can carry out various activities like in the real world. The term metaverse is increasingly popular, and metaverse in *crypto* has become a tempting investment (Ng, 2022). Pervasive virtual worlds that partially overlay and enrich the physical world from the metaverse. Avatar-based users can interact and consume user-generated content in immersive, scalable, synchronous, and permanent virtual environments (Weinberger, 2022). Connected virtual communities make up the metaverse. This community uses VR or AR technology to connect, work, play, and buy and sell like in the real world (Scheidung, 2022). Accenture released the Accenture Technology Vision 2022 research to determine the latest technical developments shaping a firm. The results showed that 55% of respondents thought metaverse technology helped organizations, and 25% thought metaverse technology would revolutionize (antaranews.com, 2022). Meanwhile, regarding the four trends that might occur in developing the metaverse in Indonesia.

The first is related to "*WebMe*". Indonesia's metaverse will lead to a three-dimensional or 3D environment. Based on the survey results, 93% of respondents believe digital platforms need to offer a unified experience to enable the use of customer data across several platforms and digital spaces in the future. The second trend is related to *the "Programmable World."* It means that the environment in the metaverse will shape people's interactions in the virtual world and redefine things within it. The third trend concerns "*The Unreal*". This means that businesses and the environment in the metaverse are increasingly supported by human artificial intelligence data, often called artificial intelligence (AI). AI will also show us which people are genuine and which are not in the metaverse world. This trend is supported by research results from Accenture, which show that 92% of respondents are committed to validating data sources using authentic human-made AI technology. The fourth or final trend is "*computing the impossible.*" The metaverse will also encourage organizations in all industry lines to expand the scope of work that can be done using computers. This trend is also supported by research results, which show that 88% of respondents said long-term success will depend on the use of technology in the next generation. Metaverse is the latest version of virtual reality (VR) without a computer. Technology users can enter the virtual world using devices like headsets or glasses based on augmented reality.

While proponents argue that the metaverse can revolutionize service delivery through immersive experiences, enhanced accessibility, and data-driven decision-making, critics raise concerns about the digital divide, privacy implications, and the potential for misinformation. Questions surrounding the economic feasibility, technical infrastructure, and public acceptance of metaverse technology in the public sector also fuel ongoing discussions (Al-kfairy, Ahmed, & Khalil, 2024; Guo, Wang, Peng, Zhuang, & Yang, 2024). As technology evolves, finding the balance between innovation and public interest remains a central challenge.

Meta Indonesia's Country Director, Pieter Lydian, pledged to develop the metaverse. Metaverse development is expected to take 5–10 years. The metaverse is expected to create digital economic prospects in Indonesia by merging AR and VR (Sulistyo, Sukmajatnika, & Syaputra, 2024). The Accenture Technology Vision 2022 report claims that 52% of Indonesian consumers believe digital life is becoming more accurate (Accenture, 2022). PwC research states that VR and AR technology on the metaverse can increase global Gross Domestic Product (GDP) by 1.4 trillion US dollars in 2030. Even though it has excellent business opportunities, metaverse in Indonesia also faces many challenges requiring crypto, blockchain, and NFT support that runs well (Jelita, 2022).

Moreover, the development of augmented and virtual reality still needs improvement. Metaverse development also relies on a strong 5G network. (Weiqi, 2022). In this regard, the government is aggressively building a 5G ecosystem in Indonesia. VR and metaverse development in Indonesia must be adapted to the existing telecommunications infrastructure. The products and services issued must pay attention to these aspects to run optimally with the average internet speed in Indonesia. In the next five years, developing a metaverse world or more optimal use of VR and AR in Indonesia can be done in the education, HR, and entertainment sectors. The issue will be the limitations of privacy, and privacy must be protected.

Nevertheless, imagine we can build property there later and hold concerts, cooking demonstrations, and other activities. It can later be connected to existing commerce. What is most likely in Indonesia in the next five years will remain in the education and human development sectors.

### C. METHOD

*Narrative Policy Framework* is a research approach to assess and identify specific public policies. NPF describes and analyses policy problems by developing narratives and arguments, especially contradictory ones, to stabilize the assumptions built (Jones, Smith-Walter, McBeth, & Shanahan, 2023). Policy arguments and narratives are the sources of political life because they strategically influence public opinion through official speeches, media opinions, or mass media comments (Shanahan, Jones, & McBeth, 2015). The NPF is useful for metaverse public service narrative analysis. The analysis must also answer the main components of the NPF: the policy narrative form (structure), which describes the problem as a manifestation of the assumptions in the narrative framework, and the policy narrative content, which is the story behind the arguments, to describe the narrative as a whole. These two components must be explained in detail in policy studies: (1) the setting or context of the problem; (2) the plot, which explains temporal elements (beginning, middle, end); (3) the character, which describes the actors involved, such as problem solvers (heroes), problem causes (villains), and victims; and (4) the moral, which offers policy solutions (Smith-Walter & Jones, 2020).

NPF research has various stages (Kuenzler, 2021): (1). NPF research begins with policy topic selection. (2). NPF research uses video, pictures, and text. (3). Data is analyzed using NPF. NPF analyzes character, place, story, and moral. (4). Answering research questions requires data analysis. (5). Post-NPF research discussions and recommendations are shared. Textual policy documents, news reports, bureaucratic formulations, and related source vocal utterances are NPF data sources (Browne, Coffey, Cook, Meiklejohn, & Palermo, 2019). Here are the following potential sources:

Table 1. Data Type and Categorization

| No | Type                                     | Category   |
|----|--|--|
| 1  | Indonesian Government Documents          | official reports, policy briefs, speeches, or statements by government officials related to the metaverse and public services                          |
| 2  | News Articles and Media Reports          | public discourse, stakeholder perspectives, and potential challenges surrounding the metaverse's implementation  |
| 3  | Industry Reports and Market Analysis     | information on the current state of metaverse technology, its potential applications, and the challenges and opportunities for public service delivery |
| 4  | Case Studies and Pilot Project           | Existing examples of metaverse applications in public services and best practices in Indonesia   |
| 5  | Relevant Legal and Regulatory Frameworks | Indonesia's legal and regulatory landscape concerns data privacy, cybersecurity, and e-governance.   |

Any research project must first determine its scope. This requires defining the metaverse research project's focus. Metaverse research is a new trend; hence, few relevant documents may exist. Multiple search strategies can find appropriate materials. Exploring texts from identifiable papers can reveal hidden treasures. Extracting useful information from a suitable set of documents follows. Coding labels and code text to categorize and evaluate data. The research questions will determine the coding scheme. Coding must be consistent and reliable. Inter-coder reliability checks let researchers assign codes consistently. Researchers can analyze the metaverse and its effects on public services by carefully picking documents and using a structured coding technique. Therefore, this study will apply qualitative and descriptive-analytical approaches to comprehend the issues fully. A literature study collects data from books, policy documents, journals, media headlines, and websites of the actors being studied.

## D. RESULT AND DISCUSSION

### Metaverse Implementation for Public Services in Indonesia

Several metaverse technology implementations by Indonesian central and regional governments are identified in this section. It examined metaverse application forms and categorization. The following table shows the identification results distribution:

Table 2. Several Types and Forms of Metaverse Application in Local Government

| No | Location                        | Use                | Form of Implementation   |
|----|---------------------------------|--------------------|--|
| 1  | West Java Provincial Government | Licensing Services | The West Java Provincial Government launched Indonesia's first Digital Public Service Mall (MPP). Digital MPP boosts public services and stimulates districts/cities that do not yet have a physical MPP. With MPP Digital, people click <a href="https://mppdigital.jabarprov.go.id/">https://mppdigital.jabarprov.go.id/</a>                       |
| 2  | Semarang City Government        | Licensing Services | The Semarang City Government aims to use metaverse-based technology for community convenience. The metaverse will be deployed later in Semarang's Public Service Mall (MPP). Online permit processing is available to Semarang City residents.   |
| 3  | Kendari City Government         | Licensing Services | The technology company PT Abadi Berkarya Indonesia is collaborating with the Kendari City Government, Southeast Sulawesi, to develop a metaverse-based public service called "Kendari Metaverse." Currently running virtual 3D from the Public Service Mall in Kendari, which will later be developed for public services.                           |
| 4  | Jakarta Provincial Government   | Licensing Services | <i>metaverse</i> platform as an effort to support Jakarta's vision of being a developed city through excellent public services. The DKI Jakarta Provincial Government has partnered strategically with PT WIR Asia Tbk (WIR Group) to develop a metaverse platform.  |
| 5  | Sumedang Regency Government     | Licensing Services | The Sumedang Regency Government is going digital through MPP, from web-based to app-based. Wakepo, the Sumedang Regency Government's messaging-based transformation tool, is also being used. The district government is developing the Sumedang Public Service Meta Verse (Super Meta) with the Ministry of Administrative and Bureaucratic Reform. |

| No | Location                         | Use                           | Form of Implementation  |
|----|----------------------------------|-------------------------------|---|
| 6  | Makasar City Government          | Municipal Information Service | Makaverse or Makassar Metaverse emphasizes 24/7 public services, such as Makaverse application in city cells, corridors, or alleys. QR Code databases exist for 229 of 1,096 tourist alleyways. ID, KTP, family data, digital address in coordinates, health data, and financial data are in the QR Code. CCTV, WiFi, and avatars are in 1,966 tourist lanes. Their three-dimensional design helps law enforcement monitor alley crimes.      |
| 7  | The Ministry of Internal Affairs | Consultation Services         | The Ministry of Home Affairs' Regional Autonomy Virtual Consultation Service (Kovi Otda) uses the metaverse to prevent government corruption. Metaverse technology or 3D animation can help local governments with virtual regional autonomy consultations. Local governments can access these services at <a href="http://www.kovi.otda.kemendagri.go.id">www.kovi.otda.kemendagri.go.id</a> with special Ministry of Home Affairs accounts. |

Source: Data Analysis, 2023

The table above illustrates that metaverse technology is mainly used for licensing services. According to regulatory backing, local governments should create physical and digital Public Service Malls. Each regional government has innovation possibilities. Makassar City Government uses metaverse in urban information services. Another example is using metaverse to improve the Ministry of Internal Affairs - local government consultations in Indonesia. These growing differences illustrate that regional factors, public requirements, and resource-carrying capacity can determine local government metaverse implementation.

### **Narrative Policy Analysis Metaverse in Public Services in Indonesia**

The policy narrative structure for metaverse in public services in Indonesia is discussed here. This research analyzes the meso-level narrative of the Indonesian Government as a policy-maker who uses the metaverse to manage government matters. The administration believes the metaverse can improve people's lives. The meso level analyzes narratives inside specific groups, organizations, or policy subsystems, not macro (societal or cultural) or micro (individual). The meso level is important when studying policy area organizations, interest groups, or networks. The meso level is best for learning how Indonesian government agencies, NGOs, and tech corporations design metaverse use in public services.

Several times, President Jokowi has discussed metaverse in public settings. President Joko Widodo met Meta founder Mark Zuckerberg at Facebook's Menlo Park HQ. Jokowi was invited to play Oculus table tennis during the meeting. While playing virtual reality, Zuckerberg told Jokowi that in 10-15 years, he will look like us playing ping pong. Everybody may buy virtual land, construct a virtual business, and there will be a virtual mall, gym, office, and tourism, Zuckerberg said at the Digital Generation Acceleration Movement's Jakarta Convention Center launch ([CNBC Indonesia, 2021](#)). On December 22, 2022, he opened the 34th Nahdlatul Ulama (NU) Congress at the Darussaadah Islamic Boarding School in Gunung Sugih District, Central Lampung Regency. President Jokowi mentioned Facebook's metaverse, which is being constructed. Metaverse integrates social networking, games, AR, VR, and cryptocurrencies to facilitate virtual interactions. Jokowi confirmed that the virtual world will emerge significantly because the COVID-19 pandemic has expedited the digitalization revolution. All preaching and recitations will be virtual, but it will feel like we are meeting here, not just via video conferences ([merdeka.com, 2021](#)).

President Jokowi's launch of the national capital Metaverse on Jagat Nusantara showed his commitment to promoting the use of metaverse internationally. This metaverse will allow people to learn and meet wonderful people from Indonesia and worldwide. It also allows local products to be sold worldwide ([Kompas Cyber Media, 2022](#)). President Jokowi's favourite notion is building a metaverse for the public sector, which central and regional government agencies should follow. Development takes numerous forms, but public service jobs seem the

most significant. A federal and regional government group is this issue's protagonist. Cybercriminals and community groups reject metaverse public affairs administration.

The OECD defines cybercrime as all illegal data transmission. That makes all computer crimes felonies. Cybercriminals threaten government metaverse development. Community groups opposing Metaverse policies may also struggle. This community group links the Metaverse policy to the urgency of strengthening human resources, equalizing access to technological infrastructure in regions, and improving public service organizations before directly procuring Metaverse technology, which will not directly affect all communities. This disadvantages public service consumers because they should have had alternative technological options but must continue to follow conventional public service processes and sometimes receive unavailable services.

Table 3. Policy Narrative Structure and Policy Narrative Content of Metaverse in Public Services in Indonesia

| <i>Policy narrative form (policy narrative structure)</i> |  |
|---|--|
| Levels of analysis  | Meso: As a policy-making actor, the Indonesian government believes that metaverse can be used through implementing ITE law. This means that the metaverse is only used for things that positively impact people's lives—however, several community groups oppose this policy.  |
| Settings  | President Joko Widodo spoke about the metaverse at the 34th Nahdlatul Ulama (PBNU) Executive Conference in December 2021. In mid-May 2022, President Jokowi met with Elon Musk in the Stargate Space Building, generating media attention. X, Texas. Finally, the IKN Nusantara metaverse was included in an interlude agenda during the G20 Summit on November 15, 2022, at the Apurva Hotel in Bali to demonstrate pro-metaverse policies.   |
| Characters  | Protagonist ( <i>Heroes</i> ): the government (the Ministry of Internal Affairs, The Ministry of Communication and Information, Regional Government)<br>Antagonists ( <i>Villains</i> ): Cybercriminal groups and community groups who do not support the implementation of the metaverse in government services<br>Victims: people trapped in conventional public service processes and their pathologies, especially the younger generation.   |
| Plots   | President Jokowi has ordered the relevant ministers to prepare efforts and strategies to develop metaverse technology.<br>Metaverse technology has begun to be developed by government and private parties. The National Development Planning Agency of the Republic of Indonesia (Bappenas RI) designs the New Capital City (IKN) modelling as a metaverse. WIR Group CAKAP is developing a metaverse in the education sector.<br>Transactions in the Metaverse are considered legally valid when they comply with the provisions of Article 1320 of the Civil Code, especially in the blockchain system; there are smart contracts that can guarantee the validity of the agreement.<br>There has been resistance from various groups regarding the government's stance, especially regarding pro-public policy priorities and cyber security. |
| Moral message   | The government needs to create a metaverse policy priority strategy that covers urgent sectors in its development and examines the negative potential for misuse of personal data and cyber crimes that are at risk of occurring.  |
| <i>Policy Narrative Content</i>                           |  |
| Value System ( <i>Belief System</i> )                     | The metaverse is at risk of becoming a medium for cyber crime terrorism and impacting social pathology in society.<br>Metaverse has benefits in the form of interaction and provision of public services that are more effective, efficient, and productive.<br>Strengthening metaverse development policy strategies that pay attention to cyber security aspects and social impacts on society;  |
| Strategy  | We must integrate metaverse development policies for public affairs with electronic information technology and personal data protection policies.<br>Socialization of good practices in metaverse development to strengthen public services in government  |

Source: Data Analysis, 2023

President Jokowi directs government agencies to adopt the Metaverse development strategy. In December 2021, Indonesian President Joko Widodo launched the Digital Generation Acceleration Movement at the Jakarta Convention Center (JCC). The Head of the State claimed the pandemic boosted Indonesia's digital market. Indonesia needs a plan to stay ahead. Jokowi said preparing many digital talents and finding mentors was the hardest. President stressed that Indonesia must produce this large amount to compete with other nations. He suggested that all technologies and significant enterprises accommodate students and internships to accelerate advancement. The president also wants better digital governance (Nafi'ah, 2023; Sobari, Pohan, & Priandani, 2023). Our digital economy will thrive with the infrastructure, talent, administration, and rules to develop a digital community ecosystem. President believes the Ministry of BUMN's Red and White Fund, Narasi Indonesia Digital Tribe, and the Ministry of Education, Culture, Research, and Technology's Micro-credentials can accelerate digital ecosystem growth. The Indonesia Digital Tribe by Minister of Education and Culture Najwa Shihab and the Merah Putih Fund are other digital talent projects. A digital society and ecology will accelerate soon (Putra, 2021). The Ministry of National Development Planning (PPN) and Bappenas, planning a capital city, take this seriously. Suharso says the Draft Law on National Capital (RUU IKN) does not include this notion. A presidential regulation will use virtual world technology. Telkom University and BRIN are researching metaverse technology. Metaverse study is urgent because this technology will be widespread, like virtual student learning. Indonesia is ready for metaverse technology, say Bappenas and BRIN. Jokowi said a virtual world approach is needed to prevent falling behind (Burhan, 2022).

Regulations encourage metaverse development. Conventional and metaverse transactions are equal. Metaverse-only virtual property or goods are traded electronically. People need to understand that metaverse purchases are Non-Fungible Tokens. It shows NFT ownership proves land ownership. The metaverse uses NFT for art, music, and land. The question is whether Indonesian legislation allows NFT purchases and sales. All property-controlled rights are objects under Civil Code Article 499. Items might be tangible or intangible (Dewi & Sukihana, 2022; Hapsari, 2021). The research states that NFTs are intangible digital goods protected by copyright and encrypted on the blockchain, confirming their legitimacy. Article 1 number 4 PP No. 80 of 2019 defines smart contracts as electronic agreements. Smart contracts are blockchain-based computer-coded agreements that automatically execute and enforce their terms. Data authenticity is verified digitally and instantaneously for security. All metaverse transactions employ blockchain and smart contracts. The blockchain will record this, and the deal will be legal because the two parties consented under Civil Code Article 1320. Laws do not prohibit virtual or NFT items (KlikLegal.com, 2022).

Islamic law also supports this position; it is known that NFT buying and selling transactions on *the metaverse* have fulfilled the Shari'a based on the pillars of buying and selling (Wu, 2021). However, it must be noted that until now, the use of *cryptocurrency* as a legal payment method in Islam is still being debated. According to Pramana et al. (2014) and Afrizal & Marliyah (2018), The object must be generally accepted, the material used or printed as money must be durable, the quality must be uniform, and the quantity must meet community needs and not be easily counterfeited. MUI said cryptocurrencies are allowed if they are used as assets or investments, not payments. At the VII Indonesian Ulama Ijtima Forum, the Indonesian Ulema Council (MUI) forbade the use of cryptocurrencies as currency for buying and selling transactions due to Gharar (uncertainty) and Dharar (harming one party) (Fahri, 2023; Maksalmina, 2022).

However, several public sector factions oppose the government's metaverse development policy. Cybercrime and discriminatory national policies are emphasized. Electronic Transaction Law 8 of 2011, changed into Law 19 of 2016, controls cybercrime in articles 27–30 on criminal crimes. Article 30 paragraphs (1), (2), and (3) define hacking as (a) Deliberately

accessing other people's electronic systems by any means, (b) Intentionally and without authorization or unlawfully accessing a computer and electronic system to obtain Electronic Information and Electronic Documents, and (c) Breaching. Article 46 provides (a) for ITE Law article 30 violators. Paragraph 1: six years in prison and a six-million-rupiah fine (b). paragraph (2) carries a seven-year prison sentence and a seven-million-dollar fine. Paragraph (3) faces an eight-year prison sentence and an IDR 800,000,000.00 fine (Fauzan & Priowirjanto, 2023; Nyimasmukti, Wijayanti, & Juniarti, 2022). The main narratives and counter-narratives identified can be seen in the table 4.

**Table 4. Main Narratives and Counter-Narratives of the Metaverse in Public Services**

| <b>Main Narrative</b>  | <b>Counter Narrative</b>   | <b>Cause of Difference</b>  |
|--|--|---|
| Metaverse services are faster, cheaper, and more accessible.       | Optimization of digital infrastructure remains a higher priority and is still ongoing.                       | Gaps in public service capacity between urban and non-urban areas.          |
| Metaverse services promote civility, fairness, and prosperity.     | Users may struggle to separate reality from virtual worlds, prefer isolation, and create closed communities. | Human reliance on metaverse technology affects usage intensity.             |
| Metaverse public services should be automated and available 24/7.  | Large-scale automation needs advanced infrastructure and resource management, which are lacking.             | Development must align with infrastructure needs for public service.        |
| Metaverse management can curb corruption in governance.            | Corruption persists through personnel exploiting gaps in regulations.  | Effective prevention requires a human element, not just technology.         |
| Metaverse can aid in addressing poverty, crime, and health issues. | Effective use requires skilled human resources for monitoring and policy execution.                          | Metaverse effectiveness depends on integration with other strong resources. |

Source: Data Analysis, 2023

The table above describes and counters Indonesian public service metaverse installation. The table shows how the metaverse can improve public service accessibility, efficiency, and effectiveness. The table shows the pros and cons of metaverse integration with Indonesian public services. The optimistic view sees the metaverse as a revolutionary tool that improves accessibility, efficiency, and service quality. In contrast, a more cautious view highlights infrastructural deficiencies, resource constraints, and the risk of digital divisions. The former depicts a technologically empowered citizenry obtaining seamless public services, while the latter highlights the complex relationship between technology, policy, and socio-economic realities. The metaverse's potential must be maximized by addressing infrastructural gaps, ensuring fair access, and prioritizing digital literacy and creativity.

Previous talks raised major public service metaverse use concerns: (a). More robust policies and regulations must balance protection, security, guidance, and facilitation to meet digitalization's security and societal challenges. Society needs security for cybercrime and hazardous content. (b). Digital government plans with proactive and realistic infrastructure, people resources, and legislation are the government's challenge. Digital technology development and operation require skilled workers. Digital government development needs proactive, practical rules, and (c). Digitalization demands cross-sectoral education. Public education regarding the risks of digitalization is required. The proposed solution can be seen in the following table:

Table 5. Solutions Offered to the Metaverse Problems

| Root of Problem   | Solution   |
|---|--|
| Rising cybercrime and risks like data theft, manipulation, and social issues such as pornography and anarchy.                         | Implement balanced policies for protection, security, and facilitation.  |
| Poor infrastructure and low literacy hinder metaverse adoption, while high device costs slow ecosystem growth.                        | Develop a proactive digital government plan that improves infrastructure, human resources, and regulatory support. |
| Metaverse use may lead to isolation, childhood obesity, eye health problems, and psychological issues from distorted self-acceptance. | Enhance digital literacy and improve technology responsibly, targeting users across sectors.                       |

Source: Data Analysis, 2023

Digitalization theory says metaverse-based public service digitalization has pros and cons. Metaverse boosts productivity, accessibility, equity, and creativity. Metaverse harms security, society, digital inequality, and the environment. Legal reform, digital governance, literacy, and education are needed to offset digitalization's harmful effects. The following digitization projects try to reduce its negative impacts: Society needs security policies to stop cybercrime and dangerous content. The public needs help using digital technologies sensibly. People require digital literacy to understand and use technology. Cybercrime and dangerous content can be avoided with digital literacy. With sufficient infrastructure and facilities, people may safely and comfortably access information and digital technology (Prasetyo, 2022). Technology must be affordable and accessible to alleviate digital inequality. Digital equality measures must be realistic and efficient through cross-sector coordination, and competent and qualified human resources are needed to create and implement digital technology evenly. Awareness of digitalization's environmental impacts can encourage responsible technology use. The government may strengthen data privacy regulations and cyber security to address security and social issues. The digital disparity is reduced by government subsidies for digital devices and free internet in rural areas. Digitalization's environmental impact can be reduced by the government's energy- and resource-efficient technology development. These vast and sustainable measures must offset digitalization's harmful effects. Metaverse may increase Indonesia's efficiency and access to public services. However, security, digital inequity, and environmental impact must be addressed. Indonesia must quickly establish infrastructure, legislation, and digital literacy programs to use the metaverse while mitigating risks properly.

## E. CONCLUSION

Metaverse has the potential to transform the delivery of public services by increasing accessibility, efficiency, and efficacy. This potential represents a significant opportunity. For instance, virtual town halls can encourage increased citizen participation, and immersive training simulations can improve public safety initiatives' outcomes. However, to fully obtain these benefits, it is necessary to seriously consider several problems, including differences in infrastructure, the distribution of resources, and the possibility of privacy risks. Metaverse promises efficiency, access, and innovation and adds complexity. Security breaches, growing digital inequities, energy consumption, and environmental issues are significant challenges. A holistic approach is needed to solve these issues. This approach should involve robust policy frameworks, focused digital literacy, and equitable technology distribution. The most critical component in integrating metaverse into public services is a well-balanced plan that maximizes benefits and minimizes risks. To truly utilize the metaverse, strategy is essential. To do this, we must fix infrastructural gaps, judiciously distribute resources, and create an inclusive, safe, and sustainable digital economy. Governments can lead this technology frontier by mitigating

risks and seizing possibilities. Technological advancement, policy innovation, and social adaptability will shape the metaverse's adoption in public services.

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### **Contributorship**

Eko Budi Sulistio primarily prepared the manuscript and presented the data. Simon Sumanjoyo Hutagalung contributed to developing the narrative, performed editing, and translated the draft.

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