The Model of Influencing Factors on Metaverse Governance in Smart Cities (Qualitative Approach)

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Abstract
Purpose: The current research was conducted with the purpose of "presenting a model of factors affecting the metaverse governance of the smart city using thematic analysis technique. Design/methodology/approach: this research was applied in terms of purpose and in terms of the qualitative-quantitative method based on a thematic analysis approach and 15 qualified professors and experts who were aware of smart city metaverse governance were used in the form of interviews

Findings: In this study, the analysis of the collected qualitative data was done through open coding and axial coding. In the open coding stage, the researcher identified 32 concepts and expanded them according to their characteristics and dimensions. Out of the 32 extracted codes, 13 codes were repeated, and 19 codes were confirmed after sorting. Then, from the primary raw data, the preliminary categories related to the phenomenon under investigation by dividing the information into the formation categories of information about the phenomenon under study, asking questions about the data, comparing cases, events, and other states of phenomena for The similarities and differences were discussed and categorized into 4 categories: 1) Smart ICT, 2) Ethics, 3) External and internal cooperation and participation, and 4) Organizational processes

Implications: In line with the proposal for future research, researchers are advised to measure the causal, contextual, and interventional factors of smart governance using the meta-composite approach and database, or to analyze and evaluate its effect on variables with appropriate semantic affinity.

Keywords: Metaverse Governance, Smart Governance, Smart City

1.Introduction

In industrial literature, including IBM's idea of a smart city, cities are considered as a system of systems. This company defines the smart city as a city that uses technology to change and transform its main systems and optimize the return of very limited resources. However, the government literature emphasizes more on the administrative and financial aspects of the smart city and environmental goals such as the emission of greenhouse gases. In general, academic literature has a comprehensive and comprehensive approach covering a wide range of topics and is mainly focused on improvement in the three areas of governance, social development, and environment. From an industrial point of view, smart cities have emerged mainly due to the interaction between competition and sustainable urban development. In addition, productivity, and sustainable environment, and social development are the main goals of smart cities. Finally, government literature is mostly focused on international challenges including quality of life, economic growth, environment, energy, sustainability, safety, healthcare, and mobility.

A smart city is said to be a city that, based on the latest developed theories of urban management based on information and communication technology, has the following six main criteria:

- Smart governance
- Smart citizen
- Smart living environment and living space
- Smart Economy
- Smart Transportation
- Smart energy

Metaverse is a virtual world that, by combining the concepts of virtual reality and augmented reality, seeks to allow its users to do everything they do in the real world without having to be physically present in Metaverse. The metaverse can be introduced as a superior world in which the limitations of the physical world will disappear and perhaps humans can live in their ideal world. In this way, the term metaverse can be considered "superior world" or "superior to the world". Although we are still far from practical examples of Metaverse technology, this concept has been around for a long time and several decades.

Stories, computer games, and digital technologies have been mentioned. In this narrated book, people can continue their hard lives in the real world by living in the virtual and digital worlds. Looking at all these trends and finally changing the name of Facebook to Meta all indicate that there have been many programs for the metaverse category in the past (Hong et al., 2022). It represents the real parallel world in the virtual world, which is made of computer graphics, and users can access this world from all over the world through special headphones and glasses. Users in the metaverse find material and external manifestations in the form of configured digital bodies called avatars (Dioniso, 2013). Metaverse or meta world should be considered as a turning point of convergence between efforts made and completed in different fields such as computer, information science, artificial intelligence, graphics, social sciences, commerce, etc. (Hassanzadeh, 1401).

After the concept of the metaverse was defined, extensive efforts and research were made to realize the metaverse in reality. A metaverse research organization announced the metaverse roadmap in 2006. This model presented a concept of the metaverse and four types of the metaverse and pointed to thinking about the metaverse as a connection point or combination of real-world and virtual reality (Ga et al., 2021). Metaverse was defined as a "3D virtual reality" in which daily activities and economic life are performed with avatars representing the real selves of people, it seems that the real world has been combined with virtual space and reality has expanded into virtual space. can be In other

words, the avatar in the metaverse is identified with one's true self. Avatar works in social, economic, and cultural activities in the metaverse world. In addition, Li (2021), stated that the metaverse means a world in which virtual and reality interact, and social, economic, and cultural activities are carried out to create value, in addition, the metaverse can represent a world in which daily life and economic activities are carried out in an integrated manner. Gastels (2001) also called the contemporary era "information age" in which the main processes and functions in networks are growing. These networks organize a new social morphology (morphology) and the diffusion of network logic modifies production, cultural, and social processes as well as experience processes. Therefore, it is a system of interconnected elements that can be connected to other elements and create other networks and new systems in the world. It states that the importance of digital technologies is in providing the possibility to create and run communities. In developing societies, emotions play an important role: members of societies express themselves online through various means, not just writing. Voice smiles and graphic / video expressions help to communicate different emotions. Therefore, different digital technologies offer the possibility of sharing the emotional relationships of members. In the case of Metaverse technology, this possibility is created by text, sound, graphics, and sign language. This means that a member's personality can be expressed by the way they write, their comments in a discussion, customizing their avatar, etc.

A new world that allows everyone to communicate and gain diverse experiences regardless of the current internet limitations. In the virtual world of Metaverse, everything you want is available to you, you can create your favorite character in it and live in it just like real life. You can control everything in this world in

a completely decentralized manner without the authority and management of it being in the hands of a specific government institution (Mahmoudi and Sadeghi, 1401). In other words, Metaverse acts as a virtual network where users will be able to interact with each other and with other components of their surroundings. In the metaverse world, They engage in virtual role-playing. This virtual world integrates different aspects of social networks, video games, virtual reality technology, and finally the blockchain. For this reason, the metaverse can be attributed to the world that is created by virtual realities and augmented realities (Mahmoudi and Sadeghi, 1401).

Although a solution to the world's problems and challenges in various biological fields has not yet been found, people are looking to establish a base for life in another place such as Mars. In the meantime, people like Mark Zuckerberg have pointed to a different world than the one that exists proposed the concept of meta and metaverse, and sees the future in the metaverse. The metaverse is a term to describe a shared virtual space that may one day replace the Internet, where we may all live, work, play, and interact with each other through virtual reality and augmented reality devices.

Metaverse is becoming the mainstream in everyday life, and for this reason, reputable companies and brands in the world are looking to identify fields create value based on it, and try to find a better place in this ecosystem. The metaverse was previously in the gaming industry, but as of 2021, it is becoming a fully functional ecosystem where users can easily interact with other users and their environments. In this research, while introducing the concept of metaverse, its applications in smart cities and governance will be mentioned. and metaverse in the development of the smart city is identified and analyzed and future research. Therefore, what the researcher seeks to answer in this research; is that:

What are the most important indicators and important influencing variables in the governance of Metaverse smart cities?

2. The theoretical framework of the smart city

In 2019, Caraglio and Del Bo discussed their smart city theory based on the dimensions of urban innovation. Their theories were based on two dimensions. These dimensions include urban innovation and city policies. This theory proved that each of the components affects the smart city. This theory was presented in Italy.

In 2019, Harstad and Wetten discussed their smart city theory based on the dimensions of urban energy sustainability. Their theories were based on two dimensions. These dimensions include energy sustainability and urban initiatives. This theory proved that each of the components will be effective in the smart city. This theory is presented in Sweden.

In 2019, van den Bos and Kolk discussed their smart city theory based on the exploration dimensions of smart city approaches. Their theories were based on two dimensions. These dimensions include information and communication technology multinational companies. This theory proved that each of the components of the smart city will have tires. This theory was presented in the Netherlands.

In 2019, Brook et al. discussed their smart city theory based on lighting dimensions. Their theories were based on two dimensions. These dimensions include technology-based companies and separate businesses of reputable organizations. This theory proved that each of the components affected the smart city. This theory was presented in the Netherlands.

In 2019, Nilsanaeh discussed their smart city theory based on the dimensions of urban innovation. Their theories were based on four dimensions. These dimensions are technological, organizational, collaborative, and experiential. This theory proved that each of the components will

affect the smart city. This theory is presented in Norway.

In 2019, scientists discussed their smart city theory based on the dimensions of artificial intelligence. Their theories were based on three dimensions. These dimensions include the Internet of Things, big data, and artificial intelligence. This theory proved that each of the components will be useful for the smart city. This theory is presented in Australia.

In 2019, Al-Saidi et al. discussed their smart city theory based on the dimensions of city infrastructure. Their theories were based on one dimension. These dimensions are limited devices of Boltzmann company. This theory proved that each of the components will affect the smart city. This theory is presented in Australia.

In 2019, Desdemuster and colleagues discussed their smart city theory based on the dimensions of municipalities. Their theories were based on four dimensions. These dimensions include technological, social, comprehensive, and indirect. This theory proved that each of the components will be useful for the smart city. This theory was presented in Belgium.

In 2019, Ardito et al. discussed their smart city theory based on the dimensions of knowledge management. Their theories were based on one dimension. These dimensions include university. This theory proved that each of these components is effective in the smart city. This theory was presented in France.

In 2019, Mai discussed his smart city theory based on the dimensions of food systems. Their theories were based on two dimensions. These dimensions include smart city planning and food systems. This theory proved that each of the components will be effective in the smart city. This theory was presented in England.

In 2019, Smagilova et al. discussed their smart city theory based on the dimensions of information systems. Their theories were based on three dimensions. These dimensions include the Internet of Things,

cloud computing, and Bluetooth. This theory proved that each of the components will be useful for the smart city. This theory is presented in India.

In 2019, Roquio et al. discussed their smart city theory based on the dimensions of transportation tracking in smart cities. Their theories were based on 2 dimensions. These dimensions include transportation tracking and smart grids. Rokio and colleagues proved that smart city research is usually related to the stated components.

In 2019, Lam and Ma reviewed their smart city theory based on the dimensions of information insecurity in the smart city system and mitigation measures to resolve them. Their theories were based on 2 dimensions. These dimensions include system information insecurity lack of energy and economic reconstruction. Based on these dimensions, Lam and Ma argued that Shahrhoshand will have a more stable future by solving problems such as system information insecurity and lack of energy and economic reconstruction.

In 2019, Jhew et al. studied their smart city theory based on the dimensions of smart city flexibility. Their theories were based on 2 dimensions. These dimensions include flexibility and potential linkages. Flexibility and potential linkages can often help support and sustain a smart city. In 2019, Live et al. discussed their smart city theory based on the dimensions of data integrity checks in smart city applications. Their theories were based on 2 dimensions. These dimensions include data integration, applications, information technology, data integration, and data performance evaluation. Live et al.'s theory was able to prove that for smart city review, the required information related to data integrity, applications, information technology, data integration, and data performance evaluation must be accessible and fully trained by users.

In 2019, Wang et al. discussed their smart city theory based on the dimensions of industrial parks in smart cities. The theory of these researchers proved that the management of industrial parks and the development of industrial parks in these cities are among the concerns of policymakers.

In 2019, Jan et al. reviewed their smart city theory based on the dimensions of a cryptographic framework for software in a smart city. Their theories were based on 2 dimensions and proved that software encryption and security and computing costs can be used by researchers as dimensions that affect the smart city.

A study by Lauf et al. was conducted in 2020 under the title Security and the Smart City: A Systematic Review. The purpose of this research is to investigate how well these new interventions are compatible with the traditional functions of security interventions. Was. The results of this research showed that we suggest three clear categories for classifying security interventions in smart cities: those interventions that use new sensors but traditional triggers, those that seek to make old systems smarter, and those that introduce completely new functions.

In 2018, Rohlandt discussed his smart city theory based on the dimensions of the systematic literature review of smart city management. Their theories were based on 3 dimensions. These dimensions include consulting, smart networks, and digitization. This theory proved that each of the tested components had an impact on the smart city. This theory is presented in the United States.

In 2018, Anand and Navio discussed their smart city theory based on the governance and economic aspects of smart cities. Their theories were based on 4 dimensions. These dimensions include global market scale, smart city data, market structure, and local economy. This theory proved that each of the tested components had an impact on the smart city. This theory was presented in England.

In 2018, Kumar and colleagues discussed their smart city theory based on the

dimensions of moving towards a smart city. Their theories were based on 4 dimensions. These dimensions include planning, physical infrastructure, IT infrastructure, and smart solutions. This theory proved that each of the tested components was effective in the smart city. This theory is presented in New Delhi. In 2018, Palomo and Navio discussed their smart city theory based on the governance dimensions of smart city networks. Their theories were based on 3 dimensions. These dimensions include consulting, smart networks, and digitization. This theory proved that each of the tested components had an impact on the smart city. This theory was presented in Spain.

In 2018, Axelson and Grant discussed their smart city theory based on the dimensions of stakeholder participation and intelligent communication in the development of a smart city. Their theories were based on 2 dimensions. These dimensions include intelligent dimensions and stakeholders. This theory proved that each of the tested components was effective in the smart city. This theory is presented in Sweden.

In 2018, Silva et al. discussed their smart city theory based on the dimensions of architectural trends, components, and open challenges in smart cities. Their theories were based on 3 dimensions. These dimensions include consulting, smart networks, and digitization. This theory proved that each of the tested components had an impact on the smart city. This theory is presented in Korea.

In 2018, Arora discussed their smart city theory based on the dimensions of financial sector development and smart cities. Their theories were based on 2 dimensions. These dimensions include aspects of financing and digital city policies. This theory proved that each of the tested components was effective in the smart city. This theory has been presented in India.

In 2018, Vijitcanalar discussed his smart city theory based on the dimensions of smart city policy and the sustainability of cities. His theories were based on 2 dimensions. These dimensions include city intelligence and sustainable development. This theory proved that each of the examined components had an impact on the smart city. This theory is presented in Australia.

In 2018, Brunet al. discussed their smart city theory based on the dimensions of security and privacy challenges in smart cities. Their theories were based on 3 dimensions. These dimensions include volatile disturbances, expensive disturbances, and smart grid challenges. This theory proved that each of the tested components had an impact on the smart city. This theory is presented in the United Arab Emirates.

In 2017, Aina discussed its smart city theory based on the dimensions of achieving smart cities with smart support. Smart city theory This researcher showed that geographic information and communication technology along with intelligent support can usually be used as the approaches to be investigated for smart city.

In 2017, Grossi and Pianzi showed in their theory that ideas and values can be provable components for examining the smart city in management theories. In 2017, Kumitha and Kretizen argued in their theory that values, expectations, crises, and human capital and equipment can be grounds for the perception of a smart city.

In 2017, Fernses and Broders proved that economic sustainability, social sustainability, and environmental sustainability can influence the definition and formation of a smart city. These researchers proved that the improvement of each of these components can affect different levels of the smart city.

Lopes and Oliveria proved in 2017 that managing assets, investing in innovation and creativity, and promoting sustainable and comprehensive urban development can justify the infrastructure of a smart city. These dimensions have been proven in this study and are considered to be part of the

strengthening capabilities of the smart city. In 2017, Egawad concluded in his smart city theory that the new social weaknesses and intercultural education that arise after the smart city can affect the formation and structure of the smart city. Aguaded proved that the smart city can be evaluated based on the stated dimensions.

Niarozo colleagues (2017) showed in their smart city theory that creation, learning, and innovation can be dimensions of the formation and improvement of a smart city and have an effect on it. These researchers found that by making changes in the levels of these dimensions, the percentage of progress of the smart city can be changed, and by creating appropriate strategies, they plan to change the level of development of the smart city.

In 2017, Erimia et al discussed their smart city theory based on the dimensions of the smart city concept in the 21st century. Their theories were based on 2 dimensions. These dimensions include concepts and practical terms. This theory proved that each of the tested components had an impact on the smart city. This theory was presented in Romania.

Kayson et al in 2017 discussed their smart city theory based on the dimensions of the critical aspects of the smart city. Their theories were based on 2 dimensions. These dimensions include reducing energy consumption and increasing energy efficiency. Kayson and colleagues proved that the smart city usually needs these components to survive.

In 2017, Kickerley et al. discussed their smart city theory based on the dimensions of smart city programs. Their theories were based on 2 dimensions. These dimensions include geographic expansion and functional expansion. They argued that the smart city can change the composition of a city geographically and functionally.

In 2017, Sarma and Soni reviewed their smart city theory based on the dimensions of smart city entrepreneurship ecosystems. Their theories were based on 2 dimensions.

These dimensions include social entrepreneurship and digital entrepreneurship. Based on these dimensions, Sarma and Soni argued that the smart city usually causes many developments and developments in social entrepreneurship and digital entrepreneurship.

In 2017, Vidyasova et al. reviewed their smart city theory based on the dimensions of international experts' assessment of the smart city landscape. Their theories were based on 5 dimensions. These dimensions include the level of resource management, e-government infrastructure, complex social systems, education, and safety indicators. They proved that the existence of these components is the difference between a smart city and an ordinary city.

In 2017, Aguilera et al. studied their self-compassion theory based on dimensions of citizen services for smart cities. Their theories were based on 4 dimensions. These dimensions include open government data, sensor networks deployed in cities, active contributions to city knowledge with smartphones, and implemented programs that usually can support this issue to build a smart city.

In 2017, Garg et al discussed their smart city theory based on the dimensions of the role of e-learning in building smart cities. Their theories were based on 2 dimensions. These dimensions include e-learning and wireless use. Garg et al proved the theory that in electronic education, the use of wireless usually affects the amount and intensity of education in the smart city.

In 2017, Khan et al. discussed their smart city theory based on the dimensions of providing safe services in a smart city. Their theories were based on 3 dimensions. These dimensions include secure communication protocols, authorization protocols, and secure communication protocols for obtaining information and providing services. This theory proved that by creating these components, it can usually be expected that all aspects of safety will be

observed in the smart city. In 2017, Wisley et al. discussed their smart city theory based on the reference dimensions of smart city management. Their theories were based on 2 dimensions. Wisley et al.'s theory showed that city management skills and detailed planning are appropriate approaches to creating excellent management in a smart city.

In 2017, Anand et al. discussed their smart city theory based on the dimensions of evaluating sustainable indicators in smart cities. Their theories were based on two dimensions energy resource management and economic development policy design. These researchers showed that in the sustainability of the smart city, it is necessary to pay attention to the management of energy resources and the design of economic development policies.

Thompson in 2017 discussed their smart city theory based on the dimensions of understanding the concepts of developing smart city initiatives. Their theories were based on 2 dimensions. These dimensions include technological solutions and solving urban management challenges. Thompson's theory was able to prove that to investigate the smart city, it is necessary to pay attention to technological solutions and solve the challenges of urban management.

Table (1) Smart city theories

Theory	Theorist
Caragliu and Del Bo in 2019	They discussed their smart city theory based on the dimensions of urban innovation. Their theories were based on two dimensions. These dimensions include urban innovation and city policies. This theory proved that each component affects the smart city. This theory is presented in Italy.
Harvestad and Wetten in 2019	They discussed their smart city theory based on the dimensions of urban energy sustainability. Their theories were based on two dimensions. These dimensions include energy sustainability and Urban Initiatives. This theory proved that each of the components will affect the smart city. This theory is presented in Sweden.
Fan den Bose and Kolk in 2019	They discussed their smart city theory based on the dimensions of exploration of smart city approaches. Their theories were based on two dimensions. These dimensions include multinational ICT companies. This theory proved that each of the components of the smart city will have a tire. This theory is presented in the Netherlands.
Brooke et al. in 2019	They discussed their smart city theory based on lighting dimensions. Their theories were based on two dimensions. These dimensions include technology-based companies and separate businesses of reputable organizations. This theory proved that each of the components influenced the smart city. This theory is presented in the Netherlands
Nielsenah in 2019	They discussed their smart city theory based on the dimensions of the world's urban innovation. Their theories were based on four dimensions. These dimensions include technological, organizational, collaborative, and experimental. This theory proved that each of the components will affect the smart city. This theory is presented in Norway.
Alem and Dani in 2019	They discussed their smart city theory based on the dimensions of artificial intelligence. Their theories were based on three dimensions. These dimensions include the Internet of Things, Big Data, and Artificial Intelligence. This theory proved that each of the components will be useful in the smart city. This theory is presented in Australia.
Elsaidi et al. in 2019	They discussed their smart city theory based on the dimensions of the city's infrastructure. Their ideas were based on one dimension. These dimensions include Boltzmann limited devices. This theory proved that each component will affect the smart city. This theory is presented in Australia.

Theory	Theorist
Desdemuster et al. in 2019	They discussed their smart city theory based on the dimensions of municipalities. Their theories were based on four dimensions. These dimensions include technological, social, holistic, and indirect. This theory proved that each of the components will be useful in the smart city. This theory is presented in Belgium.
Arditovo colleagues in 2019	They discussed their smart city theory based on the dimensions of knowledge management. Their ideas were based on one dimension. These dimensions include the University. This theory proved that each of these components affects the smart city. This theory is presented in France.
May in 2019	They discussed their smart city theory based on the dimensions of food systems. Their theories were based on two dimensions. These dimensions include smart city planning and food systems. This theory proved that each of the components will affect the smart city. This theory is presented in the United Kingdom.
Smagilova et al. in 2019	They discussed their smart city theory based on the dimensions of Information Systems. Their theories were based on three dimensions. These dimensions include the Internet of Things, cloud computing, and Bluetooth. This theory proved that each of the components will be useful in the smart city. This theory is presented in India.
Rocchio et al. in 2019	They discussed their smart city theory based on the dimensions of transportation tracking in smart cities. Their theories were based on 2 dimensions. These dimensions include transport tracking and smart grids. Rocchio's colleagues have proven that smart city surveys are usually related to the components expressed.
Lam & Ma in 2019	They looked at their smart city theory based on the dimensions of information insecurity in the smart city system and the mitigation measures to address them. Their theories were based on 2 dimensions. These dimensions include system information insecurity energy shortages and economic restructuring. Based on these dimensions, Lam & Ma argued that the city will have a more stable future by solving problems such as system information insecurity energy shortages, and economic reconstruction.
Zhou et al. in 2019	They studied their smart city theory based on the dimensions of smart city flexibility. Their theories were based on 2 dimensions. These dimensions include flexibility and potential bonds. Flexibility and potential links can usually help support and sustain a smart city.
Live et al. in 2019	They discussed their smart city theory based on the dimensions of data integrity in smart city applications. Their theories were based on 2 dimensions. These dimensions include Data Integrity, Applications, Information Technology, Data Integration, and data performance evaluation. Live theory and colleagues were able to prove that for smart city surveys, the information needed in relation to Data Integrity, Applications, Information Technology, Data Integration and data performance evaluation is required to be accessible and fully trained by users.
Wongo associates in 2019	They discussed their smart city theory based on the dimensions of the study of industrial parks in smart cities. The researchers ' theory proved that the management of industrial parks and the development of industrial parks in these cities are among the concerns of policymakers.
John et al. in 2019	They looked at their smart city theory based on the dimensions of a cryptographic framework for software in smart cities. Their theories were based on two dimensions, proving that software encryption and security and computing costs could be used as dimensions affecting smart cities by researchers.
Lauf et al. in 2020	We suggest three clear categories for classifying security interventions in smart cities: those that use new sensors but traditional stimuli, those that seek to make older systems intelligent, and those that introduce completely new functions.

Theory	Theorist
Rohlandt in 2018	He discussed his smart city theory based on the dimensions of the systematic literary review of the smart city administration. Their theories were based on 3 dimensions. These dimensions include consulting, smart networking and digitization. This theory proved that each of the components tested had an impact on smart cities. This theory is presented in the United States.
Anand and Navio in 2018	They discussed their smart city theory based on the dimensions of governance and the economy of smart cities. Their theories were based on 4 dimensions. These dimensions include global market scale, smart city data, market structure and local economy. This theory proved that each of the components tested had an impact on smart cities. This theory is presented in the United Kingdom.
Kumar et al. in 2018	They discussed their smart city theory based on the dimensions of moving towards a smart city. Their theories were based on 4 dimensions. These dimensions include planning, physical infrastructure, IT infrastructure and clever solutions. This theory proved that each of the components tested was effective on smart cities. This theory is presented in New Delhi.
Palomo and Navio in 2018	They discussed their smart city theory based on the dimensions of smart city network governments. Their theories were based on 3 dimensions. These dimensions include consulting, smart networking and digitization. This theory proved that each of the components tested had an impact on smart cities. This theory is presented in Spain.
Axelson and Grant in 2018	They discussed their smart city theory based on the dimensions of shareholder contributions and Intelligent Communication in smart city development. Their theories were based on 2 dimensions. These dimensions include smart dimensions, stakeholders. This theory proved that each of the components tested was effective on smart cities. This theory is presented in Sweden.
Silva et al. in 2018	They discussed their smart city theory based on the dimensions of architectural trends, components and open challenges in smart cities. Their theories were based on 3 dimensions. These dimensions include consulting, smart networking and digitization. This theory proved that each of the components tested had an impact on smart cities. This theory is presented in Korea.
Aurora in 2018	They discussed their smart city theory based on the dimensions of financial sector development and smart cities. Their theories were based on 2 dimensions. These dimensions include aspects of financing and digital municipal policies. This theory proved that each of the components tested was effective on smart cities. This theory is presented in India.
Vijitkanlar in 2018	He discussed his smart city theory based on the dimensions of smart city policy and the sustainability of cities. His theories were based on 2 dimensions. These dimensions include city intelligence and sustainable development. This theory proved that each of the components examined had an impact on smart cities. This theory is presented in Australia.
Brun et al. in 2018	They discussed their smart city theory based on the dimensions of security and private challenges in smart cities. Their theories were based on 3 dimensions. These dimensions include unstable disturbances, expensive disturbances, challenges of smart networks. This theory proved that each of the components tested had an impact on smart cities. This theory is presented in the United Arab Emirates.
Aina in 2017	He discussed his smart city theory based on the dimensions of achieving smart cities with Smart support. The researcher's smart city theory found that geographic information and communication technology alongside smart support can usually be used as investigated approaches for smart cities.
Grossi and pianzi in 2017	In their theory, they showed that ideas and values can be provable components for the study of smart cities in management theories.
Comets and curtiusen in 2017	In their theory, they argued that values, expectations, crises and human capital and equipment can be grounds for perceiving a smart city.

Theory	Theorist
Furness and Broders in 2017	They've proven that economic sustainability, social sustainability and environmental sustainability can affect the definition and formation of smart cities. These researchers have proven that improving each of these components can affect different levels of smart cities.
Lopes and Oliveria in 2017	They've proven that asset management, investing in innovation and creativity, and promoting sustainable and comprehensive urban development can justify the infrastructure of a smart city. These dimensions have been proven in this study and are part of the capabilities of the smart city booster.
Aguade in 2017	In his theory of smart cities, he concluded that new social weaknesses and intercultural education that arise after smart cities can affect the formation and structure of smart cities. Aguad proved that smart cities can be examined based on the dimensions described.
Nyarozo Associates (2017)	Their smart city theory showed that creation, learning and innovation can be and influence the dimensions of the formation and promotion of smart cities. The researchers found that by making changes to the levels of these dimensions, they could change the percentage of Smart City progress and plan to change the level of smart city development by creating appropriate strategies.
Eremia et al. (2017)	They discussed their smart city theory based on the dimensions of the smart city concept in the 21st century. Their theories were based on 2 dimensions. These dimensions include practical concepts and terminology. This theory proved that each of the components tested had an impact on smart cities. This theory is presented in Romania.
Kyson et al. in 2017	They discussed their smart city theory based on the dimensions of critical aspects of smart cities. Their theories were based on 2 dimensions. These dimensions include reducing energy consumption and increasing energy efficiency. Kyson and colleagues have proven that smart cities usually need these components to survive.
Kickerley et al. in 2017	They discussed their smart city theory based on the dimensions of smart city programs. Their theories were based on 2 dimensions. These dimensions include geographic expansion and functional expansion. Their argument was that smart cities can geographically and functionally change the composition of a city.
Serma and Soni in 2017.	They looked at their smart city theory based on the dimensions of smart city entrepreneurial ecosystems. Their theories were based on 2 dimensions. These dimensions include social entrepreneurship and digital entrepreneurship. Based on these dimensions of cold and Sony argued that smart cities usually cause a lot of development and transformation in social entrepreneurship and digital entrepreneurship.
Vidyasova et al. in 2017	They looked at their smart city theory based on the dimensions of international experts ' assessment of the smart city landscape. Their theories were based on 5 dimensions. These dimensions include the level of resource management, e-government infrastructure, complex social systems, education and safety indicators. They've proven that these components are the distinction between smart cities and ordinary cities.
Aguilera et al. in 2017	They studied their self-immolation theory based on the dimensions of citizenship services for smart cities. Their theories were based on 4 dimensions. These dimensions include open government data, sensor networks based in cities, active contributions to city knowledge with smartphones, and programs implemented usually have the ability to support the issue of building a smart city.
Garg et al. in 2017	They discussed their smart city theory based on the dimensions of the role of e-learning in building smart cities. Their theories were based on 2 dimensions. These dimensions include e-learning, wireless usage. Garg et al. in the community

Theory	Theorist
	surveyed in Delhi proved the theory that e-learning, wireless use usually affects the amount and intensity of education in smart cities.
Khan et al. in 2017	They discussed their smart city theory based on the dimensions of providing secure services in smart cities. Their theories were based on 3 dimensions. These dimensions include secure communication protocols, licensing protocols, secure communication protocols for information acquisition and service delivery. This theory proved that by creating these components, it is usually expected that all safety dimensions in smart cities can be observed.
Wesley et al. in 2017	They discussed their smart city theory based on the dimensions of the smart city management reference. Their theories were based on 2 dimensions. Wesley's theory and colleagues showed that city management skills and careful planning are the right approaches to creating great management in smart cities.
Anand et al. in 2017	They discussed their smart city theory based on the dimensions of evaluating sustainable indicators in smart cities. Their theories were based on 2 dimensions of energy resource management and the design of economic development policies. The researchers showed that in the sustainability of smart cities, attention is also needed to manage energy resources and design economic development policies.
Thompson in 2017	They discussed their smart city theory based on the dimensions of understanding the concepts of developing smart city initiatives. Their theories were based on 2 dimensions. These dimensions include technological solutions and solving urban management challenges. Thompson's theory proved that smart cities need to be considered for technological solutions and urban management challenges.

3. Research Methodology

Research Design: The current study is focused on the views of experts in the field of smart city metaverse governance and what they have gained over the years. This research has examined the most important indicators affecting the metaverse governance of the smart city to arrive at a model. In this research, the researcher is aware of the fact that the indicators affecting the metaverse governance of the smart city were the result of perceptions and interpretations of the understanding of governance activists regarding what defines the indicators of the metaverse governance of the smart city.

Population and statistical sample: All professors and experts are qualified and are fully familiar with the field of governance and their opinions are useful in collecting and compiling factors. These people will be selected from members with active experience in governance. Research steps: In the first step, which constitutes the qualitative part, the necessary literature was comprehensively defined through official sources for preparing the framework of the research plan. At the beginning of this stage, the protocol for conducting research interviews with the participants was set. After developing the protocol, research interviews were conducted with the participants and these interviews were continued until theoretical saturation was reached, and after stopping the data collection, codes and initial concepts were extracted. In the following, this conceptual framework was returned to the participants and their corrective comments were received. Meanwhile, the extracted codes were coded. After finalization, it was measured in the form of a content validity index (CVI) and relative validity coefficient (CVR), and the research was finally completed by writing a research report and conclusion. Data collection methods and tools: in-depth interviews with experts, use of all specialized books, scientific research journals, reliable domestic and international scientific sites related to the research topic,

and internet articles and interviews with experts, in general, the roadmap for conducting research presently is based on the following table:

How to conduct the interview: In the present study, the interview was used as a tool to collect the required information in the qualitative part to conceptualize and formulate a conceptual framework in the field of governance. These interviews were conducted based on the main research question about the research subject by the researcher and based on the feedback received during the data collection and analysis process.

First, it started with a demographic study in the framework of the intended goals in the research and identification of experts in the field in the field of governance, selection questions, and open-ended interview questions, and then specialized questions were asked. Interview protocol: Using the interview method in research requires special procedures. Based on Cavalli's model (1996), the process of conducting interviews in the current research was carried out in seven stages determining the topic, designing interview questions, interview situation, implementation, analysis, verification, and reporting.

Interview questions: Considering the considerations and opinions of the experts, the question has been selected for the final interview, which includes issues and problems and presents the opinions of each of the interviewees. The interview questions are given in the attachment.

Note-taking: Digital tools were used to conduct interviews and all interviews were recorded by a digital recording device. During the interviews, the interviewees were asked to provide examples or examples of objective examples and experiences gained to describe the views raised by them or to express their reasons to justify their instrumental views. At the end of the interview, some open questions were asked to summarize the views and present some things that seemed important from the point of view of the interviewee. The recorded files were implemented after conducting the interviews. Before conducting the next interview, the initial coding and analysis of each interview were done. The duration of the interview varied from 35 to 60 minutes. At the same time as interviewing with the researcher, key and important points were noted.

Validity of the interview: Validity should be done in different stages of the qualitative method. At first, the research topic was approved by several experienced professors. At the stage of compiling the interview questions, these questions were approved by the professors of Metaverse governance, which averaged more than 80% of the questions of the final protocol after several repetitions (back and forth) according to the number of final approved questions. It has been approved by these experts and since it is above 70%, the interview protocol has high validity. The results of this investigation are shown in the following table:

Calculating the validity of the interview: The summary and key points of the interviews conducted with experts are given in the table below, where p means the interviewee.

Table (2) calculation of the validity of the interview

Expert agreement percentage	Number of agreements	Experts
0.37	7	1
0.47	9	2
0.63	12	3
0.74	14	4
0.37	7	5
0.42	8	6
0.26	5	7
0.47	9	8
0.53	10	9
0.58	11	10
0.74	14	11
0.79	15	12
0.53	10	13
0.79	15	14
0.74	14	15

Table (3-3) interviews with experts and initial codes

Source	Sub-categories
P1	Use of new communication channels for citizens
	Rationalism
	Being citizen-centric.
P2	The ability of government agencies to interact online with people in providing services and in performing their predetermined tasks
	Electronic participation
P3	Openness and decision making
	Digital systems of governance
P4	Government and electronic governance
	General guidance
P5	Cooperation among the departments
	Helping to promote economic growth
P6	Coordinate communication in order to achieve collective goals through collaboration
	Intelligence based on information
	Coordinate communication in order to achieve collective goals through collaboration
P7	The need to develop intelligent governance systems
	The need for intelligent management
	The need for intelligent interaction
P8	The need for smart infrastructure
	The need for smart security
	Agility
P9	Interactivity
	Accountability
P10	Transparency
P11	Smart services
P12	Public participation
P13	E-government
	Open government
	Attention to citizenship rights
P14	Democracy and populism
	Transparency
P15	Smart infrastructure
	Cooperation

Table 3-4 sorting of articles

	Sub-categories
A	Use of new communication channels for citizens
B	Rationalism
C	Being citizen-centric.
A	The ability of government agencies to interact online with people in providing services and in performing their predetermined tasks
A	Electronic participation
B	Openness and decision making
A	Government and electronic governance
C	Cooperation among the departments
D	The need for smart security
D	The need for intelligent interaction
C	Helping to promote economic growth

	Sub-categories
C	**Coordinate communication in order to achieve internal goals of the organization through cooperation**
A	**Intelligence based on information**
C	**Coordinate communications to achieve external goals through cooperation**
D	**The need to develop intelligent governance systems**
D	**The need for intelligent management**
D	**Smart infrastructure**
B	**General Guidance**
D	**Agility**

Table (3-5) research-oriented articles and codes

Sub-categories	Main Category
Use of new communication channels for citizens	**Smart ICT**
Government and electronic governance	
Intelligence based on information	
The ability of government agencies to interact online with people in providing services and performing their predetermined tasks	
Electronic participation	
Openness and decision making	**Ethicism**
Rationalism	
General guidance	
Cooperation among the departments	**Foreign and domestic cooperation and partnerships**
Helping to promote economic growth	
Coordinate communication to achieve collective goals through collaboration	
Being citizen-centric.	
Coordinate communication to achieve collective goals through collaboration	
The need to develop intelligent governance systems	**Organizational processes**
The need for intelligent management	
The need for intelligent interaction	
The need for smart infrastructure	
The need for smart security	
Agility	

4. Result and Discussion

This section interprets the findings of the research based on data collected from statistical analyses. A key question addressed is: What are the most significant indicators and variables influencing the governance of a metaversal smart city?

As highlighted in previous sections, the qualitative results were derived from in-depth interviews with 15 experts, complemented by note-taking that employed thematic analysis. Through this process, 19 important codes were identified and subsequently categorized into four main themes. The first theme, Smart ICT, encompasses the utilization of new communication channels, electronic governance, and information-driven smart solutions. This theme emphasizes the critical role of information and communication technology in enhancing interactions between citizens and governmental bodies. The second theme, Ethics, focuses on the foundational values and principles that guide governance processes within a smart city framework. It underscores the necessity for transparency, accountability, and inclusiveness in decision-making to foster public trust and engagement. The third theme,

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Sustainability, addresses the importance of integrating environmental and social considerations into urban planning and governance. This includes strategies for resource management, environmental protection, and promoting social equity within the community. Finally, the fourth theme, Citizen Engagement, highlights the need for active participation from residents in the governance process. This involves leveraging digital platforms to facilitate dialogue, gather feedback, and encourage collaborative decision-making, thus creating a sense of ownership and responsibility among citizens. In summary, the research underscores that effective governance in a metaversal smart city hinges on the interplay of technology, ethical standards, sustainability practices, and active citizen participation. By addressing these key areas, urban planners and policymakers can create a resilient and responsive governance model that meets the needs of a rapidly evolving urban landscape.

Regarding the commonalities and differences of this research with other studies, as cited by Hosseini (2022), it should be noted that the results of this research are in line with the study by Shul and Shul (2014); according to these researchers, smart interaction, smart management, smart infrastructure, and smart security are involved in transforming e-government into open government and smart governance. Additionally, Hassan et al. (2014), similar to this research, introduce rationality, ethics, and smart interaction as principles of smart governance.

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