



## OPINIONS OF SCHOOL ADMINISTRATORS ON METAVERSE AND WEB 3.0 CONCEPT

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### Abstract

*In recent years, the pace of change, particularly in technology, has been astonishingly rapid. The social structure created by technological changes is also impacting the field of education, and the roles of schools, teachers, and school administrators are becoming a subject of renewed scrutiny. How to adapt each new technology to education is a crucial issue for educators to examine. As developing technology integrates concepts like the Metaverse and WEB 3.0 into our lives, every educator must understand how to use these technologies in education. Therefore, it is crucial for school administrators to have sufficient knowledge of these concepts. The aim of this study is to examine the views of school administrators on the concepts of metaverse and WEB 3.0. The study was conducted with the participation of 47 school administrators working in Isparta province. Data were obtained through a semi-structured online form as an interview form. Content analysis technique was used in the data analysis process. According to the research findings, it was determined that the vast majority of school administrators had heard of the concept of the metaverse before, but had not heard of the concepts of VR, MR and AR related to the metaverse world (beyond the universe). More than half of the school administrators participating in the study stated that they had heard of the concepts of avatar and metahuman before. It was determined that more than half of the participating school administrators did not have information about the concept of NFT and innovative business. As a result of the research, it was determined that more than half of the participant school administrators had knowledge about the concept of WEB 3.0. In addition, when the participant school administrators were asked about their thoughts on the metaverse, it was seen that their thoughts were more positive and they were able to define this concept.*

**Keywords:** Metaverse, WEB 3.0, School administrators, NFT, Innovative business.

### Okul Yöneticilerinin Metaverse ve WEB 3.0 Kavramı Hakkındaki Görüşleri

#### Öz

*Son yıllarda özellikle teknoloji alanındaki değişimin hızı şaşırtıcı bir şekilde artmaktadır. Teknolojik değişimlerin ortaya çıkardığı toplumsal yapı, eğitim alanını da etkilemekte, okulların, öğretmenlerin ve okul yöneticilerinin rolleri yeniden incelenen bir konu haline gelmektedir. Gelişen her yeni teknolojinin eğitime nasıl uyarlanacağı, eğitimciler tarafından incelenmesi gereken önemli bir konudur. Gelişen teknoloji Metaverse ve WEB 3.0 gibi kavramları hayatımıza dâhil ederken bu teknolojilerin eğitimde nasıl kullanılacağı her eğitimci tarafından bilinmelidir. Dolayısıyla okul yöneticilerinin de bu kavramlara ilişkin bilgilerinin yeterli düzeyde olması önemlidir. Bu nedenle çalışmanın amacı araştırmaya katılan okul yöneticilerinin metaverse ve WEB 3.0 kavramlarına yönelik görüşlerini incelemektir. Çalışma Isparta ilinde görevli 47 okul yöneticisinin katılımıyla yapılmıştır. Görüşme formu olarak yarı yapılandırılmış çevrimiçi bir form aracılığıyla veriler elde edilmiştir. Verilerin analiz sürecinde içerik analiz tekniğinden yararlanılmıştır. Araştırma sonuçlarına göre okul yöneticilerinin büyük bir çoğunluğunun metaverse kavramını daha önce duydukları, bununla birlikte metaverse dünyası (evren ötesi) ile ilgili olan VR, MR ve AR kavramlarını duymadıkları bulgusuna ulaşılmıştır. Araştırmaya katılan okul yöneticilerinin yarıdan fazlasının avatar ve metahuman kavramlarını daha önce duyduklarını ifade etmiştir. Katılımcı okul yöneticilerinin yarisından fazlasının NFT ve inovatif işletme kavramı hakkında bilgi sahibi olmadığı tespit edilmiştir. Katılımcı okul yöneticilerinin yarisından fazlasının WEB 3.0 kavramı hakkında bilgi sahibi olduğu araştırma sonucunda tespit edilmiştir. Ayrıca katılımcı okul yöneticileri metaverse hakkındaki düşünceleri sorulduğunda düşüncelerinin daha olumlu olduğu ve bu kavrama ilişkin tanımlama yapabildiği görülmüştür.*

**Anahtar Sözcükler:** Metaverse, WEB 3.0, Okul yöneticileri, NFT, İnovatif işletme.

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## 1. Introduction

Advances in information and communication technologies have accelerated with innovations in technology. There are reflections of these advances in all areas of life. From art to education, from science to shopping, from business life to health and many other areas, reflections of this are visible. In the transition from physical and social space to virtual space, social norms have had to adapt to this situation. Technological advances aimed at facilitating life and meeting basic needs have attributed considerable meanings to all WEB 3.0 components, from the construction of the Internet to virtual reality, from metaverse to mixed reality, from augmented reality to physical reality.

With the widespread use of the Internet in the 1990s, social networks, virtual environments, video conferences and other cyber spaces have emerged. Although this situation is particularly disconnected and intermittent, it shows the important processes of transformation in the digital world (Lee et al., 2021). Day by day, advances in information and communication technologies increase the time spent in virtual environments. Especially during the Covid-19 pandemic, the digitalisation process has shown significant development (Gaubert, 2021; Jung et al., 2021; Kang, 2021; Lee, 2021; Oh, 2021; Seok, 2021; Thomason, 2021)

In this process, supporting both initiatives and businesses with some investments has been a significant advantage for the process (Jeon et al., 2021). In this process, the concept of metaverse has raised awareness by digital users all over the world. On 28 October 2021, Mark Zuckerberg's use of the concept of 'Meta' in the construction of social platforms and his investment of 10 Billion Dollars in this process has been an indicator of how important this process is (Heath, 2021). Metaverse offers people a multi-dimensional environment fiction with the virtual environment characters it creates (Zhang et al., 2022, p. 1). The concepts used in the Metaverse world can be expressed as virtual reality, mixed reality, augmented reality and extended reality. Virtual reality is referred to as VR, mixed reality is referred to as MR, augmented reality is referred to as AR and extended reality is referred to as XR.

The connection between metaverse and WEB 3.0, which gives people different perspectives in today's world where information and communication technologies are frequently advancing, shows that these advances are also experienced in education. These two concepts, which enable a parallel process regarding 21st century skills, are accepted as important concepts that should be taken into consideration in the education system. Web 3.0 provides an important and dynamic infrastructure (decentralisation, ownership) for the Metaverse. The evolution of Web 3.0 will bring enhanced capabilities for individuals to use and create content and will provide businesses with significant and numerous opportunities to grow their operations and increase their efficiency (Yurdabak & Deniz, 2023). The emergence of new technologies and technological concepts such as ubiquitous connectivity and smart applications (e.g., machine learning and autonomous agents) will also bring additional interactive features that form the basis of the Web 4.0 concept (Riaz et al., 2022). The fundamental task related to all these innovations lies within the education system. With Metaverse applications and WEB 3.0, education acquires different and modern qualities, allowing education stakeholders to gain gains from this process. Technology- supported education and interactive education model has spread further through advances in information and communication technologies (Alkayış, 2021). The interests and needs of each learner differ day by day. In the execution of this process, the integration and dissemination of developments in information and communication technologies into the education system is directly related to the awareness and qualifications of administrators and teachers working in the education system. For this purpose, the aim of the research is to reveal the views of school administrators on the concepts of metaverse and WEB 3.0.

### 1.1. Literature

In recent years, as metaverse applications have become more widespread, research has been conducted both domestically and internationally on metaverse applications in the field of education. Kartal and Arslan (2024), aiming to reveal prospective teachers' views on metaverse technology, conducted a study with 70 teacher candidates in their second and third years at a university's primary education department. They found that teacher candidates did not have in-depth knowledge about the concept of the metaverse and that their perceptions of the metaverse were shaped by social media rather than a full understanding of the relationship between education and the metaverse. Based on these findings, the study suggested that teacher candidates' perceptions and experiences regarding the metaverse and its use in education should be developed. Işık and Köse (2024); In their study aimed at revealing the views of science teachers on the use of the metaverse, augmented reality, and artificial intelligence applications in education, they determined that teachers have limited knowledge and application skills regarding the metaverse, augmented reality, and artificial intelligence applications as a result of semi-structured interviews conducted with 25 science teachers. Teachers participating in the research stated that hardware and software deficiencies that may occur while concretising abstract concepts for augmented reality applications reduce their usability. Metaverse applications, on the other hand, are an unfamiliar field for teachers, who stated that metaverse environments can provide enjoyable and lasting learning environments but cannot replace traditional teaching methods. Finally, the participating teachers stated that artificial intelligence applications facilitate work and provide quick access to information, but that this could lead to students becoming lazy. Ağgöl et al. (2023), in their study conducted to determine the views of 60 teacher candidates studying in different departments of universities on the concepts of Web 3.0 and the metaverse, found that teacher candidates generally had no idea about the concept of the metaverse, and those who were aware of it had only a very superficial level of knowledge. Prospective teachers associated metaverse technology with concepts such as three-dimensional environments, the internet, virtual environments, virtual profiles, and life integrated with new technology. While some prospective teachers argued that metaverse technology was entirely imaginary, others expressed the view that it could be beneficial for educational life. The study recommends increasing teacher candidates' awareness of metaverse technology to keep pace with the times and ensuring they actively use this technology in their real lives. In their research conducted with 42 classroom teachers working in state schools, Kaya and Şan (2024) sought to reveal the cognitive structures of teachers regarding the concept of the metaverse; they stated that teachers perceive metaverse environments as a transformed version of the internet, somewhere between the virtual world and the real world. However, the participants in the study stated that metaverse technology, with its artificial intelligence, augmented reality, and virtual reality applications, enables the transcendence of the boundaries of the physical world and the creation of functional and interactive educational processes. Potential dangers arising from metaverse environments, such as data privacy and the weakening of social relationships, were also put forward. In their research, Gün and Öz (2024) revealed the perceptions of teacher candidates studying Turkish language teaching in their 3rd and 4th years regarding the concept of the metaverse. They found that approximately half of the 50 teacher candidates were unaware of this concept, while more than half stated that they did not have the level of knowledge required to explain the terms augmented reality, virtual reality, mixed reality, avatar, metahuman, and NFT. However, since teacher candidates have a positive attitude towards learning metaverse technology, their knowledge level can be increased with the necessary training. Koca (2024), who aimed to reveal the attitudes of science teacher candidates towards the use of metaverse applications in the laboratory environment in his master's thesis, mentioned that while some teacher candidates had no idea about metaverse technology, others stated that the use of this technology in the laboratory had advantages such as making abstract

concepts concrete, enabling experiments to be carried out safely, overcoming physical limitations, and providing meaningful and enjoyable learning.

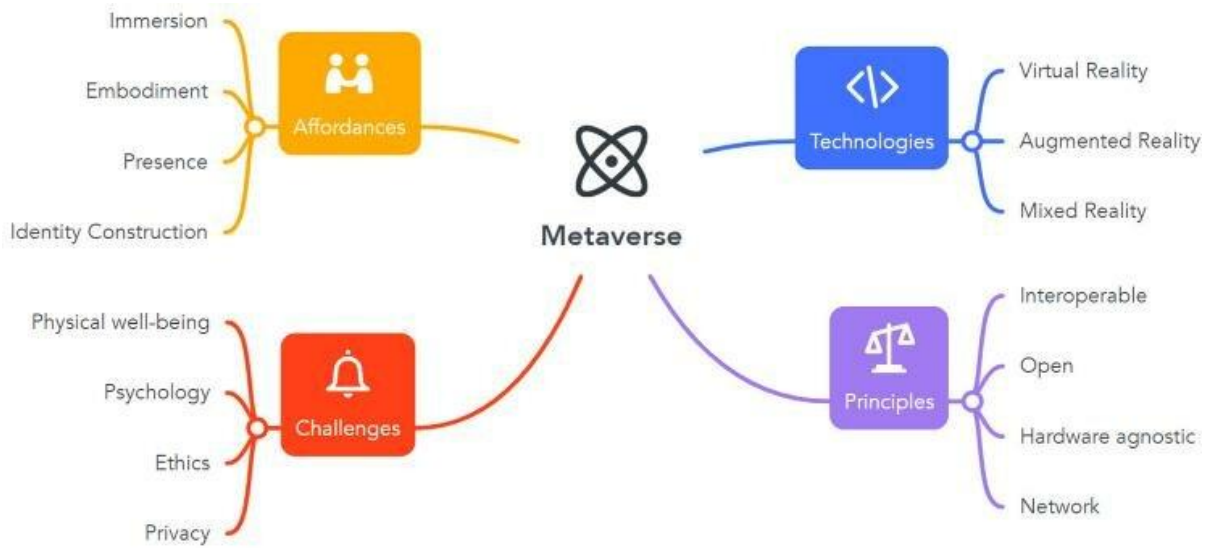
Lee (2021) conducted interviews with 71 teacher candidates to reveal their perceptions of metaverse technology and, as a result of analysing the responses, found that teacher candidates had a very high level of understanding of the metaverse. Teacher candidates view metaverse technology as a good tool for delivering higher quality education. Research recommendations included developing metaverse educational content based on instructional design, providing financial support for the implementation of the metaverse in educational settings, and providing training opportunities for teachers to teach about the metaverse. In their study, Hwang and Lee (2024) aimed to analyse English teachers' levels of technological acceptance and perceptions of the potential for teaching language through the metaverse based on their metaverse classroom experiences. To achieve this goal, a thorough analysis of survey and opinion data collected from 30 English teachers involved in creating and sharing a metaverse classroom was conducted. The results of the study show that the flexible and reconfigurable metaverse classroom design increased participants' self-efficacy, autonomy, and technological capabilities. Sentiment analysis revealed that participants had a positive experience in creating the metaverse classroom. Keyword network analysis showed that the metaverse environment facilitates experience sharing and contextualised learning. Based on the findings, this study proposes some educational policies that consider not only theoretical aspects but also pedagogical perspectives. To reveal academics' perceptions of metaverse technology and its potential applications in educational settings within the context of higher education institutions in Jiangsu Province, China, Xiaolan and Timmaz (2024) collected data from 389 academics via questionnaires. The findings obtained from analysing the participants' responses revealed that demographic factors such as the academics' age, academic qualifications, years of teaching experience, and attitudes towards new educational technologies significantly influenced their perceptions regarding the use of metaverse technologies in universities. Shamsudin et al. (2024) discuss the metaverse technology, created by combining physical and virtual reality, as being important for developing the education programmes of teacher candidates at universities. Their study aims to discover teacher candidates' perceptions regarding the application of metaverse technologies in education programmes at higher education institutions. Findings from a survey administered to 300 teacher candidates and interviews conducted with a selected group of participants reveal that teacher candidates generally hold a positive perception of metaverse technology as an innovative and engaging learning environment that can enhance interaction, collaboration, and real-world simulation in teacher education. However, concerns were expressed regarding technical difficulties associated with the metaverse, the learning curve, and potential distractions. Additionally, participants stated that they needed sufficient training and support to effectively integrate metaverse technologies into teaching practices. The study concludes with recommendations for universities and teacher training institutions to provide the necessary infrastructural, technical, and pedagogical support to facilitate the successful implementation of metaverse technologies in teacher training programmes.

### **1.2. Metaverse and WEB 3.0**

The concept of metaverse was used in Neal Stephenson's novel *Snow Crash*. Duan et al. (2021) defined the metaverse as a concept consisting of three-dimensional virtual environment applications and avatars interacting together; universe, which is born from the concepts of meta and verse. The metaverse is accepted as an important concept that builds a three-dimensional environment on the basis of augmented reality, creates an image as a reflection of the real world, builds economic platforms related to the concept of blockchain, integrates the real and virtual world, and enables users to create various content and environments (Ning et al., 2021).

**Figure 1**

*Metaverse Technologies, Rules, Opportunities and Challenges*



Source: *Mystakidis, 2022, p. 494*)

Figure 1 shows the technologies, rules, opportunities and challenges related to the concept of metaverse. The elements shown in the figure are of great importance in terms of making a general evaluation of the metaverse concept.

**Table 1**

*Features of WEB 1.0, 2.0 and 3.0*

	Web 1.0	Web 2.0	Web 3.0
<b>Interaction</b>	Reading	Reading-Writing	Reading-Writing-Possession
<b>Tool</b>	Static Text	Interactive Content	Virtual Economies
<b>Organization</b>	Companies	Platforms	Networks
<b>Control</b>	Decentralized	Central	Decentralized

Source: Grayscale Research, 2021, p.5 (Cit. Arvas, 2022, p.65)

Information and communication technologies and the Internet have created an intertwined ecosystem and have gained an important place in the digitalised world. Firstly, as shown in Table 1, the first generation internet, which started with WEB 1.0, enabled one-sided content production and communication. Later, with WEB 2.0, interactive content was created and centralised platforms were built. Afterwards, networks were created in a decentralised control process, virtual economies were built and a process of reading, writing and owning processes started to be experienced with WEB 3.0. With these advances, a modern understanding of education has gained more importance with the presence of trans-universal elements. With digital literacy, there have been changes in the duties and responsibilities undertaken by school administrators, teachers, students, parents and other education system stakeholders.

With this study, an in-depth perspective was tried to be provided by taking opinions from school administrators who serve as the main actors in the education system. Metaverse and WEB 3.0 concepts are among the important concepts that the education system benefits in achieving social gains in interaction with the education system. It is noteworthy to make positive and negative determinations about these concepts and to benefit from these determinations in educational planning. In order to

construct the educational ecosystem of school administrators who undertake an important task in the education community correctly and efficiently, it is thought that the findings of this study and the data on the concepts of metaverse and WEB 3.0 will contribute to the relevant literature in terms of planning more meaningful educational processes.

The concept of the metaverse was first used in the science fiction novel *Snow Crash* (Parasite) in 1992 (Stephenson, 1992). On the metaverse platform, users interact with each other through their avatars (Suh & Ahn, 2022). Metaverse technology eliminates the constraints of time and space, acting as a bridge between the virtual and real worlds. This allows users to be present in environments they cannot or would not be present in real life through virtual environments, broadening their horizons and gaining different experiences. Metaverse technologies offer the opportunity for individualized learning and learning through play.

We should anticipate that we will see the mental experience that the developing WEB 3.0 and the metaverse, influenced by it, provide in the field of education in the coming years. Learning simulations tailored to individuals' interests and needs, portable laboratories, and educational environments that can be customized as desired in various virtual environments are no longer far away. In an age where technological advancements and artificial intelligence robots simplify and guide our lives, smart machines that can guide us and learn the information we want in the educational environment are no utopia. For example, it's only a matter of time before metaverse products, which use augmented reality to visualize students' unfathomable science experiments or unsolved physics problems, will also find their place in our lives in the coming years. Following these developments, education will now move beyond the confines of four walls and provide learners with intellectual experiences, ensuring retention. These educational developments will also lead to the emergence of new professional groups that will serve the digital age.

Today, thanks to the transformations in the world of technology, scientific advancements, and changes in internet speed, people can now communicate independently of time and place and instantly share important information or documents. All these conveniences have been made possible by the rapid introduction of the internet into our lives and its subsequent development and evolution. These rapid advances have led to various changes in many areas of life. With the development of Web 3.0 and the emergence of components of the beyond, the traditional approach to education has given way to global education. In this century, accessing information has become increasingly easy, and global power has shifted to countries or companies that can access information and rapidly integrate it into our lives. Of course, education plays a major role in the speed and efficiency of all these developments. It is believed that national policies should be established and various studies should be conducted by the Ministry of National Education to avoid falling behind technologically and to utilize technological innovations like the metaverse most effectively. For example, one study emphasizes the need to provide Turkish language support for augmented reality tools (Soylu, 2019). For this purpose, it is recommended to take as an example and compare countries that have made progress in this area (Damar, 2021).

Regarding WEB 3.0 and education, there are three foundations of a learning environment for semantic WEB technologies. The first is the capacity to effectively store and organize information. The Semantic WEB enables easy retrieval of information from information. The second is the ability to address the specific needs of students and teachers. Finally, the third foundation is the determination of metadata that defines content (Elagili, 2016). While the effective or meaningful information we access in education elevates our education and development, storing and organizing this data for re-accessibility is also crucial. WEB 3.0 not only enables access to meaningful information in education, but also facilitates the organization and storage of this information. Education is a systematic process that is not uniform and is influenced by many different factors and individuals. This non-uniform process creates

specific needs. Each student's learning environment is different, leading to different learning methods and timeframes. Therefore, educational administrators, teachers, and students will want to follow different paths in the educational process to meet their individual needs. It is precisely at this point that WEB 3.0 technologies meet this need of educational administrators, teachers, and students. To this end, the research aims to uncover the views of school administrators on the concepts of the metaverse and WEB 3.0. To this end, the following questions were addressed:

1. What are school administrators' views on the concept of the metaverse?
2. What are school administrators' views on the concepts of avatar and metahuman?
3. What are school administrators' views on the concept of innovative business?
4. What are school administrators' views on the concept of WEB 3.0?
5. What are school administrators' views on the relationship between the metaverse and WEB 3.0?

This study sought to provide an in-depth perspective by gathering opinions from school administrators, who play a leading role in the education system. The concepts of Metaverse and WEB 3.0 are among the important concepts that benefit the education system in achieving social gains through interaction with the education system. It is noteworthy that positive and negative findings related to these concepts have been identified and that these findings are utilised in educational planning. Given the lack of direct studies on school administrators and the importance of their role in the education community, it is thought that the findings of this study and the data obtained on the concepts of the metaverse and WEB 3.0 will contribute to the relevant literature by enabling the planning of more meaningful educational processes and the proper and efficient structuring of the education ecosystem.

## **2. Method**

### **2.1. Research Design**

The study utilized phenomenology, a qualitative research method. Creswell (2013) stated that phenomenology is one of the qualitative research methods that reveal common aspects of experiences related to a phenomenon or concept. This study planned to obtain findings regarding school administrators' views on the metaverse and the concept of WEB 3.0 through an online form. School administrators participating in the study were asked to answer a form consisting of 12 questions, 4 closed-ended and 8 open-ended. Yıldırım and Şimşek (2011) stated that evaluations are made about the factors that affect the situations identified in such case studies. To maximize the level of diversity, participants were included in the study. Criterion sampling method was used to take into account the criterion or criteria for participants (Baltacı, 2019; Lincoln & Guba, 1985) and the relative variables such as title, gender, age, educational background, branch, and diversity (Creswell & Clark, 2015). An appropriate sample group was selected for participation in the study. The purpose of this research is to assess school administrators' current knowledge of the concepts of the metaverse and WEB 3.0. Obtaining their opinions on the concepts of the metaverse and WEB 3.0 will contribute to the achievement of the research's objectives.

### **2.2. Study Group**

The population of the study consists of school administrators working in Isparta in the 2023-2024 academic year. The sample of the research consists of 47 school administrators working in Isparta province in the 2023-2024 academic year. Participants' participation in the study was made on a voluntary basis. Kerlinger and Lee (1999) stated that simple random sampling is a type of sampling in which the possible combination of all the elements in the universe has an equal probability to be accepted as a sample and there is a sampling scope covering all the elements of the universe.

**Table 2***Frequency and Percentage Distributions of Demographic Characteristics of Participants*

Demographic Characteristics	Category	Number	Valid Percentage (%)
Gender	Male	34	72.3%
	Woman	13	27.7%
Profession	Head teacher	10	21.3%
	Expert Teacher	32	68.1%
	Teacher	5	10.6%
Title	Deputy Head of School/Institution	2	4.3%
	Deputy Director of School/Institution	16	34.0%
	School/Institution Manager	29	61.7%
Age	30-40	10	21.3%
	41-50	21	44.7%
	51 and over	16	34.0%
Professional Seniority	0-10 Years	5	10.6%
	11-21 Years	12	25.5%
	22 Years and above	30	63.8%
Educational Status	Undergraduate	37	78.7%
	Graduate	10	21.3%
School Type	Anatolian High School	9	19.1%
	Vocational and Technical Anatolian High School	8	17.0%
	Preschool	3	6.4%
	Middle school	14	29.8%
	Primary school	13	27.7%
Number of Teachers in the School/Institution	0-20	27	57.4%
	21-40	11	23.4%
	41-60	8	17.0%
	61 and above	1	2.1%
Number of Students in the School/Institution	0-250	29	61.7%
	251-500	6	12.8%
	501-750	9	19.1%
	750 and above	3	6.4%

In Table 2, the personal information of the participants is explained in detail. When Table 2 was analysed, it was seen that 72.3% of the participants were male, 68.1% were expert teachers, 61.7% were school/institution principals, 44.7% were between the ages of 41-50, 63.8% had a professional seniority of 22 years or more, 78.7% were undergraduate graduates, 29.8% worked in secondary schools, 57.4% worked in schools with 0-20 teachers and 61.7% worked in schools with 0-250 students. Head teacher is a senior career title given to teachers who have at least 10 years of service as a specialist teacher and have completed the Head Teacher Training Programme organised by the Ministry of National Education. Expert teachers are teachers who have at least 10 years of seniority, have completed the training programme and passed the examination/assessment, and are entitled to special compensation.

### 2.3. Data Collection Tools

This study is limited to the interview data obtained from school administrators working in Isparta province. A form consisting of 12 questions about metaverse and WEB 3.0 concepts was used in the study. Mason (2002) stated that the method used to capture the thoughts and feelings of the participants in any research and to obtain detailed information about their situations is the most commonly used interview technique in qualitative studies. Yıldırım and Şimşek (2011) stated that this interview technique is used efficiently in studies where more than one participant is involved in the research. The school administrators participating in the study serve as principals and vice principals. The study group was selected using maximum variation, a purposive sampling method. The purpose of maximum variation sampling is not to achieve this variation for generalization purposes, but rather to identify commonalities across diverse situations and, based on this variation, to reveal different dimensions of the problem (Merriam, 2013; Yıldırım & Şimşek, 2011). A semi-structured interview form regarding the metaverse and WEB 3.0, intended for school administrators, was used as the data collection tool in the study. A literature review was conducted to develop the interview form, and other relevant studies were reviewed. A draft form was prepared based on the obtained data and presented to two faculty members for expert opinion. After consulting with field experts, the questions on the form were finalized. The interview form included five questions regarding school administrators' concepts of the metaverse and the metaverse world, two questions regarding the concepts of avatar and metahuman, two questions regarding the concept of innovative business, one question regarding the concept of WEB 3.0, and two questions regarding the relationship between the metaverse and WEB 3.0. The research questions aimed to assess school administrators' current knowledge of the concepts of the metaverse and WEB 3.0.

### 2.4. Analysis

Ethical principles were adhered to during the data collection process. Data were collected on a voluntary basis. Participants were informed about the study beforehand, and consent was obtained. Participants were informed that their personal information would be kept confidential and that their data would be used only for research purposes. In the research, the analysis of the data was completed by using the content analysis method. Büyüköztürk et al. (2021) stated that content analysis is a technique that provides an opportunity to work indirectly to determine people's attitudes and behaviours. All kinds of meaningful expressions, patterns and words in the content were studied and codes were created. Neuman (2006) stated the importance of qualitative coding in data analysis. Similar codes were studied and concepts were classified. The classifications created are important in obtaining valid and reliable findings in data analysis. While quoting the opinions of the participants, abbreviations such as SA1, SA2 and similar abbreviations were used for school administrators.

The validity of the study was ensured by obtaining feedback from participating school administrators. Furthermore, the validity process for the study was conducted in accordance with expert opinion. To ensure validity, researcher triangulation and the inclusion of direct, verbatim quotations within the text were used (Patton, 2014). Reliability data were calculated using the Miles and Huberman (1994) formula of consensus/consensus+disagreement x 100. The research findings were reviewed by an observer with qualitative research experience working in the metaverse, and a high degree of consensus was achieved. Obtaining the opinions of participating school administrators in each role, making observations, and receiving continuous feedback demonstrated that the research met reliability criteria (Yıldırım & Şimşek, 2011).

### 2.5. Ethics Committee Approval

The approval of the ethics committee, dated 14.05.2024 and numbered 193/02, was received from Isparta University of Applied Sciences. All procedures performed in these studies were by the APA ethical guidelines, the ethical standards of the institutional research committee, and the 1964 Helsinki Declaration and its later amendments.

### 3. Findings

In this section, the findings obtained from the responses received from the school administrators who participated in line with the aims of the research are presented.

**Table 3**

*Have You Heard of the Concept of Metaverse Before?*

Answers	Frequency	Per cent
Yes	36	76.5%
No	11	23.4%

Table 3 shows that 36 participants (76.5%) answered "Yes" and 11 participants (23.4%) answered "No" regarding whether the participant school administrators had heard of the concept of metaverse before.

**Table 4**

*Can You Define the Metaverse?*

Answers	Frequency	Per cent
Virtual universe	21	44,7%
Virtual reality	18	38,3%
Digital life	2	4,3%
Beyond reality	1	2,1%
The world beyond reality	1	2,1%
Editing technology	1	2,1%
Communication, marketing, education, entertainment in the virtual world	1	2,1%
Virtual fraud	1	2,1%

In table 4, participant school administrators expressed the concept of metaverse with concepts such as virtual universe (21), virtual reality (18), digital life (2), unreal (1), unreal world (1), fiction technology (1), communication, marketing, education, entertainment in virtual world (1) and virtual fraud (1).

**Table 5**

*Have You Heard of VR, MR and AR Concepts Related to the Metaverse World (Beyond the Universe)?*

Answers	Frequency	Per cent
Yes	17	36.2%
No	30	63.8%

In table 5, it is seen that 17 participants (36.2%) answered "Yes" and 30 participants (63.8%) answered "No" regarding whether the participant school administrators have heard of VR, MR and AR concepts related to the metaverse world (beyond the universe).

**Table 6***Can You Explain These Concepts if You Have Heard Them?*

Answers	Frequency	Per cent
Augmented reality	13	27,7%
Virtual reality	13	27,7%
Mixed reality	6	12,8%
Technological devices	1	2,1%
Health related device	1	2,1%
Hybrid system	1	2,1%
I heard	16	34,0%
Didn't hear	31	66,0%

In table 6, the participant school administrators expressed whether they had heard of VR, MR and AR concepts related to the metaverse world (beyond the universe) with concepts such as augmented reality (13), virtual reality (13), mixed reality (5), technological devices (1), health-related device (1) and hybrid system (1). In addition, it was found that 34% (16) of the participant managers in the study had heard of the related concepts and 66% (31) had not.

**Table 7***Have You Heard of the Concepts of Avatar and Metahuman?*

Answers	Frequency	Per cent
Yes	29	61.7%
No	18	38.3%

In table 7, it is seen that 29 participants (61.7%) answered "Yes" and 18 participants (38.3%) answered "No" regarding whether the participant school administrators had heard of the concepts of avatar and metahuman before.

**Table 8***Can You Define the Concepts of Avatar and Metahuman?*

Avatar	Frequency	Per cent
Graphical representation of the person	2	4,3%
Digital representative of users	2	4,3%
Graphs of users' characters and personalities	1	2,1%
Digital representation of a person or character	1	2,1%
Graphical expression of personal characteristics	1	2,1%
User icon	1	2,1%
Drawing representing a person in a virtual environment	1	2,1%
Two- or three-dimensional icon	1	2,1%
The counterpart of individuals beyond the universe	1	2,1%
Realistic three-dimensional view	1	2,1%
3D human reproduction	1	2,1%
Talking picture that can move	1	2,1%
Virtual file	1	2,1%
Description of people in virtual reality	1	2,1%
The character representing the person in the virtual environment	1	2,1%
Metahuman	Frequency	Per cent
3D digital human	6	12,8%
Character created by the user	1	2,1%
Unlimited reality	1	2,1%

Surreal digital reality	1	2,1%
I don't know	25	53,2%

In table 8, the participant school administrators defined the concept of avatar as personal graphic representation (2), digital representation of users (2), graphics of users' characters and personalities (1), digital representation of the person or character (1), graphical expression of personal characteristics (1), user icon (1), drawing representing the person in virtual environment (1), they defined the concept of metahuman with concepts such as two or three dimensional symbol (1), the counterpart of individuals beyond the universe (1), realistic three-dimensional appearance (1), producing 3D people (1), talking picture that can move (1), virtual file (1), definition of people in virtual reality (1) and character representing a person in virtual environment (1). Participant school administrators defined the concept of metahuman with concepts such as 3D digital human (6), the character created by the user (1), unlimited reality (1) and surreal digital reality (1). In addition, 53.2% (25) of the participant administrators in the study stated that they did not have any knowledge about the related concepts.

**Table 9***What is NFT?*

Answers	Frequency	Per cent
A type of cryptocurrency	13	27,7%
Digital asset	3	6,4%
Digital production that cannot be copied	2	4,3%
Qualified intellectual property	1	2,1%
Some kind of certification method related to cryptocurrency	1	2,1%
Virtual sales	1	2,1%
Representation of artistic works in virtual environment	1	2,1%
I don't know	25	53,2%

In table 9, participant school administrators expressed what NFT is with concepts such as a kind of cryptocurrency (13), virtual reality (13), digital asset (3), digital production that cannot be copied (2), qualified intellectual property (1), a kind of certification method related to cryptocurrency (1), virtual sales (1) and representation of artistic works in virtual environment (1). In addition, it was found that 53.2% (25) of the participant managers in the study had no knowledge about the relevant concept.

**Table 10***Could You Explain the Concept of Innovative Business?*

Answers	Frequency	Per cent
Innovative business	9	19,1%
New creative ideas	3	6,4%
Continuously developing companies dominating the market	3	6,4%
Developing methods and methods in an enterprise	3	6,4%
Innovations to improve the world of work	2	4,3%
Business to market in the future	1	2,1%
Finding solutions by combining problems with new ideas	1	2,1%
Virtual remediation platform	1	2,1%
Improvements in products and services	1	2,1%
I don't know	25	53,2%

In table 10, the participant school administrators expressed the concept of innovative business with concepts such as business open to innovations (9), new creative ideas (3), continuously developing companies dominating the market (3), developing methods and methods in an enterprise (3), innovations made to improve the business world (2), business that will make a market in the future (1), finding solutions to problems by combining new ideas (1), virtual improvement platform (1) and improvements

in products and services (1). In addition, it was found that 53.2 per cent (25) of the participant managers in the study had no knowledge about the related concept.

**Table 11**

*Could You Explain the Concept of WEB 3.0?*

Answers	Frequency	Per cent
Web technology using artificial intelligence	5	10,6%
Advanced version of the Internet	5	10,6%
Platform where content is produced with artificial intelligence	4	8,5%
Decentralised version of the Internet	3	6,4%
A new WEB concept	2	4,3%
Internet of the Future	1	2,1%
An organisation outside the Internet environment	1	2,1%
The space where users create their digital assets	1	2,1%
Database	1	2,1%
3rd Generation of WEB tools	1	2,1%
Next level of WEB interaction	1	2,1%
I don't know	22	46,8%

In table 11, the participant school administrators expressed the concept of WEB 3.0 with concepts such as WEB technology using artificial intelligence (5), advanced version of the Internet (5), platform where content is produced with artificial intelligence (4), decentralised version of the Internet (3), a new WEB concept (2), the Internet of the future (1), a formation outside the Internet environment (1), an area where users create their digital assets (1), database (1), the 3rd generation of WEB tools (1) and the next level of WEB interaction (1). In addition, it was found that 46.8% (22) of the participant managers in the study had no knowledge about the related concept.

**Table 12**

*What are Your Thoughts about the Metaverse?*

Answers	Frequency	Per cent
Positive	10	21,3%
Negative	7	14,9%
Description	7	14,9%
No opinion	22	46,8%

In table 12, when the participant school administrators were asked about their opinions on metaverse, it was found that 21.3% of them had a positive opinion, 14.9% had a negative opinion, 14.9% defined the concept of metaverse and 46.8% had no idea about it. Some of the opinions of the participants about the definitions of metaverse are presented.

*OY3: "It is a system that transitions people from reality to virtuality."*

*OY17: "Perhaps we live in the virtual universe world that we met with the Matrix film, or this virtual world created by human beings is the achievement of immortality."*

*OY41: "Decentralised virtual universe."*

**Table 13**

*Is There a Relationship Between Metaverse and WEB 3.0?*

Answers	Frequency	Per cent
Yes	32	68.1%
No	15	31.9%

In table 13, when the participant school administrators were asked about any relationship between metaverse and WEB 3.0, 32 participants (68.1%) answered "Yes" and 15 participants (31.9%) answered "No".

**Table 14**

*Explain a Relationship Between Metaverse and WEB 3.0.*

Answers	Frequency	Per cent
Artificial intelligence product	6	12,8%
Personal Internet	5	10,6%
Digital applications	4	8,5%
Virtual reality	3	6,4%
Decentralised Internet environment	3	6,4%
No opinion	26	55,3%

In table 14, when the participant school administrators were asked about any relationship between metaverse and WEB 3.0, they expressed the related concepts with concepts such as artificial intelligence product (6), personal Internet (5), digital applications (4), virtual reality (3) and decentralised Internet environment (3). In addition, it was found that 55.3% (26) of the participant administrators in the study had no knowledge about the related relationship.

#### **4. Discussion, Conclusion and Recommendations**

The dynamic structure of information and communication technologies enables significant new developments in social life. Many issues that could not even be imagined by human beings in the past are becoming possible and even beyond possible today. The concepts of metaverse, which is accepted as a digital universe beyond the Internet, and WEB 3.0, which is expressed as the WEB of data, bring a different era in the age of communication and interaction.

The majority of the school administrators participating in the study stated that they had heard of the concept of metaverse before. The participants made definitions about the concept of metaverse as virtual universe, virtual reality, digital life, surreal, surreal world, and fiction technology, communication in virtual world, marketing, education, entertainment and virtual fraud. In the study conducted by Ağgöl et al. (2023), pre-service teachers who expressed their opinions about the concept of metaverse expressed this concept as augmented reality devices, Internet supporting three-dimensional environment, universe with augmented reality, life compatible with new technology, artificial physical environment, fictional universe, virtual way of creating a profile. Gün and Öz (2024), in order to present their views on the concept of the metaverse, conducted interviews with Turkish language teaching candidates in their third and fourth years at Mersin University and found that more than half of the students had no knowledge of the concept of the metaverse. Aydın (2023), in his study on foreign language teachers' perceptions of using the metaverse in the teaching process, stated that foreign language teachers had little familiarity with metaverse applications in language teaching but had a positive attitude towards using the metaverse. Eşin and Özdemir (2022), who presented the views of mathematics teachers, a different branch, on metaverse technology, stated in their study, which consulted the opinions of 70 mathematics teachers, that teachers generally found metaverse technology useful. These differences based on subject area can be attributed to the fact that the training teachers receive varies according to their subject area, or that their individual interest in metaverse technology is not the same.

Although the majority of the school administrators participating in the research stated that they had heard of the concept of metaverse before, it was found that the majority of the participants had not heard of VR, MR and AR concepts related to the metaverse world (beyond the universe). Participant

school administrators expressed whether they had heard of VR, MR and AR concepts related to the metaverse world (beyond the universe) with concepts such as augmented reality, virtual reality, mixed reality, technological devices, health-related devices and hybrid systems. The prospective teachers explained the concepts of VR, MR and AR as game and film glasses, virtual reality glasses, extended reality, virtual reality, augmented reality and mixed reality (Ağgöl et al., 2023). The Metaverse, which has become one of the most popular concepts of our time, was first used 30 years ago and has been described as a mixed-reality environment suitable for multi-user interactions, bringing together physical and virtual realities (Bakır, 2022).

More than half of the school administrators participating in the study stated that they had heard the concepts of avatar and metahuman before. The participant administrators explained the concept of avatar with concepts such as personal graphic representation, digital representation of users, graphics of users' characters and personalities, digital representation of the person or character, graphical expression of personal characteristics, user icon, drawing representing the person in the virtual environment, two or three dimensional icon, counterpart of individuals beyond the universe, realistic three-dimensional appearance, 3D human generation, moving talking picture, virtual file, definition of people in virtual reality and character representing the person in virtual environment. Participant managers expressed the concept of metahuman with concepts such as 3D digital human, the character created by the user, unlimited reality and digital reality beyond reality. In the study conducted by Ağgöl et al. (2023), pre-service teachers who expressed their opinions explained the terms avatar and metahuman as three-dimensional human model, digital human copy, virtual identity on the internet, metaverse reflection, creature, small pictures/figures, blue human and beyond human. As metaverse technology features a three-dimensional environment, it enables users to interact and collaborate (Garavand & Aslani, 2022).

It was determined that more than half of the participating school administrators did not have information about the concept of NFTs. Businesses in the metaverse universe are not fully ready for the use of consumers and especially NFTs need to be introduced and explained (Çelikkol, 2022:73). Regarding what the concept of NFT is, the answers of some kind of cryptocurrency, virtual reality, digital asset, digital production that cannot be copied, qualified intellectual property, some kind of certification method related to cryptocurrency, virtual sales and representation of artistic works in the virtual environment were expressed. Pre-service teachers explained the concept of NFT as unchangeable token, purchasing platform, saleable asset, digital market/environment, cryptocurrency, virtual money/material and digital certificate (Ağgöl et al., 2023). Participants who presented their projects in the metaverse environment at the conclusion of the training sessions at Süleyman Demirel University's Metaverse Entrepreneurship Studio described the experience as exciting, educational, calming, engaging, fun, stress-relieving and interactive (Göktaş & Hazarhun, 2024). Due to the benefits that metaverse technology offers to individuals, it has begun to be utilised in the field of education, and metaverse studios are now being made available to students at various universities (Şentürk et al., 2022).

According to the results of the research, more than half of the participant school administrators have no knowledge about the concept of innovative business. They explained this concept as an enterprise open to innovations, new creative ideas, constantly developing companies dominating the market, developing methods and methods in an enterprise, innovations made to improve the business world, an enterprise that will make a market in the future, finding solutions to problems by combining new ideas, virtual improvement platform and improvements in products and services. In the research conducted by Ağgöl et al. (2023), this concept was defined by the participants as producing solutions, innovative business, providing services, developing products, providing new generation technology and metaverse products, and developing new ideas. As the metaverse experience involves the intertwining

of virtual reality, augmented reality and mixed reality technologies, it offers users a variety of experiences (Argan et al., 2022).

There may be several reasons why more than half of school administrators lack knowledge about avatars, metahumans, and innovative business concepts. Among these reasons, age and professional seniority variables can be considered particularly relevant in this study. This situation can be explained by the fact that over 78% of the participants in the study were aged 40 and above, and 88% had 11 years or more of professional seniority.

It was determined that more than half of the participating school administrators were familiar with the concept of WEB 3.0. Furthermore, participating school administrators described the concept of WEB 3.0 as WEB technology utilising artificial intelligence, an advanced form of the Internet, a platform where content is generated by artificial intelligence, a decentralised version of the Internet, a new WEB concept, the Internet of the future, a formation outside the Internet environment, an area where users create their digital assets, a database, and the next level of WEB tools and WEB interaction. Generation, and the next level of WEB interaction.

It has been determined that Turkish teacher candidates have very limited knowledge about the concepts of Metaverse and WEB 3.0, and that they are not sufficiently familiar with concepts related to Metaverse and WEB 3.0, such as NFT, innovative business, AR, MR, VR, avatar, and metahuman (Gün & Öz, 2024). The study titled 'Examining Prospective Teachers' Attitudes Towards Metaverse Use' found that prospective teachers' attitudes towards Metaverse use were high and that their attitudes did not differ according to gender or age (Akman, 2023). The study titled 'Training Programme for Developing Prospective Teachers' Metaverse Content Creation Competence' examined prospective teachers' ability to develop high-level metadata-based educational content (Lee et al., 2023). The sample of the study consisted of 16 prospective teachers studying at a faculty of education. Prospective teachers were given a pre-test on producing educational content on the Metaverse, and after the training, the post-test results showed that their ability to produce educational content on the Metaverse had improved. In the study titled 'Metaverse Knowledge Level: An Investigation on Physical Education and Sports Teacher Candidates,' it was determined that the Metaverse knowledge levels of teacher candidates who answered "yes" to the variable of hearing the term Metaverse were significantly higher than those of teacher candidates who answered 'no' (Savaş et al., 2022). In the studies by Türk and Darı (2022), the Metaverse is considered a technology that is still in its development phase and whose conceptual framework has not been clearly defined. Yağcı and Çağır (2025) stated in their study titled 'Doctoral students' views on the Metaverse' that doctoral students' views on the current state of the Metaverse showed that they believed the technology was in various stages of development.

It was determined that more than half of the participant school administrators had knowledge about the concept of WEB 3.0. In addition, participant school administrators explained the concept of WEB 3.0 as WEB technology using artificial intelligence, an advanced version of the Internet, a platform where content is produced with artificial intelligence, a decentralised version of the Internet, a new WEB concept, the Internet of the future, a formation outside the Internet environment, an area where users create their digital assets, a database, the 3rd generation of WEB tools and the next level of WEB interaction.

According to the results of the research, when the participant school administrators were asked about their thoughts about metaverse, it was seen that their thoughts were more positive and they were able to define this concept. In addition, when school administrators were asked about any relationship between metaverse and WEB 3.0, more than half of the participants stated that there is a relationship, but they did not have any idea about this relationship. When the participant school administrators were

asked about any relationship between metaverse and WEB 3.0, they described the related concepts as artificial intelligence product, personal Internet, digital applications, virtual reality and decentralised Internet environment. In the study conducted by Ağgöl et al. (2023), the concepts of metaverse itself, Web 2.0's improved version, new world foundation, fast Internet environment, upper version of the Internet, revolution in the Internet and computer term were expressed in relation to this relationship. In today's world where information and communication is in a spiral and vertical progress, all vital elements of social, social, individual and scientific life have significant effects on human life. The only solution to carry out this process correctly is to increase awareness of the relevant situation, innovation or subject in order to adapt to new situations, and to internalise the learning, application and evaluation processes. With the introduction of the Internet and digital tools and equipment into social life, especially in terms of consumption, end users have experienced three major innovation trends. Finally, the fourth trend is considered to be the computing paradigms in which the concepts of metaverse and WEB 3.0, which include spatial and dynamic technologies such as virtual reality, augmented reality, mixed reality and other elements, are processed. Teachers' attitudes towards gaining knowledge about the Metaverse are positive, and when prospective teachers receive the necessary training, their ability to produce educational content on the Metaverse improves (Gün & Öz, 2024). In their study titled 'The Metaverse in mathematics education: The opinions of secondary school mathematics teachers' (2022), Şeyma Eşin and Emine Özdemir stated that mathematics teachers' attitudes towards the Metaverse are generally positive. Many definitions of the Metaverse emphasise its "virtual" nature, distinct from the real world (Cheng et al., 2022; Dionisio et al., 2013; Ergüney & Tepe, 2023; Koçak, 2023; Novak, 2022; Park & Kim, 2022; Şentürk & Yağcı, 2023; Yağcı & Şentürk, 2023; Zhao et al., 2022; Yağcı & Çağır, 2025).

As a result, although some of the necessary elements related to these concepts continue to be studied, school administrators, who have an important role in the education system, should be trained, informed and studies should be carried out for implementation. The importance of school administrators in achieving educational outcomes is seen as an undeniable situation. The role of the education system is very important for the concept of Society 5.0 (Özden, 2021), which aims to use information and technologies such as robotic logistics solutions (such as transport robots, conveyors), the Internet of Things, machine-to-machine communication, software programmes and systems for industrial manufacturers, cloud and edge computing, sensors and semiconductors, and industrial robots to benefit society. According to Muratoğlu (2005), societies that have and use knowledge are strong societies. For this, Demir (2005) stated that organisations should attach importance to knowledge management, production, sharing and use. The advances in the age of information and communication technologies depend on the fact that educational institutions are learning organisations more than other organisations (Turan & Karadağ, 2011). School administrators, who are the leaders of educational institutions as learning organisations, should take important responsibilities and learn about the information, documents, data, applications and systems that will fulfil the requirements of the concept of Society 5.0, which is current and, on the agenda, conduct research, experience learning processes, implement and evaluate. For this reason, it is expected that school administrators' views on the concepts of metaverse and WEB 3.0 will contribute to the steps to be taken at the point of internalising these concepts.

In order to realize digital transformation in higher education in terms of Metaverse's reflections on education, the "YÖK is Going Digital" project was carried out in Turkey in 2019, an essential step for University 4.0 (Akbaba & Mühürdaroğlu, 2022). In terms of the applicability of Metaverse in education, new strategic goals need to be determined in the Ministry of National Education and the Higher Education Institutions. It is crucial not only for school administrators but also for teachers, academics, and students to develop metaverse awareness and gain experience by applying it in education (Göktaş & Uygur, 2024). In this circumstance, infrastructure work must be sufficient to benefit from

current technology. The main aim of education is to ensure that the stages are conducted with an appropriate method by providing a suitable environment for the individual to reach the desired behaviours and attitudes. This stage focuses on ensuring one's adaptation to the learning period. With digital elements rapidly entering into learning life, technology awareness is one of the features that one is to have in the learning period. In this situation, it is seen that learners of all age groups can be successful in adapting to life by increasing their technology awareness. The concept of metaverse is also accepted as one of the digital elements on the agenda, and it is believed that it can contribute to individuals' learning processes. That is why it is suggested that the Metaverse concept be included within the formal education program and course outcomes. Furthermore, the inclusion of Metaverse and WEB 3.0 modules in in-service training programmes (within the Ministry of National Education) could be proposed to education policymakers as a contribution to this process. Last but not least, longitudinal studies could be planned for future research through 'pilot school applications' utilising technologies related to these concepts.

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