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INNOVATIVE ACCOUNTING AND AUDIT OF THE METAVERSE RESOURCES

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Abstract: *Active use of virtual electronic information environments – metaverses is the most perspective way of information and communication technologies development. In the meta-environment, traditional accounting objects undergo significant changes due to their intangible interpretation, which requires improving their accounting and auditing reflection. Accordingly, the purpose of this study is to improve the methodology and organization of accounting and auditing in the metaverse in terms of identification, recognition, and reflection in the accounting system of non-current intangible assets, goodwill of IT companies, NFT (non-fungible tokens), cryptocurrencies, sales costs and other objects in the meta-environment. To implement the purpose of scientific research, systemic, innovative, and institutional approaches and economic and mathematical modelling, bibliographic and comparative analysis have been used. Given the significant public distrust and active threats in the digital business, the need to introduce an audit in the metaverse to ensure the reliability, integrity, and legitimacy of information flows is justified. The possibility of recognizing from the standpoint of accounting and auditing of all virtual tools and objects of work that carry out the cycle in the meta-environment in the form of NFT, assets due to: uniqueness and separation from other accounting objects; opportunities for free purchase (sale) in the meta space, potential economic value in the case of retention and accumulation; reliable determination of value based on costs, sales contract or expert (market) assessment. It is proposed to classify NFT according to the criterion of useful life on non-current and current assets with the appropriate reflection in the composition of non-current and current intangible assets. The prospects of personalized marketing promotion of products (goods, services) in the metaverse with separate accounting of costs for the sale of tangible and intangible objects to ensure the reliability, analytical, and comparability of accounting information have been defined. As a result, a conclusion was formed on the expediency of transforming the reporting structure of meta-environment enterprises in terms of increasing the share of intangible assets and the potential absence of any tangible assets in terms of the full transfer of financial and economic activities in a virtual environment. The order of structuring the reporting of the enterprises of the metaverse needs further research.*
Keywords: accounting, audit, intangible assets, NFT, metaverse, resources, virtual digital information environment, IT companies.
JEL Classification: M10, M40, M41

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Introduction. In modern conditions of communication technologies development, the number of enterprises using cloud computing, blockchain structuring of information, and outsourcing services of delegation of functional powers is increasing. The digitalization of socio-economic processes and the remote performance of official duties due to the spread of the COVID-19 pandemic has led to minimizing the use of office and industrial premises. Not only have businesses optimized the cost of maintaining staff and farm buildings. However, they are increasingly reducing the share of tangible assets in the total asset balance. With the involvement of production outsourcing, there was a unique opportunity to abandon the use of the own fixed assets of the enterprise.

For non-manufacturing enterprises (especially IT enterprises), fixed assets belong to staff or landlords. For IT entities, all assets are only intangibles. Creating IT products (IT services) with the involvement of professionals working from home eliminates the need to use any current or non-current tangible assets. The operation of such enterprises leads to the formation of intellectual, informational, and image value, reflected as intangible assets and goodwill. The newest stage of transforming the role of intangible assets and goodwill in the socio-economic activity of enterprises is the formation of metaverses.

The metaverse is a virtual communication environment based on the further development of the Internet, in which value objects have only an intangible form. All economic processes related to the functioning of metaverses take place exclusively in virtual reality. Therefore, the article applied to the researchers interested in the further development of economic activity in metaverses and socio-economic features under virtual reality and augmented reality technologies. The number of such interested scientists increases yearly with the market capitalization of meta environments.

Global revenue from financial and economic activities in the metaverses will increase from $0.39 trillion in 2021 to $6.79 trillion in 2030. In 10 years, this target would increase extensively by 17.5 times, which indicates a significant investment potential in the market for virtual digital environments. Although a new stage in information and communication technologies leads to a reduced number of employees due to the automation of working processes, the development of meta-environments involves the growth of the labor market in this area. In particular, the number of specialists employed in meta-environments will increase from 2.62 million in 2021 to 23.36 million in 2030 (Fig. 1).

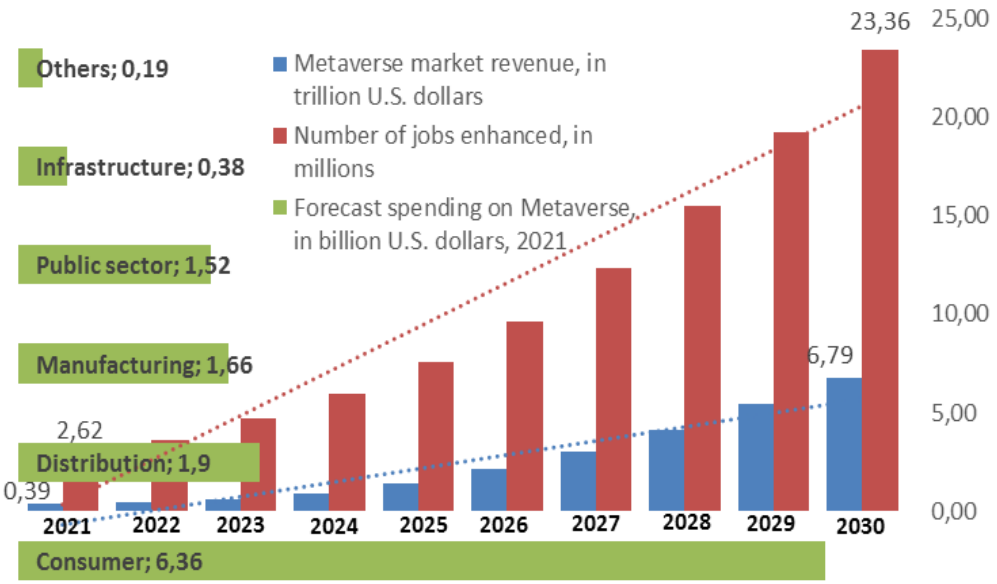

Fig. 1. Global indicators of income and expenditure in the metaverses and the numbers of people employed in this field

Source: based on (Metaverse market revenue worldwide), (Number of jobs enhanced by augmented reality (AR) and virtual reality (VR) worldwide)

The growth rate of this indicator is 8.9 for 2021-2030, which is less than the trends of the market capitalization of metaverses. But, at the same time, the increase in employment in metaverses is evidence of the demand for specialists in various technical and economic specialties. Improved functioning of meta-environments requires more highly skilled workers who can work in virtual e-management, marketing, accounting, analysis, audit, and taxation. Metaverse operators are investing heavily in training economic

professionals. In particular, in 2021, global consumer-oriented companies spent $6.36 billion on meta-environments, 1.9 billion on goods distribution, 1.66 billion on manufacturing, and 1.52 billion on the public sector, infrastructure, and communications - 0.38 billion (AR/VR forecast, 2020). The best investors in the development of metaverses are representatives of the gaming industry (43% of global market capitalization) and social media (23%) (Fig. 2). However, other companies from various sectors of the economy are actively involved in the development of meta environments.

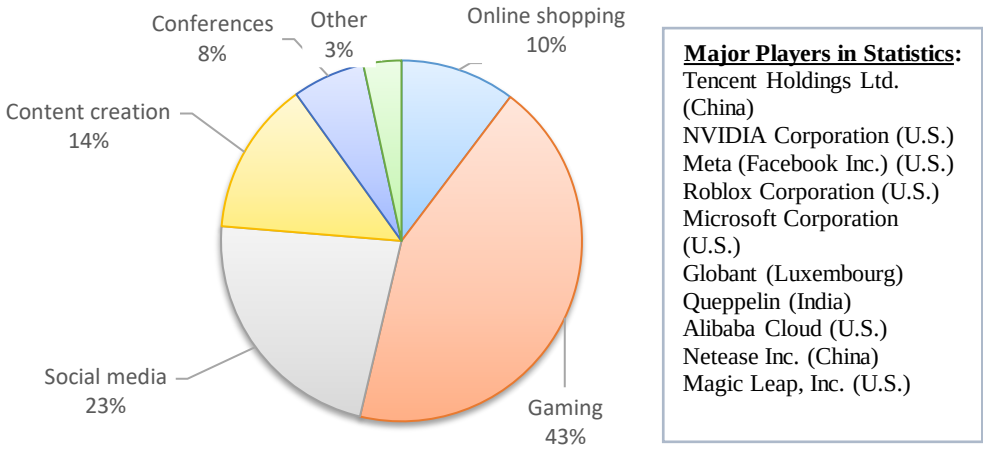

Figure 2. The market capitalization shares by metaverses industry, 2021
Sources: developed by the authors on the basis of (Fortune Business Insights, 2022).

The implementation of virtual reality and augmented reality technologies into various sectors of the economy and the interest of companies of different size, ownership, and organizational structure in investing in meta environments has caused the diversity of the company's intangible assets increases significantly in the conditions of the functioning of metaverses. It requires improvement in their structuring, accounting, and auditing. For the first time, the article's authors systematized traditional accounting objects in the context of their intangible interpretation in the metaverses functioning. The article is structured as follows: literature review of the scientific developments in the field of socio-economic aspects of the metaverse functioning; formation of the research aims and the methodology (research methods) for its achieving; obtaining the results of scientific research; clarification of the impact of the functioning of IT enterprises in the metaverse on accounting; determination of the prospects and the need for audit services in the meta-environment; identification of innovative accounting objects in metaverses and improving accounting and auditing recourses (intangible assets; non-fungible token; goodwill; marketing expenses and other objects in the virtual electronic information environment; conclusions and prospects for further scientific research). Obtaining research results rests on a literature review of the scientific developments in the field of socio-economic aspects of the metaverses functioning.

Literature Review. Developments of gaming and communication companies in metaverses are equally supported by scientific research. In particular, Seidel et al. (2022) considered the concept of financial and economical design of metaverses based on game technologies with the definition of economic postulates of their operation. In addition, Hemmati (2022) explained the economic relationships between participants in meta environments in virtual cities and gaming universes. Fernandez (2022) identified the directions of commercialization of metaverses in the example of the social network Facebook. Tunca et al. (2022) conducted similar studies on the potential development of business on the social network Twitter. Lin (2022) developed a concept for creating the market value of the business in the virtual universe. Silalahi (2022) stated that the development of metaverses is a real element of the digital economy, in which all business processes are electronic. Summarizing the scientific achievements of scientists makes it possible to determine the influence of the enterprise functioning impact in the metaverse on socio-economic processes.

Scientific research on identifying specific resources that arise in metaverses, which are the objects of accounting and auditing, has become widespread since 2022. In particular, Hughes (2022) predicts business development prospects in the metaverse, which involves the implementation of VR and related intangible objects in the social and economic processes. Taylor and Soneji (2022) defined that the metaverses development marks the actualization of the new science – bioinformatics, an important element of which is the formation of virtual information business environments. The socio-economic activity of enterprises in

business environments could take place exclusively in electronic form. It forms the goodwill of the enterprise as its biggest asset (Taylor and Soneji, 2022). According to Hollensen et al. (2022), product marketing is the most promising use of metaverses. Besides, Akkus et al. (2022) predicted a new stage in cryptocurrency development due to the dissemination of metaverses in which crypto assets are not only investment objects but also means and labours objects (non-fungible token – NFTs). Osivand (2021) explained the crucial role of NTFs and other crypto assets in the economic ecosystem of metaverses, which is a means of exchanging and accumulating virtual money between participants in economic relations. Instead, scientific papers haven't given attention to the importance of accounting and auditing in the virtual digital information environment. The only exception is the scientist Al Gnbri (2021), who identified areas of research and practical development in the field of accounting and auditing of financial and economic activities in the meta space. However, in the scientific environment, the metaverse's accounting and auditing reflection of the accounting objects (intangible assets, non-fungible tokens, goodwill, marketing expenses) is absent. The above allowed for forming the purpose and objects of the scientific article.

The study aims to improve the methodology and organization of accounting and auditing in the metaverse in terms of identification, recognition, and reflection in the accounting system of intangible assets, non-fungible tokens, goodwill, marketing expenses, and other objects that may occur in the meta environment. Achieving the goal defines the following tasks: to determine the impact of the functioning of IT enterprises in the metaverse on accounting; to determine the prospects and the need for audit services in the meta-environment; identification of innovative accounting objects; to improve the accounting and auditing of intangible assets, goodwill, operating expenses and other objects in the virtual electronic information environment. The objects of the article are the resources of metaverses (intangible assets, non-fungible tokens, goodwill, marketing expenses, and other objects that may occur in the meta-environment) from the point of view of their identification as objects of accounting and auditing. The scientific hypothesis of the study is the recognition of the metaverse as an innovative virtual electronic information environment. Its operation is associated with the emergence of new accounting objects, which requires improved accounting and audit control to confirm the reliability, legitimacy, and effectiveness of information processes in the meta space.

Methodology and research methods. To confirm the hypothesis, the study applied a specific methodology. In particular, the systematic approach helped to substantiate the information links of accounting, auditing, and the information environment of the metaverse. This approach revealed the prospects for improving accounting and auditing as important socio-economic activities for accounting information, confirming its reliability in the financial and economic processes in the meta-environment. Based on a systematic approach to conducting scientific research, a set of methods was used (Table 1). The use of research methods made it possible to obtain the article's results.

Table 1. Research methods

Section	Research method	Result
Introduction	Economic and mathematical modelling	The polynomial trend line was built using approximated and smoothed data using Excel spreadsheets to predict indicators of metaverse market revenue worldwide; the number of jobs enhanced in the metaverse to 2030 period and built on their basis graphs.
Literature Review	Bibliographic and comparative analysis	The empirical study was conducted using a bibliometric approach known as «analysis of common words» by keywords: «accounting» and «metaverse» in the information resource «ResearchGate». Comparative analysis revealed the resources of the metaverse, which are the main accounting objects.
Results	Innovative method	Identification of innovative changes in socio-economic processes in the metaverse.
	Energy-entropy research method	Prove the need to display the latest accounting objects (intangible assets, non-fungible tokens, goodwill, marketing expenses, and other objects) that have emerged in the meta-environment. Improve the accounting methodology and organization and audit these objects in the virtual electronic information environment.
Conclusions	Summarization of data and research synthesis	The authors' contributions to improving accounting and auditing in the metaverse and directions of further research in this area are determined.

Sources: developed by the authors.

Results. The metaverse is a virtual digital information environment in which all objects (land, buildings, household items, clothing, etc.) and entities (manufacturers, buyers, suppliers, government, and public

institutions) are in intangible form and interaction. Intangible universes are structured as maps or diagrams, with virtual streets and public spaces (Fernandez, 2022). Since such public virtual space is used for commercial activities, a promising area is for accounting and auditing services in the metaverse. No audit firm has acquired virtual real estate for the core business, although such intentions are being considered. Also, scientists have not thoroughly investigated the issue of accounting and audit in metaverses. Only Al Gnbri (2021) identified ways of improving the accounting and auditing of financial and economic activities in the metaverses. With the growth of the virtual world economy, the number of electronic transactions will increase, which will need to be reliably reflected in accounting (Al Gnbri, 2021). As business operations in the meta-environment initially cause distrust among counterparties, there is also a need to audit control of IT companies' economic activities and confirm the reliability of reporting indicators of their functioning.

A variety of entities that have doubts about the integrity of the functioning of enterprises in the metaverse can be clients of the audit of virtual economic activity. There are some concerns regarding business cooperation as potential participants in the contractual relationship do not have the opportunity to personally visualize the company's assets, material samples, and products of its activities and do not have personal business meetings with officials. The reliability of the financial statements of IT companies is extremely difficult to verify in the metaverse. Therefore, the task of the audit in the meta-environment is to ensure trust in potential counterparties. Audit firms could act as guarantors of the reliability of information about IT companies and provide information for electronic transactions. Zadorozhnyi et al. (2018) provide more about the design of contractual relations between contractors in the information environment of business communications and the role of accounting and control.

Implementing accounting and auditing procedures in the meta-environment takes place remotely and without direct contact with the outsourcer. Initially, signing a smart contract with a virtual outsourcer is necessary to provide accounting services. After the electronic contractual relationship is established, the IT company provides access to the information system of economic activity, and the outsourcer ensures reliable and timely accounting with the necessary confidentiality. Every facet of the electronic transaction is automatically recorded by specialized accounting software. All credential processing operations could be delegated to a virtual outsourcer. In due time, the generalized arrays of reporting electronic information are sent to the controlling institutions and management of the IT enterprise.

Full-time accountants or outsourcers could perform their duties with maximum ergonomics. The use of virtual and augmented reality technologies provides the processing of accounting information in a graphical and dialog interface. The ergonomics of accounting are realized through the simplification of electronic communications between the participants of the metaverse to the level of interpersonal communication and the use of various visual images to display accounting information. As a result, the professional requirements of accounting specialists regarding the availability of skills to work with different software are reduced. Similarly, for other stakeholders who lack accounting knowledge, and management analysis, the accounting information could be displayed in graphs explaining the origin, calculation methods, and the value of indicators for effective management decisions.

Audit in the meta-environment involves implementing specific methods of controlling the economic activity of IT enterprises. First and foremost, auditors need to familiarize themselves with virtual assets, classify them, and verify them to reflect in the accounts. Each accounting object of innovative origin requires the study of the legal field of its positioning in the metaverse. However, it is important to study not only the national regulations of the country of entity registration in the field of IT but also compliance with the rules of the existence of a particular type of metaverse. The auditor’s task is to identify differences and harmonize regulations governing the activities of IT companies at the national and meta-environmental levels.

Accordingly, the audit activity of the IT company requires an audit of the legality of activities and compliance with all internal and external regulations. As the e-business environment has traditionally been focused on cybercriminals and criminals, the audit service is to confirm the legitimacy and integrity of economic activity in the metaverse. It is necessary to control the cybersecurity system of a virtual enterprise. Because all business processes are electronic, intensifying even minor cyber threats could lead to the suspension of IT enterprises and even their bankruptcy. Auditors could use testing of the cybersecurity system, surveys through electronic communications of participants in the metaverse, monitoring the content of information messages and communication style on social networks, etc.

Along with the control of cyber hygiene of IT employees, it is difficult to calculate and account for the salaries of specialists in the metaverse. The staff of the virtual enterprise should be divided similarly to the classification of employees of banking institutions into two groups: front office and back office. Front office workers could perform their duties only in the metaverse. According to the classical classification of activities,

such persons could be attributed to production workers. It could function only after entering the meta-environment through electronic communication channels. In turn, back-office workers could work outside of cyberspace. Their work is stable over time and irrelevant. Such employees should include general production and administrative staff. Accrual and accounting of wages should be differentiated for different groups of workers. Employees of the front office should be paid in proportion to the time spent in the meta-environment or the number of completed professional tasks with a piece-rate form of remuneration. Instead, it is advisable to keep track of the salaries of back-office employees on an hourly basis with a monthly salary. Differentiated remuneration of employees of IT enterprises in the meta-environment will contribute to the fair distribution of the salary budget and ensure the reliable determination of the cost of IT products (works, services). Effective payroll accounting is essential for the IT sector, where most of the costs are generated by the tangible work of employees. The main accounting object that needs to be audited in the meta-environment is NFT (non-fungible token). Unlike all cryptocurrencies, it is a special type of cryptocurrency that encodes and identifies a unique digital element (Akkus et al., 2022). In other words, NFT could represent any real object in a virtual environment. Examples of popular NFT objects are virtual real estate, images, animation, video, audio, document, event tickets, an object in a computer game, an Internet meme, or other objects that exist as a single sample (Table 2).

Table 2. Perspectives and problems of NFT application

Application		Problems	
Digital arts	Images, music, videos, installation, literature	Improper legal recognition	Lack of legal regulation
Digital twins	Virtual copies of real objects	Ensuring intellectual property rights	The creator may not be the owner of intellectual property rights
Clothes	Virtual characters' clothes	Cybersecurity	The virtual environment is the object of increased cyber vulnerabilities
Licenses and certificates	Right to use, right to perform any activity, proof of obtained knowledge and skills	Ensuring confidentiality	Difficulty in maintaining confidentiality compared to other cryptocurrencies
Collections	Collection of digital objects (memes, tweets, posts)	Concluding contracts	The complexity of the legal consolidation of the transfer of ownership
Digital potential growth	In-game items, space and features	Impact on the environment	Operation requires high electricity costs
Domain names	Domains and addresses of virtual environments	Ensuring trust	Public distrust of innovation and digital assets

Sources: developed by the authors.

From the point of view of accounting, NFT is close in legal and economic content to a digital work of art and defines a certain information record in the blockchain, which is a link to digital content. This intangible asset could be considered an asset because each NFT encodes a separate work of art, and its maintenance by an IT company involves promising economic benefits. Owning an NFT determines the owner's unconditional ownership of the digital object automatically. Another person could become the owner of NFT only because of the sale or free transfer, similar to what happens in the real physical world (non-electronic environment). The initial value of NFT in the metaverse is determined by its creator and then - based on a virtual contract of sale (smart contract) or auction between potential acquirers.

However, it should be noted that NFT exists as long as a certain metaverse supports the preservation of information about it (Osivand, 2021). In this case, the metaverse is an intermediary in the NFT cycle, similar to the principles of exchange platform operations. The main difference between NFT in the metaverse and the digital work of art is the impossibility of separating existence from the information environment of the mediator. The digital version of the work is controlled by the operator of the metaverse, where NFT is only an informational link to it. However, NFT ownership and other types of digital artwork are retained by the author or the copyright owner (Osivand, 2021).

Thus, it is advisable to impose legal obligations on the intermediary, which is a certain metaverse, to guarantee the NFT cycle. In addition, meta-environmental operators should be encouraged to form reserve funds to cover the possible bankruptcy of infrastructurally important participants in the metaverse. Such reserves could also be used for financial compensation to participants in the virtual universe in its termination.

For the same purpose, it is recommended to encourage operators of metaverses to freely move NFT between different meta-environments and convert them into freely convertible cryptocurrencies. In this case, IT companies can ensure liquidity and monetization of NFT, which is important for their recognition as assets in accounting. For accounting purposes, NFT should be classified into non-current and current assets by useful life. NFTs with an expected useful life of more than one year are non-current assets that should be reflected as intangible assets of the enterprise. NFT assets that fully transfer their value to the cost of IT products (works, services) created in the metaverse, consumed during the year, or lost consumer properties, should be recognized as current assets and reflected in current intangible assets.

Accounting for revenue from the sale of NFT is similar to the accounting method of reflecting the sale of other digital assets. The only difference is the need to give full legal force to concluded smart contracts exclusively in electronic form. They refuse to sign traditional sales contracts due to their absence in the meta-environment. It is possible to entrust the verification of the legal force and confirmation of the authenticity of concluded smart contracts under the rules of a specific metaverse to independent audit firms. The auditor may be the guarantor of the NFT alienation agreement in favour of the right holder. The metaverse also creates unique conditions for monitoring marketing expectations and preferences compared to traditional social networks. Promising opportunities for product promotion (works, services) as metaverse members together with information behaviour tracked by conservative Internet technologies, are carriers of visual and anthropogenic characteristics, gastronomic and cultural preferences, clothing aesthetics, and architectural or interior design (Hollensen et al., 2022).

For accounting and auditing control, it is advisable to distinguish between marketing activities and related costs according to the material form of assets. Expenditures on the promotion of tangible products (works, services) and intangible assets should be performed separately. If the sale of tangible products involves traditional and parallel virtual sales channels, the sale of intangible assets could take place exclusively in the metaverse (Taylor and Soneji, 2022). For example, the costs of sales of software products, IT services and works, character improvements and in-game monetary values in computer games, digital copies of works of art, etc., are significantly different in economic nature from conservative accounting objects. Separate accounting of sales costs of tangible and intangible origin contributes to the reliable definition of promotional activities and the planning of marketing budgets of enterprises. The company's management receives a multifaceted information resource to determine the effectiveness of virtual marketing using communication technologies. Figure 3 shows the generalized functional trends in the improvement of accounting and auditing in the metaverse.

Transformational trends in the structure of assets and liabilities inevitably lead to the removal of such reporting items of enterprises as fixed assets, non-current tangible assets, depreciation of fixed assets and non-current tangible assets, inventories, IBE, and others. At the same time, the share of intangible assets and goodwill of the company is growing significantly. Intangible assets in the balance of innovative IT companies simultaneously combine tools and objects of labour: licensing and legal system of operation, production infrastructure, ownership of software, copyright, etc. In other words, intangible assets form a unique ecosystem within the enterprise's information system, which integrates all the functional and production processes of IT entities.

However, the company’s goodwill is positioned as its market value, which is formed due to competitive advantages in the market. Goodwill economically reflects the uniqueness of the enterprise and the conditions of functioning of IT enterprises - their main business idea and strategy of its implementation. If in traditional industries goodwill is determined at the time of their market positioning or peer review, IT companies could identify goodwill at the start-up stage and attract initial investment. Consideration of start-up projects by venture funds or crowdfunding platforms involves a mandatory assessment of the viability of business ideas, which allows for determining the initial goodwill of enterprises. An IT company's initial market value will be the investment required to implement a startup. More about the impact of the use of information and communication technologies on the size of goodwill is revealed in our article (Zadorozhnyi et al., 2018).

As a result, implementing economic activity in the meta-environment inevitably leads to the growth of goodwill, which is a universal indicator of the company's value. The share of goodwill may predominate in the balance sheet structure of the metaverse's IT enterprises, which distinguishes them from those of all other sectors of the economy. Features of structuring the reporting of enterprises of the metaverse require further research.

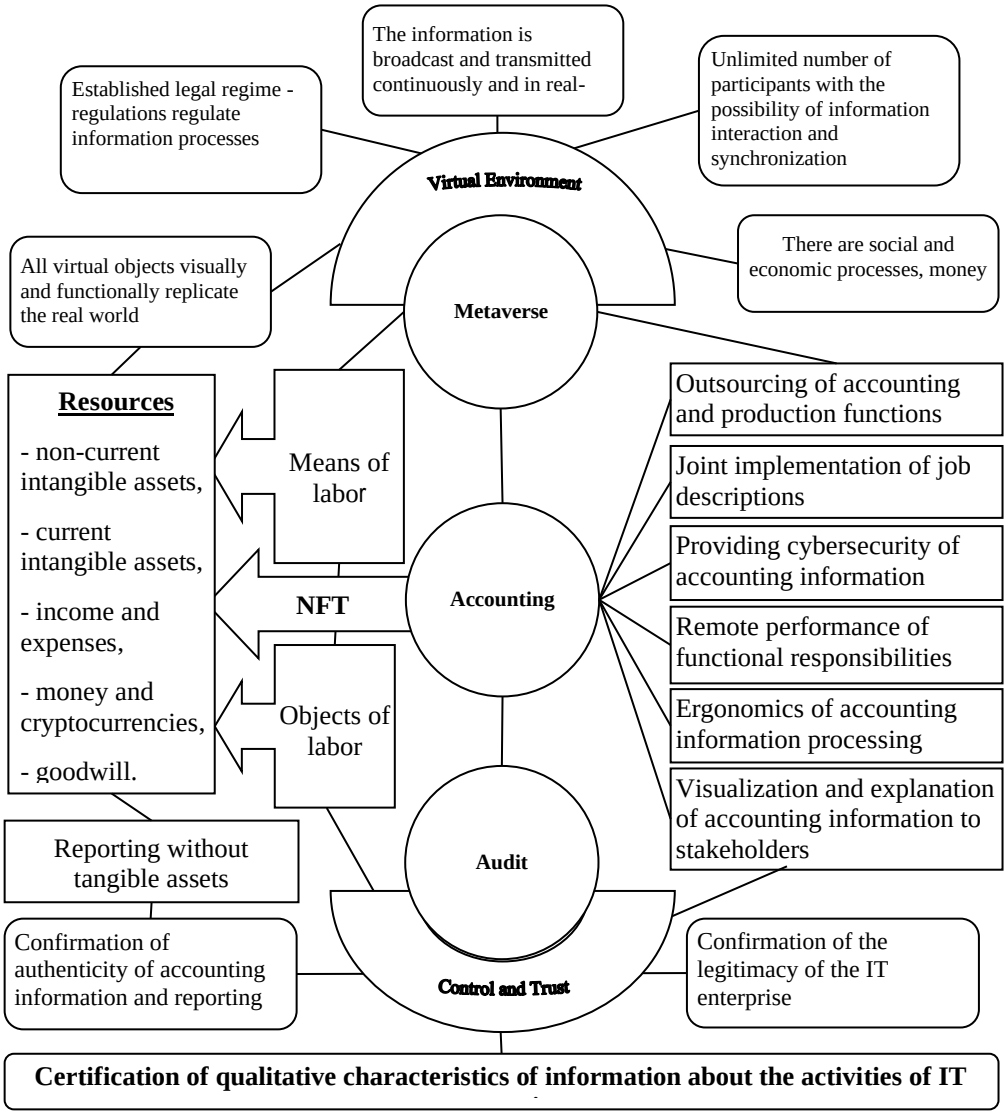

Figure 3. Information scheme of accounting and auditing of the metaverse resources

Sources: developed by the authors.

Conclusions. The latest stage in the development of information and communication technologies is marked by the formation of virtual electronic information environments - metaverses. Financial and economic activities in the meta-environment led to new accounting facilities, which require improvement of their accounting and auditing. The article systematizes the specific resources of the metaverse. The literature review made it possible to identify the resources of the metaverses (intangible assets, non-fungible tokens, goodwill, marketing expenses, and other objects that may occur in the meta-environment). The metaverse resources have been recognized as accounting objects. Their accounting and auditing have been improved for the first time in the scientific space.

For example, virtual real estate is an innovative asset that exists exclusively in the metaverse, which should be reflected in non-current intangible assets. Intangible real estate should be used for the virtual placement of accounting and auditing services. Given the significant public distrust and active threats (including fraud and cybercrime) in the digital business, it is necessary to ensure the reliability and integrity of information flow in the meta-environment, which is possible through audit control. It is also advisable to position the audit as a guarantor of the legitimacy of the metaverse based on verification of compliance with internal regulations of IT companies within the legal field of the virtual electronic information environment and the country in which it operates.

All tools and objects circulating in the meta-environment require accounting and auditing. It could be done in the form of NFT (non-fungible tokens). Although NFT is an informational record of a reference to the location of information about a virtual object, from the point of view of accounting and auditing could be

recognized as an asset due to its uniqueness and separation from other assets; opportunities for free purchase (sale) in the meta space, potential economic value in the case of retention and accumulation; reliable determination of value based on cost, sales contract or expert (market) assessment. NFT should be classified according to the criterion of useful life into non-current and current assets with the appropriate reflection in the composition of non-current intangible assets and current intangible assets. Additional usefulness of the meta-environment for e-business is the possibility of personalized marketing of products (goods, services), which requires separate accounting of costs of sales of tangible and intangible objects to ensure the reliability, analytical, and comparability of accounting information. The preparation of reporting information by members of the metaverse significantly transforms reporting in terms of increasing the share of intangible assets and the potential absence of any tangible assets in the full transfer of financial and economic activities in a virtual environment and remote performance of duties by employees working from home.

At the same time, insufficient development of meta-environments imposes the study's limitations on the empirical verification of the author's developments. Therefore, explaining the impact of the spread of metaverses on electronic socio-economic processes is problematic. International regulation of accounting and auditing in meta-environments and legal recognition of crypto-assets and NTFs as accounting objects require further research to improve the accounting and audit in the metaverse, which will contribute to the rapid implementation of virtual technologies in socio-economic processes.

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Інноваційний облік та аудит ресурсів метавсесвітів

Активне господарське використання віртуальних електронних інформаційних середовищ – метавсесвітів, є найбільш перспективним напрямком розвитку інноваційних інформаційно-комунікаційних технологій. Традиційні облікові об'єкти зазнають значних змін у метасередовищі унаслідок їхньої нематеріальної інтерпретації, що потребує удосконалення їхнього облікового та аудиторського відображення. Мета дослідження полягає в удосконаленні методики та організації обліку й аудиту в метавсесвіті щодо ідентифікації, визнання, відображення в обліковій системі необоротних нематеріальних активів, гудвілу IT-підприємств, NFT (невзаємозамінних токенів), криптоактивів, збутових витрат та інших об'єктів, які можуть виникати у метасередовищі. Для досягнення поставленої мети було застосовано системний, інноваційний, інституційний підходи та методи економіко-математичного моделювання, бібліографічного та компаративного аналізу. Зважаючи на значну недовіру громадськості та активні загрози у цифровому бізнесі, авторами обґрунтовано необхідність запровадження аудиту у метавсесвіті для забезпечення достовірності, доброчесності та легітимності інформаційних потоків. У ході роботи досліджено: можливість визнання з позиції обліку й аудиту усіх віртуальних засобів та предметів праці, які здійснюють колообіг у метасередовищі у формі NFT, активами унаслідок: унікальності і відокремленості від інших облікових об'єктів; можливості вільної купівлі (продажу) у метапросторі, потенційної економічної цінності у випадку утримання та накопичення; достовірного визначення вартості на основі калькулювання собівартості, договору купівлі-продажу чи експертної (ринкової) оцінки. За критерієм тривалості корисного використання, авторами запропоновано класифікувати NFT на необоротні та оборотні об'єкти з відповідним відображенням у складі необоротних нематеріальних активів та оборотних нематеріальних активів. Визначено перспективність персоніфікованого маркетингового просування продукції (товарів, послуг) у метавсесвіті з відокремленим обліком витрат на збут матеріальних і нематеріальних об'єктів для забезпечення достовірності, аналітичності та порівнюваності облікової інформації. Як підсумок, сформовано висновок про доцільність трансформації структури звітності підприємств метасередовищ у частині збільшення частки нематеріальних активів та потенційної відсутності будь-яких матеріальних активів в умовах повного переведення фінансово-господарської діяльності у віртуальне середовище. Подальших досліджень потребує порядок структурування звітності підприємств метавсесвіту.

Ключові слова: облік, аудит, нематеріальні активи, NFT, метавсесвіт, ресурси, віртуальне цифрове інформаційне середовище, IT-підприємства.