Metaverse Technology Integration Transforms Financial Reporting Quality in Accounting Systems

Integrasi Teknologi Metaverse Meningkatkan Kualitas Pelaporan Keuangan dalam Sistem Akuntansi

Jinan Abed Khaji [1*]

[1] *Department of Accounting, College of Administration and Economics, University of Karbala, Iraq*

Abstract. The development of extended reality technology, especially metaverse technology all over the globe has brought about interactive digital space that is transforming the way users interact with information. Following this paradigm shift, there has been an increasing need to study the effect of the introduction of the metaverse technology into accounting information systems on the quality of the financial reporting environment, which is a key tool in supporting the decision-making process, improving transparency, and meeting the requirements of the regulatory environment. The proposed work is aimed at analytically assessing the outcomes of implementing the metaverse technology into the accounting information system on the financial reporting environment based on the empirical field study carried out on a group of public and private banks within the Karbala Governorate. The study follows a descriptive and analytical paradigm and involves a questionnaire with two major dimensions: the first determines the level of awareness and usage of metaverse technologies in accounting systems and the second one measures the features of the financial reporting environment based on accuracy, transparency, interactivity, and disclosure quality. The questionnaire was administered to a sample of 71 participants that have been hired to work in the banking industry, and the obtained data were analyzed using the proper statistical procedures to prove the hypotheses proposed. The initial evidence shows growing consciousness of the importance of metaverse technologies as a system that facilitates accounting, and the availability of scalable initial technical infrastructure as well. Moreover, the findings indicate that the introduction of metaverse technology has a positive effect on improving the visualization of financial information, increasing user interaction, minimizing mistakes, and enhancing internal control. The research proposes the implementation of a combined digital approach to allow the activation of metaverse technologies in the accounting systems and the growth of employee skills needed to address the requirements of the new digital reality.

Keywords : Metaverse Technologies, Accounting Information Systems, Financial Reporting, Virtual Reality, Augmented Reality, Transparency, Interactivity

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*Correspondence:
Jinan Abed Khaji
jinan.abed@uokerbala.edu.iq

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Introduction

The last ten years have seen unprecedented digital revolution in the world which have forced organizations to re-configure their technical architecture, information systems, and the way of how financial data has to be presented. Due to the appearance of the extended reality and metaverse technologies, accounting information systems are now not only the tools of capturing transactions. They have become interactive platforms and have enabled decision-making, transparency and quality of financial reporting.

One of the most dominant technologies, which are recently introduced into the accounting applications, are called metaverses a three-dimensional digital world of implementation of virtual and augmented reality technologies. This is a timely trend in organizations that hope to be excellent in financial disclosure, internal control, and stakeholder engagement.

Financial reporting environment in this case forms a very important part of the accounting system as it records the results of the financial activities and relays the information to the internal and external users. This environment has shifted to the old paper-based models to the digital platform based on interactive dashboards, dynamic charts, and adjustable reports. However, there is still a knowledge gap on how much the application of metaverse technologies in accounting information systems can improve this environment regarding transparency, accuracy, interactivity, and quality of disclosure.

The investigation of this issue is a scientific and professional necessity, as the organizations become increasingly interested in implementing extended reality technologies, those who want to improve the financial user experience, and develop disclosure tools that meet the needs of the digital age. In addition, the accounting literature lacks a sufficient number of studies on this sort of technical integration, particularly in the Arab environment, which highlights the need of systematic studies that can be used to assess the connection between the metaverse integration and the quality of the financial reporting environment.

In this regard, the use of metaverse technologies in accounting information systems is the basis of the main hypothesis of this research, as it is expected to lead to the enhancement of the quality of the financial reporting environment, in terms of transparency, accuracy, interactivity, and quality of disclosure. It will be able to test this hypothesis by using both quantitative and qualitative measurement tools and measures that include perceptions, applications, challenges, and expected results that will lead to the formulation of a conceptual model that will direct organizations towards the successful adoption of these technologies.

Research Problem

Considering the current pace of digital change gaining momentum all over the globe, accounting and financial institutions begin to consider new technologies, namely extended reality and metaverses, due to their ability to transform work environments, especially in the context of the accounting information systems industry. Though the fields like education, design and e-commerce are already

utilizing these technologies, their use in accounting is still in the early stages and is negated by the lack of systematic evaluation models that will be able to prove its impact on the quality of the financial reporting.

The research problem is formulated as a significant gap in knowledge in the literature on the topic of the nexus of the use of metaverse technologies in accounting information systems and the improvement of the financial reporting environment. Even though there are few studies dealing with the fact that the extended reality can enhance interactivity and transparency, these studies remain mostly theoretical or are not quantitatively supported. Besides, existing models often do not take accounting privacy into account and do not provide a realistic framework explaining how metaverses can alter the display and analysis of financial statements. This creates a strong form of urgency to have a scientific study that fills this gap and is stringent in assessing the impact of the incorporation of metaverses into accounting information systems on the financial reporting environment in the form of metrics like quality of disclosure, quality of the data, interactivity and understanding of the system by the user. This issue presupposes the increased salience in the Arab case, where, in the digital transformation institutions, the institutions are still learning how to walk the path of digital technology and need the empirically backed instructions of moving to an effective and safe technology. Therefore, the main question of this study will be:

How far can implementation of metaverse technologies in accounting information systems help to enhance financial reporting landscape on transparency, accuracy, interactivity, and the quality of disclosure?

Significance of the Research

The relevance of the current research is based on the exploration of modern convergence of improved technology and accounting practices, which to this day, has not been fully explored both in the Arab and world. The lessons learned during this study may contribute to the development of more dynamic financial disclosure systems and help organizations to implement new digital solutions.

The importance of the work can be outlined as follows:

1. It clarifies how metaverses can be applied to accounting, thus bringing it to a relatively new line of investigation.

2. It helps it form a financial reporting environment closer to the needs of the digital era.

3. It provides the decision-makers in organizations with a more accurate view of the viability of the investments in extended reality technologies.

4. It supplements the scientific knowledge regarding accounting information systems and new technologies.

Research Objectives

In light of the presented problem and its anticipated importance, this research seeks to achieve a set of objectives covering both theoretical and practical aspects. These objectives form the framework that guides the data collection and analysis process. The research objectives can be summarized as follows:

1. Analyze the concept of metaverses and identify their technical characteristics relevant to accounting.

2. Study the extent to which accounting information systems can integrate extended reality technologies.

3. Measure the impact of metaverse integration on the quality of financial reporting in terms of transparency, accuracy, and interactivity.

4. Propose a conceptual model that clarifies the mechanisms for integration between metaverses and accounting information systems.

5 .Explore the organizational and technical challenges that may hinder the application of this technology in the reporting environment.

Research Hypotheses

Scientific hypotheses are a methodological tool for examining the relationship between variables. They are built on a theoretical and empirical foundation. In this study, based on the research problem, the hypothesis is formulated to test the impact of integrating metaverses on the financial reporting environment. Accordingly, the main hypothesis of the study is as follows:

"There is a statistically significant positive effect of integrating metaverse technologies into accounting information systems on improving the financial reporting environment in terms of transparency, accuracy, interactivity, and disclosure quality".

Research Limits

The research limits are among the essential methodological elements that define the scope of the study, contribute to controlling variables, and interpret the results within their real-world context. Since this research is field-based, it covers a group of private and public banks in Karbala Governorate, and the temporal, spatial, and thematic limits are formulated as follows:

1. Temporal Limits: The research covers the period from the beginning of June 2025 to the end of August of the same year.
2. Spatial Limits: The research is conducted in Karbala Governorate, specifically within a selected group of public and private banks, enabling comparison between different organizational models within a single financial environment.

Methodology

This research has as its basis an empirical field study to evaluate the effects of metaverse technologies on the financial reporting environment of accounting information systems. This is a descriptive and analytical study, both qualitative and quantitative methods are used in this study. The questionnaire developed in this research is based on two dimensions, the first dimension examines the awareness of usage of metaverse technologies on accounting systems (e.g., an awareness of metaverse technologies on accounting systems), while the second assesses financial reporting environment characteristics such as accuracy, transparency, interactivity and disclosure quality. The questionnaire was distributed

among 71 sample individuals, consisting of staff from both public and private banks in Karbala Governorate. Participants were chosen based on their vast knowledge in the banking sector, who allowed us to obtain a diversified view about the infusion of metaverse technologies. The data collected from the survey were analysed—using statistical techniques, such as correlation analysis, regression modelling, and variance analysis—against the hypotheses to measure the effects of metaverse technologies on the financial reporting environment. It also investigates the technical and organizational barriers that organizations encounter when trying to adopt metaverse technologies with ease. This means that the results were compared between banking organizational models, which gave additional information about the degree of adoption and the impact on financial reporting practices. The research methodological approach seeks to fill a gap in the literature that has a dearth of understanding regarding how metaverse technologies in accounting information systems are implemented and the benefits they provide in the preparation of financial reporting.

Theoretical Framework for the Study

History of the Evolution of the Term Metaverse

The term "metavers" first appeared in Neal Stephenson's 1995 science fiction novel "Snow Crash." It represented a parallel virtual reality world, designed using computer graphics, accessible and interacted with by users from all over the world via glasses and headphones. Although Stephenson's "metavers" are digital and artificial, the experiences within them can have a real impact on the physical self. The OASIS is a modern literary incarnation of metaverses, embodied in the 2011 science fiction novel Ready Player One by Ernest Cline. OASIS is a massively multiplayer online virtual reality game that has evolved into a major online destination for work, education, and entertainment. It features an open game world and a collection of virtual planets. Users connect to the OASIS using headsets, haptic gloves, and a suit [1].

The Concept of Metaverses

As a result of innovations in information and communications technology, today's world of business and finance is evolving at a rapid pace that is sometimes difficult to keep up with and absorb. At the same time, the world is still trying to adapt to the products of the Third Industrial Revolution, at its peak, and to accommodate social media and the cultural, political, economic, and social changes it has brought. The World Economic Forum announced several integrated technologies with enormous potential in Davos, Switzerland, in 2016, under the banner of the Fourth Industrial Revolution. These technologies have infiltrated almost every field, sparking the curiosity and enthusiasm of many organizations and individuals. Research and exploration continued at a moderate pace until 2020, when the COVID-19 virus spread across the world, leading to everyone being isolated in their homes. During that period, these technologies received significant attention, as they contributed to maintaining the vitality and continuity of the world in general, and the world of finance and business in particular.

Their reliance on them also enhanced the performance of remote work [2]. The metaverse is a compounded digital realm that combines various technologies and, therefore, transforms the modes in which human beings engage with information. It provides a very rich virtual space simulating the real world and with interactive digital content, thereby providing new ways of interaction and data representation. There are three main elements that form the technical architecture of the metaverse that are collectively referred to as extended reality technologies: virtual reality (VR), augmented reality (AR), and mixed reality (MR). Virtual reality is related to the creation of entirely immersive computer-generated worlds, normally realized by devices like head-mounted displays or smart glasses. In the accounting field, VR can be utilized to either render three dimensional models of financial objects or to model accounting processes within a virtual environment. In contrast, augmented reality is digital information overlaid on the physical space, such as by showing financial information over paper and including graphical displays as part of face-to-face interaction. This augmentation maximizes the understanding of financial interrelationships and no departure to the real world is needed. Mixed reality is a form of interactive merging of real and virtual worlds, where the user is able to interact with computerized objects in a physical environment, as an example, checking your financial statements at a conference table on 3D interfaces.These factors form the basic technical scaffold of metaverses, thus, allowing uninvented possibilities of the visualization and study of accounting data. As a result, they help to improve the financial reporting setting with regard to interactivity, accuracy, and transparency and restructure the interface between users and accounting systems in the new digital age [3]. Mystakidis poses a question here: Why do we need accounting in the virtual metaverse? To answer this question, historically, the need for accounting arose from the existence of economic exchange and barter between people, which still exists in the metaverse, where one user can buy or sell digital assets to another. Given the existence of economic exchange, accounting will need to protect scarce and limited resources and ensure their optimal use. In this regard, some argue that the metaverse has its own virtual economy, based on the same concept of scarcity as the real-world economy, meaning that the metaverse needs an accounting profession. From another perspective, it could be argued that the structure of the virtual world makes it unsuitable for scarcity-based economies, and that replicating the real-world economy is not the optimal solution in the metaverse. It is worth noting that accounting information systems (and accounting in general) will not change their objectives in the metaverse, but rather how they are achieved, which will be reflected in the functions of these systems: accounting measurement and disclosure. Therefore, it can be said that there will be two accounting units: one in the metaverse and one in the real world. The metaverse has its own economy, known as the token economy. This economy is primarily based on non-fungible tokens (NFTs). In this economy, new forms of trust are available to prove and record ownership of assets through tokens. Each digital asset is given a unique digital token (as in smart contracts), and each physical asset is given a digital

token representing it, known as a token. NFTs are a type of digital object, which are independent, with an intrinsic value and capable of management, sale, and ownership.

Metaverse Technologies

The metaverse is a compound combination of the latest technologies, which form a virtual environment in a synergistic way, allowing interaction with the user, work activities, and entertainment. The fundamental technologies that the metaverse is built on are summarized as follows [4]:

1. VR and AR Virtual Reality (VR) and Augmented Reality (AR): The VR and AR technologies form the base of the metaverse. VR creates the completely realistic virtual environments, and AR imposes on the real world digital artefacts, so it allows the users to manipulate virtual objects and spatial structures.

2. Blockchain: blockchain is a distributed ledger technology that is the economic foundation of the metaverse. It allows the creation and safe management of non-fungible digital assets, including non-fungible tokens (NFTs), offers reliable payment systems, and offers reliable virtual markets and virtual environments.

3. Artificial Intelligence (AI): Artificial intelligence is essential in the personalization of the user experience in the metaverse. Robots are used to create customised content based on user behaviour and virtual characters are created with AI which increase realism and interactivity [5].

4. 3D Reconstruction: It is a technology that can be used to create very realistic virtual environments through digitized reconstruction of real-world objects and spaces with 3D scanning, and modeling software.

5. Internet of Things (IoT): The IoT is a network of physical devices connected to the internet, thus increasing the interaction in the metaverse. Indicatively, through virtual-reality headsets a user can manage the devices of a smart-home within a virtual environment.

6. Cloud Computing: Cloud computing offers the scalability needed in order to allow the users to access the metaverse using any device. It is also used in processing large volumes of data required to create realistic virtual worlds.

7. 5G and 6G Networks: The high-speed networks provide the bandwidth and low-latency features needed to create a smooth experience with virtual and augmented reality, and, therefore, facilitate instant interactions across the metaverse.

8. Game Engines: Game engines are also used to create interactive 3D worlds and the animated characters thus allowing developers to create the complex and intriguing virtual worlds.

Metaverse Applications

As a paradigm of the future, metaverses have the potential elements of radically change various spheres of everyday life. The given three-dimensional virtual space allows users to do not only interact with each other and conduct professional activities but also recreational and even live in digital avatars [6].

1. Education: The metaverses can revolutionize the pedagogical processes by providing immersive virtual classrooms. Students are given a chance to interact with other students all over the world, to question complicated scientific and historical ideas and enjoy realism in simulations that enrich their cognitive framework and improve their overall performance in learning.

2. Business: Metaverses open up new business opportunities to enterprises and include virtual exhibits, interactive customer interactions, as well as business meetings distributed geographically. The organizations are able to easily integrate with their colleagues, as well as clients regardless of geographical location, which simplifies cooperation with them, and increases the market scope.

3. Entertainment and Gaming: In the gaming industry, the metaverse has a huge potential that will provide incredibly interactive and immersive experiences through virtual and augmented reality applications. It also doubles up as an arena of socialization, concerts and expos thus expanding the culture and entertainment front.

4. Health and Medicine: Healthcare Applications Medical education, remote surgery, patient consultation, and psychotherapy have medical applications. The metaverse will provide continuity of care and patient empowerment as patients can engage with clinicians and peer support networks and have access to a curated repository of health resources in the metaverse.

5. Real Estate: Virtual worlds may change the real estate business entirely because users can buy virtual pieces of land, build digital houses, and sell virtual homes. This ability will enable potential customers to study interior and exterior designs virtually before making a transaction commitment, which improves the decision-making process.

6. Art and Culture: Artists gain the opportunity to use the metaverse as a platform to create virtual galleries, sell their art, and communicate with their fans. The site will also serve as a cultural and artistic venue and will, therefore, promote access and cultural distribution.

7. Socializing: The metaverse offers a new social environment, which can be used to connect with friends and family, facilitate the activities of groups and forums, and organize events, thus making the community interaction richer.

Applications of Metaverses in Accounting

The emergence of metaverses is a groundbreaking move in the convergence of the human and digital interaction, which poses significant opportunities to the accounting profession. Making use of virtual reality, augmented reality, and the internet, these technologies help to build the three-dimensional environment of interaction that simplifies the accounting process in creative and highly efficient ways [7].

1. Engaging and Interactive Training: With the help of metaverses, it is possible to organize virtual classrooms and training workshops that are interactive. These

platforms can help the accountants present complex accounting concepts in an interactive and visual manner, which helps the trainees to understand. The fact that the simulation of accounting work settings is realistic allows trainees to practise and train their skills in a controlled setting, hence the addition of practical experience.

2. Increased Cooperation and interaction: As a collaborative platform, metaverses enable real-time communication and proper interaction between accountants, auditors, and stakeholders. The virtual meetings, interactive presentations, and remote audits could be easily found in the metaverse environment. These abilities make the work more productive, minimize the travel costs, and improve the quality of decision-making.

3. The incumbent analysis and visualization of advanced data have been developed by the company. The company has developed the advanced data visualization and analysis. Metaverses can improve the visualization of data since they allow visualizing financial data in a graphical and three-dimensional format. This helps accountants identify and analyse complicated patterns and trends. In addition, the use of augmented-reality tools could incorporate financial information in the real world, to get more insights into the financial position of an organization.

4. Automation of the process and minimization of errors: Many accounting tasks, such as data recording of transactions, reporting, and data reconciliation, will be automated with the help of artificial-intelligence tools used in metaverses. By automating, human error is reduced, more and high quality work are done faster, and accountants are able to concentrate their efforts on more valuable and advanced work.

5. Creating new client experiences involves establishing a new service experience that delivers a fresh impression of the client. Creating New Client Experiences: This is the creation of a new service experience that creates a new impression of the client.

Metaverses facilitate accounting services in terms of personalization and interactivity. Customers can come to the office of an accountant in the form of avatars and receive advice in real-time. Moreover, virtual showrooms may be created on metaverses and offer clients interactive dashboards, which will increase customer engagement and satisfaction.

6. The creation of New ways of running Business.

Metaverse provides new possibilities in creating new business models in accounting. As an example, accountants can provide virtual financial advice, specialised education courses and on-line platforms to trade in digital assets. These innovations have the potential of expanding the horizons of accounting services.

7. Improving Data Security: Blockchain and encryption technologies can make the metaverse tighten the security of financial information. These tools would take care of the sensitive information being stored and passed in a safe way thus protecting the information against unauthorized access.

Metaverse Technologies in Accounting Information Systems

Metaverse technologies become an outstanding example of digital transformation which is significantly influencing the accounting information systems architecture. Extended reality environments can offer new visualization of financial data and allow users to experience accounting reports in a three-dimensional environment, which improves the quality of decisions and reinvents the accounting user experience. Metaverses represent the conceptual change within the domain of internet applications, and it is expected to have sweeping impact on the financial reporting, auditing, and accounting education with the assistance of technologies like artificial intelligence, blockchain, and virtual reality. In this online interaction environment, accountants have the opportunity to model financial transactions and build virtual models of economic actors and, therefore, improve reporting accuracy and transparency [8].

In its turn, Alsartawi & Hussainey have placed the strategic importance of metaverses on accounting information systems in the spotlight, as these technologies are expected to transform the nature of how accounting information is accessed and managed, and provide the means to develop interactive interfaces driven by augmented reality technologies, which will help improve the efficiency of the accounting profession and change its sustainability in the context of the active technological changes. The introduction of metaverses into the accounting information system also opens new prospects in the field of internal auditing through the creation of virtual environments in which financial transactions can be tracked in real time and risks are more dynamic and interactive analyzed. The changes bring about the obligation to the accountants and auditors to adjust to new digital environments that require new technical and analytical skills. They also open new vistas of the study of the design and testing of accounting information systems in the environment of metaverses, such as analysis of the influence of such a setting on the quality of financial reporting, efficiency of internal control, and feasibility of conventional accounting standards in a virtual world.

Financial Reporting Environment

The Concept and Importance of the Financial Reporting Environment

The financial reporting environment is the institutional, technical and organizational context in which the financial information is prepared and presented to the internal and external stakeholders, including investors, auditors, and regulatory agencies. It also includes accounting policies, information systems, disclosure standards and the technologies used to transmit data. In the modern context, this environment does not confine to paper documents or fixed reports but instead uses interactive digital platforms, which are capable of combining financial and non-financial data and thus making them more transparent and accountable. Financial reporting environment has been theoryed as a dynamic system where financial disclosure engages organisational technology thus reforming the relationship between the financiers and users of financial information. This conceptualisation can help highlight the influence of contextual factors on the production of reports and

indicate how the environment around the company can influence the quality and efficiency of financial disclosure [9].

Financial reporting environment is a critical component of organisational decision making since it provides accurate and reliable information that helps in reviewing the financial performance, identifying risks, and providing investment advice. It also serves to give the stakeholder confidence, enhance market efficiency, and the gap in information between the management and external users. Considering the developments in economics and technology, the quality of the financial reporting environment is one of the factors to evaluate the commitment of an organisation to governance and transparency. Companies investing in development of their financial reporting environment will have better performance in the market and will have higher ability to attract investors, especially those who include forecast information and advanced financial analysis in the report. The financial reporting environment is not limited to the financial perspective but also to the strategic perspective because reports are used as a tool of a continuous planning and appraisal [10].

The characteristics of an effective financial reporting environment

include a number of key characteristics first among which is consistency of the information presentation, reliability of the information and its understandability by users who are not specialists and in time. The implementation of the interactive presentation technologies, including the use of digital dashboards and dynamic charts, will help to improve the user experience and increase the abilities of reports to deliver the financial message in a clear manner. Companies resorting to the latest digital presentation tools are more likely to reach a higher level of disclosure, decrease informational distance between the management and the investors, and consequently establish a stronger relationship between the two organisations. Another modern characteristic is the ability to customize, i.e. users can choose particular data variables to be displayed; this customization contributes to the increased report effectiveness [11].

On the other hand, despite the immense progress that has transformed the landscape in the financial reporting, the environment is faced with a plethora of complicated issues. They are the complexity of international accounting standards, technical abilities of different institutions, the current cybersecurity threats, and the challenge of integrating non-financial information including sustainability and governance indicators in financial reports. Furthermore, the increasing use of the artificial intelligence and predictive analytics requires the strong infrastructural basis, specific training, and the clear data-governance provisions. Companies that do not match the technological advancement may lose control of the quality of the received reports, and thus lose their reputation in the market [12]. Such regulatory exigencies as changing disclosure requirements by regulators add further burdens and are the reason to design reporting systems flexibly.

Modern Trends in the Financial Reporting Environment

The digital age of financial reporting is fundamentally changing due to the rapid technological changes, the most notable ones being metaverses, artificial intelligence, blockchain technology, and interactive disclosure models. Extended Reality (ER) has become a means of changing the way financial data are presented and thus users can interact with financial statements in a three-dimensional virtual environment, which allows them to better understand financial relationships and makes it easier to make decisions. The reporting process, the discovery of latent patterns, and forecasting of financial outcomes are also added to AI and positively influence the quality of disclosure and the error reduction. The blockchain technology gives final records of financial transaction in real time, which enhances reliability of data and eases internal and external audit. Similarly, companies started to resort to interactive disclosure models that are grounded on digital dashboards that refresh as the users need them and enable users to personalize the information presented to them based on their requirements, hence making reports much more personal and enhancing their usefulness in decision-making. These non-divergent trends are reworking the financial reporting landscape to turn it into an interactive, analytic and forecasting platform rather than a medium of data transmission. That requires the formulation of new standards that can go together with this new digital reality [13].

Implication of Introducing Metaverse Technologies into Accounting Information Systems on the Financial Reporting Landscape.

The implementation of metaverse technologies in accounting information systems is a qualitative shift in the changes in the financial reporting environment. Such a convergence transforms the production and the delivery of financial information in that it creates virtual spaces that are interactive and simulate the reality in that they provide the user with an immersive analytical view of accounting information. In this context, the organization will be able to build three-dimensional digital representations of economic units, which will present the financial statements in real-time and in visual form. These representations allow better understanding of complex financial interrelations thus allowing investors, auditors and other external users to understand reports without requiring specialized accounting skills. The interactive environment, in its turn, enhances the quality of financial disclosure because users can browse through the reports, choose their favorite indicators, and associate them with the operational or strategic context of the entity. Furthermore, metaverses also have advanced internal-control options: internal auditors are able to interact with financial processes in a virtual world that replicates the real accounting system, thus tracking transactions, detecting deviations or other operational risks on time, and, therefore, enhancing audit efficiency. This real-time communication reduces the use of sampling or regular check-ups and contributes to the creation of a more flexible and reactive control mechanism. Lastly, metaverses can be used to make reports more customizable; display interfaces can be tailored to suit the interests of particular users, e.g., investors focusing on profitability metrics, regulatory

bodies focusing on compliance, or executive management focusing on operational performance. From a strategic perspective, this integration enhances organizations' ability to construct predictive financial reports, combining historical data with future simulation models within the metaverse environment. This contributes to supporting long-term decision-making and evaluating potential scenarios based on market variables or internal performance. The study confirmed that this transformation redefines the function of financial reports, transforming them from a mere means of transmitting data into an interactive analytical platform that contributes to building a competitive advantage for the organization [14] [15].

Practical aspect of research

After we touched on the concept of metavers in accounting information systems and pointed to their techniques and applications in general and with regard to the accounting aspect, as well as the matter after noting their impact on improving the financial reporting environment, it became necessary to work on the application of what was proposed in the research methodology and the theoretical side to reach the proof of the hypothesis of research or negation as well as work to achieve the goals of research, and for this the banking sector in the province of Karbala was chosen as a research community because of the great dependence of this sector on modern technology, as the research questionnaire was distributed to a sample of 71 employees in a group of government banks represented by the banks (Al-Rasheed and Rafidain) and private banks represented by the Bank (Islamic Spectrum).

And based on the answers of the sample members, the appropriate statistical analyses will be conducted using a set of statistical methods in order to test the hypotheses and ensure the extent of their achievement in the field, leading to results that can contribute to enriching the scientific and practical aspect of the subject of the study, as follows:

First: Stability factor: Before conducting research and testing hypotheses, it is necessary to ensure the reliability of the measuring instrument used, as the reliability reflects the degree of stability of the measuring instrument.

And it means the extent to which the measurement phrases are characterized by internal consistency, and there are several measures to test the internal stability, the most important of which is the Cronbachs alpha coefficient. From **Table (1)** above, the data are stable through split-half reliability, and the dimensions of all axes exceed 0.60, indicating their stability. Researcher's hypothesis: Metaverse technology in accounting information systems has an impact on the financial reporting environment .The value of this coefficient was calculated for all axes, and it amounted to (963.0), and since the value extracted is greater than (0.60), this is evidence of the stability of the measurement tool, and the higher this value, the more stability we obtain, and we can calculate this coefficient for each axis as follows:

Table (1) Reliability Coefficient

split-half reliability	Number of items	Dimensions
.984	10	Metaverse technique in accounting

		information systems
.992	10	Financial reporting environment
.991	20	Total

From **Table (2)** above Model Summary shows that the value of the coefficient of determination R Square (metavers technology in accounting information systems, financial reporting environment) reached (0.969), meaning that the percentage of explaining the financial reporting environment reached 96.9 based on the metavers technology in accounting information systems. The same is the case for the corrected coefficient of determination Adj R Square, and the value of the Pearson correlation coefficient (R) reached (0.984), meaning the presence of a strong direct correlation. The value of Std. Error of the Estimate reached (0.773).

Table (2) Correlation and explanation ratio between (metavers technology in accounting information systems, financial reporting environment)

Table (3) above shows significant differences between the studied variables based on Fisher's (F) measure, with the significance level (Sig) being less than (0.05). This means that the calculated (F) value (2167.851) is greater than the tabular value. This indicates the suitability of the model to test the hypothesis, i.e., there is a significant relationship between metaverse technology in accounting information systems and the financial reporting environment.

Table (3) Analysis of variance between variables

From **Table (4)** above, we can see the values of the regression coefficients, where the value of the constant (Constant) reached (5.876) and the value of B_1 equals (0.929), which is called the slope of the regression, meaning that whenever the variable metavers technology in accounting information systems changes by one unit, the financial reporting environment will increase by (0.929), meaning that there is a direct influence relationship between metavers technology in accounting information systems and the financial reporting environment. We also notice through the (t) test that there is an influence between metavers technology in accounting information systems and the financial reporting environment, where the value reached (Sig=0.00), which is less than the assumed value (0.05), and this confirms the validity of the hypothesis that states that there is an influence of metavers technology in accounting information systems on the financial reporting environment.

Table (4) shows the impact of the independent variable, metaverse technology in accounting information systems, on the financial reporting environment

The Figure 1 above shows that the majority of the data falls below the normal distribution curve, which proves that the residuals follow the normal distribution.

$$y = 5.876 + 0.929x \qquad \ldots.(3\text{-}1)$$

Figure (1). Regression standardized residual

Figure (2) above shows the proximity of observations to the regression line, i.e., the difference between actual and expected observations according to the above equation.

Figure 2. Normal P-P Plot regression standardized residual

Conclusions and Recommendations

A. Conclusions

The research reached several conclusions, the most prominent of which are:

1. Enhancing visual understanding of financial information: Metaverse technologies demonstrated a high ability to transform abstract accounting data into interactive three-dimensional models, which contributed to improving users' understanding of financial reports.
2. Withdrawing credibility and transparency: Virtual reality environments help to make the presentation of financial operations simple and direct and thus give the stakeholders a stronger feeling that the information shown to them is true
3. Improving the effectiveness of financial decision-making: with the help of metaverse platforms, users can simulate various financial conditions, which will help assess alternatives and make more informed decisions
4. Enabling real-time multi-party communication: metaverse technologies can give the accountant, managers, and auditors the ability to interact in real-time in a common virtual environment so that the understanding gaps can be minimized and the review and analysis processes can be accelerated.

B. Recommendations

Based on the findings, the researcher recommends the following.

1. The creation of the digital infrastructure of the accounting institutions: It is suggested that the accounting information systems should be modernized so that they were compatible with virtual reality technologies that provide support to the interactive graphics and 3D interfaces.
2. .Integrating metaverses into the accounting education and training programs: Academic institutions and professional organizations must include the ideas of metaverses and methods in the curriculum of the accounting and auditors training and preparation programs.
3. .Creating regulatory and legislative guidelines on how to use metaverses in financial reporting: It has been suggested that a regulatory framework be established to help in ensuring that these technologies are safely used and to establish the roles of different parties within a virtual reporting system.
4. .Promoting the further research in the field of accounting usage of metaverses: They should be encouraged to conduct further research in order to determine how metaverses affect the quality of financial reporting, audit effectiveness, and investor behavior.

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TABLE 2. Correlation and explanation ratio between (metavers technology in accounting information systems, financial reporting environment)

Model Summary[b]				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.984[a]	.969	.969	.773
a. Predictors: (Constant), x				
b. Dependent Variable: y				

TABLE 3. Analysis of variance between variables

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1296.727	1	1296.727	2167.851	.000[b]
	Residual	41.273	69	.598		
	Total	1338.000	70			
a. Dependent Variable: y						
b. Predictors: (Constant), x						

TABLE 4. shows the impact of the independent variable, metaverse technology in accounting information systems, on the financial reporting environment

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.876	.824		7.132	.000
	x	.929	.020	.984	46.560	.000
a. Dependent Variable: y						

FIGURE 1. Regression standardized residual

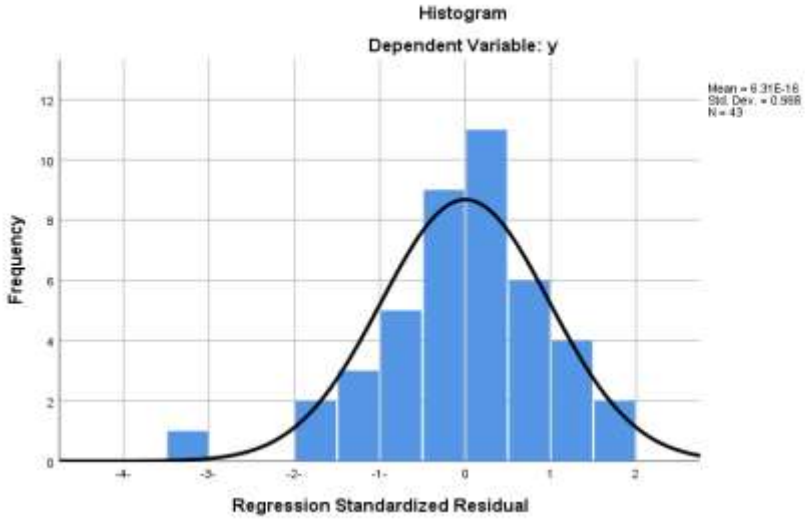

FIGURE 2. Normal P-P Plot regression standardized residual