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The impact of metaverse technology on the quality of cost and management accountants' performance: an analytical study of the opinions of an academician

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Abstract
The research was focused to identify the moderating effect of implementing metaverse technology in business settings on the performance of cost and managerial accountants and in that sequential process on the quality of that performance. Metaverse is a collectively used virtual world employing the ideas of virtual reality and augmented reality together with VR and AR, in which individuals would connect and function through the help of digital connections. This influence parallels extends to all business fields or Memorial accounting activities that relate to presenting information for planning, control and decision making purposes which is done by cost and managerial accountants in organizations. This aimed at employing an analytical study method in relation to descriptive-analytical study design. The data required for the analyses were gathered through completing a questionnaire that was sent to some number of academicians specialized in accounting, the faculty members, professors, and postgraduate students at Tikrit University. Respondents comprised 82 individuals with 80 usable responses collected from the distributed questionnaires. In light of the lessons learned in this study, it was found that there is a substantial positive relationship with adopting of metaverse technology quality in cost and managerial accountants' performance because it developed their skills and improves the practical IT abilities of the professionals.

Keywords: Metaverse, cost and managerial accountants, performance quality, academics

1. Introduction
In the last three years, the term of the metaverse has recently attracting much attention in research and study on it effects in the media, economic, business, accounting, and education sectors (Rabee, 2023; Jay, 2022; Al-gnbri, 2022; Şahin, 2024; Mohammed & Mohammed, 2023) [15, 13, 4, 6, 16]. Metaverse technology referred to as the factor of digitalization and technological change, which is constantly evolving and actively changing practices around the world while covering all areas of life, starting with the Far East and ending with Western countries. This is because of its capability to re-code reality with help of integration into Virtual World Technologies (Qershem, 2024) [14]. Taking into account the strong impact of the metaverse in different spheres of business and the economy including the commerce of tangible and intangible objects, it is likely to pose high influence on cost and managerial accountants especially in as far as quality performance is concerned. It is important for meeting the information needs of managers and decision makers and thus, their skills and knowledge in the usage and management of metaverse applications in organizational functioning and strategic management capacities need to be enhanced.
As the researcher's point of view, the introduction of metaverse technology will generate a set of effects on the work of cost and managerial accountants that will facilitate the improvement of their performance quality. It can be attained by enhancing the quality of data, operational activities and data handling that will provide better information to the decision makers. However, using this technology has the following benefits: easy access to data sources, agreed processing, and generation of accurate information, all of which are signs of improvement in cost and managerial accountants' performance.
However, the existing literature has widely discussed the interaction between the metaverse and accounting, based on the effects that the metaverse has on accounting information systems (Rabee, 2023) [15] or its relationship to accounting innovations (Zadorozhnyi *et al.*, 2022) [1].

Or its relationship to financial reports (Financial Reporting Council, 2021) [3]. Within the future of accounting and auditing (Al-gnbri, 2022) [4], its use in the teaching and learning of accounting (Şahin, 2024) [6], the engagement of managerial accountants in assessing sustainable development (Mohammed & Mohammed, 2023) [16]. However, the effects of this technology on the quality of performance of cost and management accountants have not been discussed, by anticipating its effects on the performance of cost and management accountants, the quality of this performance, and the developments that have occurred in it.

This study seeks to establish the expected consequences of implementing metaverse technology within the internal accounting environment with an emphasis on the performance quality of cost and managerial accountants. To achieve this goal a sample of the academicians comprising of faculty members and post graduate students in the faculty of Accounting in the University of Tikrit, are questioned. For this purpose, a questionnaire developed by the researcher was adopted for the study utilizing both the descriptive analytical research method and the normative research method the later being appropriate where future oriented research is required. This approach corresponds with contingency theory often invoked in studies on accounting where new factors impacting such practices are considered.

The significance of this study is anchored on the few studies that discuss how metaverse technology can be implemented within the accounting profession and more so concerning the performance of cost and managerial accountants. The research benefits accounting literature and development of accounting thought by examining the implications of the metaverse for the quality of cost and managerial accounts. In addition, it-points-out how certain technologies from the Fourth Industrial Revolution affect the roles of these two accountants and the possible advantages of using the metaverse to improve them.

From a pragmatic viewpoint, the research focuses on the systemic benefits of metaverse technology for firms and insists on the polytechnic urging of organizations to embrace this genius, allowing cost and managerial accountants to respond to its demands.

Following the introduction in the first section of this study, the research is structured into five sections: The second section provides a theoretical framework for the concept of the metaverse and its relevance to accounting activities in general, and to the performance quality of cost and managerial accountants in particular. It also reviews relevant accounting literature to derive the research hypotheses. The third section outlines the research methodology and approach. The fourth section discusses the research findings. The fifth section presents the conclusions and highlights the key limitations of the study.

2. Literature Review and Hypotheses Development

2.1 The Emergence and Concept of the Metaverse

The term "Metaverse" is derived from two components: Meta, meaning "beyond," and Verse, signifying "universe" or "world," collectively referring to "beyond the world" (Bilal & Al-Mahlawi, 2023) [19]. It represents a blend of the real and virtual worlds (Şahin, 2024) [6]. The concept of the Metaverse first appeared in Neal Stephenson's 1992 novel Snow Crash, where humans interact as fictional characters (avatars) in a three-dimensional virtual space that resembles the real world (Rabee, 2023) [15].

The Metaverse gained widespread attention in 2021 when Facebook rebranded itself as "Meta," and major tech companies, including Microsoft and Alibaba, expressed their interest in this technology. This announcement brought the Metaverse into public awareness. According to Mark Zuckerberg, the Metaverse is "a more interactive and embodied internet where one can do virtually anything they imagine, from meeting friends and family, working, learning, playing, shopping, creating, and even engaging in entirely new activities that go beyond today's conception of computers and phones" (Jay, 2022) [13].

Simply put, the Metaverse is a virtual world—a computer-generated environment where individuals interact with each other. It imposes no specific standards or criteria for how avatars representing humans should appear. Current Metaverse applications include platforms like Meta Horizon Worlds and Roblox. The Metaverse is a digital reality combining elements of social media, online gaming, augmented reality (AR), virtual reality (VR), blockchain, and cryptocurrencies, enabling users to interact virtually. It encompasses a range of technologies (Al-gnbri, 2022) [4].

The Metaverse has also been described as a means of creating informational content within a three-dimensional virtual environment, engaging a specific or diverse audience across virtual and real settings. It facilitates interactive messaging between content creators and audiences, allowing recipients to define the timing and environment for interactions alongside the sender. This positions the Metaverse as an expansive interactive technological platform for generating and sharing media content, events, and issues through virtual or augmented reality tools (Abdulrahman, 2022) [17].

Moreover, the Metaverse has been characterized as creating three-dimensional virtual spaces for real-life activities, where communication occurs via avatars in an unrestricted virtual environment (Şahin, 2024) [6]. The distinction between virtual reality (VR) and the Metaverse lies in focus and interactivity levels. VR immerses users in a simulated environment, while the Metaverse serves as a shared virtual space where users can interact with one another.

2.2 Benefits and Features of the Metaverse

The Metaverse relies on various complex technologies, including virtual reality (VR), augmented reality (AR), and mixed reality (MR). Its characteristics stem from the foundational technologies it incorporates, such as networks, cloud computing, artificial intelligence (AI), computer vision, software, blockchain, robotics, user interaction, and extended reality (Mohammed & Mohammed, 2023) [16]. These features can be summarized as follows (Alabina *et al.*, 2022, pp. 8–10) [7]:

a) **Blending Realities:** The Metaverse combines advanced and intertwined VR, AR, and MR technologies, collectively forming what is known as extended reality (XR).
b) **Virtual Life Practice:** The Metaverse offers diverse virtual spaces that replicate or exceed real-world spaces, including homes, workplaces, gaming zones,

and interaction areas with the outside world. These spaces provide numerous options, reducing monotony and routine.

c) **Privacy Challenges:** Privacy is a significant threat in the Metaverse, as there is little room to hide or maintain closed boundaries; users' data becomes accessible to others. However, strict privacy laws and standards can help mitigate such challenges.
d) **Realism:** In the Metaverse, the mind and body struggle to distinguish between virtual and real-world experiences, providing a sense of realism in virtual interactions.
e) **Cost Control:** The equipment and tools required, such as VR headsets, are expensive, and costs vary depending on the sector in which the technology is applied.
f) **Decentralization:** Transactions in the Metaverse do not require central authorities or third parties, unlike traditional payment systems that depend on intermediaries to complete transactions.
g) **Autonomy:** The Metaverse operates independently of centralized authorities. Its foundation lies in an immutable, shared ledger, and its data is accessible to all users, ensuring transparency and openness.
h) **Integration with Advanced Technologies:** The Metaverse incorporates AI, the internet, computer vision, sensory sensors, and other technologies like blockchain to securely store and process data, ensuring user protection and privacy.

These features highlight the transformative potential of the Metaverse in reshaping interactions, experiences, and operations across various domains.

According to Şahin (2024) [6], one of the key advantages of the Metaverse is its ability to optimize time usage. By eliminating the need for physical presence, it reduces traffic accidents, saves fuel, lowers environmental pollution, and eliminates the risk of disease transmission. Moreover, the Metaverse enhances motivation through life-like experiences, fosters opportunities for remote work and teamwork, and facilitates independent projects.

Despite these benefits, the Metaverse also has its downsides. Social and psychological issues may arise in virtual environments, and transitioning between different virtual worlds can present challenges. Additionally, a shortage of qualified personnel to address technical problems and learn new technologies can hinder its growth. Cybersecurity concerns also pose a significant risk.

The positives of the metaverse are represented by a set of points that can be stated as follows (El-Sawy, 2022, p. 140) [18]:

a) **Interactive Experiences:** The Metaverse allows for immersive, mutual interaction, such as visiting art exhibitions or attending scientific seminars, making engagement more meaningful compared to merely viewing flat screens.
b) **Real-Time Technology:** It offers synchronous, real-time experiences similar to real-life interactions.
c) **Unprecedented Compatibility:** The Metaverse ensures high compatibility for digital assets, content, and data across different platforms and experiences.
d) **Independent Economy:** The Metaverse supports a standalone and integrated economy, enabling individuals and organizations to innovate and invest in a complete virtual economic system.
e) **Permanence and Continuity:** The Metaverse is characterized by its persistence; it does not require restarting and remains active without interruption.
f) **Integration of Physical and Digital Worlds:** The Metaverse blends the physical and digital realms, encompassing experiences, public and private networks, and both open and closed platforms.
g) **Efficiency and Creativity:** Interacting in virtual environments saves time and effort, optimizes performance across various fields, and nurtures creative thinking.
h) **Virtual Revolution in Graphics:** It represents a significant leap in virtual graphics, introducing a new "third world" of immersive experiences.

Despite its numerous advantages, the Metaverse comes with a range of drawbacks and concerns that can be summarized as follows.

a) **Security and Protection:** The Metaverse poses significant security challenges. By collecting and analyzing user data, it may enable fraudulent activities targeting personal and institutional data, creating a serious threat to information security and user safety.
b) **Blurring the Line Between Physical and Virtual Worlds:** The Metaverse erodes the boundary between the physical and virtual worlds, making virtual interactions easier and often preferred over real-world engagement. This dependency on the virtual world could negatively affect human morals and behaviors, potentially leading to social detachment from real-life interactions.
c) **Isolation:** One of the most significant risks is promoting isolation. The Metaverse allows individuals to live in their own virtual bubbles, significantly reducing real-world communication with others. This isolation may hinder the development of meaningful human connections in reality.
d) **Digital Identity Theft:** Issues related to digital identity theft can arise in the Metaverse. Avatars, which represent individuals, may be hacked by others, causing chaos in the virtual environment. Such breaches could have repercussions in the real world, especially for transactions and trust.

5. Lack of Legal Regulations: The absence of comprehensive legal frameworks governing the Metaverse is one of its critical disadvantages. This lack of regulation may lead to widespread digital crimes, such as identity theft and fraud. Additionally, the unregulated nature of the Metaverse could make it difficult for users to maintain control over its usage, resulting in disorder and misuse.

2.3 Accounting Applications of Metaverse Technology

Technological advancements in the business environment significantly impact accounting operations and procedures, as well as the mechanism for providing accounting information. According to Rabee (2023) [15], the existence of economic exchange within the metaverse environment necessitates accounting to safeguard resources, provide

information to management, and guide decision-making to achieve optimal resource utilization. This means that transitioning to the metaverse requires changes in all company operations, including accounting processes. The response of accounting information systems to the metaverse environment can be summarized in three stages:

A. Accounting Data Collection Stage:
The presence of companies in the metaverse enables the automated and increasing collection of accounting data. This is due to the acceleration of data acquisition through sensors in real-time. One effective method for capturing accounting data is by utilizing sensors embedded in manufacturing systems or products that have digital twins within the metaverse.

B. Processing and Storage of Accounting Data:
To process and operate the data and accounting activities of companies in the metaverse, a cloud computing platform is required. The cloud's capabilities facilitate data processing and uploading all accounting data into a centralized cloud database.

C. Generation of Accounting Information:
The adoption of virtual reality (VR) and augmented reality (AR) technologies in the coming years is expected to lead to increased automation in the accounting field. This is attributed to the enhanced efficiency of activities such as inventory management and customer service. Thus, it is logical for the accounting field to embrace VR and AR technologies to meet evolving customer needs.

Al-Gnbri (2022) [4] suggests that the metaverse represents a vertical, rather than horizontal, development in accounting and auditing, where their objectives remain unchanged, and metaverse technologies serve as supporting tools. Furthermore, the metaverse generates new digital assets requiring accounting measurements to provide accurate disclosure tools and methods. The metaverse also potentially influences the planning of audit processes and the collection of evidence. Additionally, its highly interactive environment can be leveraged in accounting education and training.

ALSaqa *et al*. (2023) [5] indicate that applying technologies related to the virtual world significantly enhances accounting work and the components and elements of the accounting information system.

Şahin (2024) [6] notes that accounting education within the metaverse environment has already been introduced in many universities worldwide and in some universities in Turkey.

Finally, Mohammed and Mohammed (2023) [16] conclude that adopting metaverse technology improves the performance of management accountants.

While the digitization of the accounting profession refers to integrating technology and digital tools into various accounting operations and practices, it includes software applications, automation, data analytics, cloud computing, and other technological advancements to streamline accounting tasks, enhance accuracy, improve efficiency, and provide real-time financial information (Burlea-Schiopoiu *et al*., 2023) [9].

The accounting applications of metaverse technology can be exemplified by decentralized accounting, which contrasts with traditional centralized accounting systems that often rely on intermediaries. Decentralized accounting utilizes blockchain technology to record, verify, and manage financial data and transactions in a decentralized and transparent manner.

An increasing body of research explores how blockchain technology can benefit accounting practices. By maintaining transactions in an immutable ledger, a decentralized ledger system can provide a transparent and trustworthy framework for financial reporting within the metaverse. Additionally, it eliminates the need for reliance on central authorities, reducing the risks of fraud, errors, and mismanagement (Pandey & Gilmour, 2024) [8].

2.4. Tasks of Cost and Management Accountants

The performance of a management accountant varies significantly depending on whether traditional or modern methods are employed in performing managerial accounting tasks. Each accountant has their preferences for methodologies, even under similar circumstances and surrounding variables. However, outcomes, expectations, and predictions may differ depending on the management accountant's behavioral attributes, such as expertise, ability to interpret and analyze, and careful selection of data to achieve the best forecasts and predictions.

The expanding roles of management accountants are closely linked to what literature describes as business-oriented partnership roles. This increased commercial orientation has been advocated by peers, senior management, educational institutions, and professional bodies, emphasizing administrative tasks, strategic participation. The decision-making process has been presented as rational goals for this role.

Moreover, studies exploring the relationship between technology and the roles of management accountants highlight an expanded scope for management accountants as a potential result of technological integration, as outlined by Andreassen (2020):

a) Automated Tasks: Routine accounting tasks, such as data collection and calculations, are increasingly transferred to Enterprise Resource Planning (ERP) systems and integrated information systems. This shift allows management accountants to allocate more time to assisting decision-makers.

b) Decentralized Decision-Making: ERP systems and information technology are hypothesized to enable decentralized decisions, thereby increasing the need for local decision-makers to rely on accountants for information provision. Consequently, management is compelled to expand these roles, making cost and management accountants more integral than other professional identities within the company.

2.5. Performance Quality for Cost and Management Accountants

According to the AICPA & CGMA, six essential skill sets are required for cost and management accountants to ensure high-quality performance: (a. Technical Skills, b. Digital Skills, c. Interpersonal Skills, d. Business Skills, e. Leadership Skills, f. Ethics and Commitment Skills). From these core skill sets, additional sub-skills emerge, varying based on the personal experiences, knowledge, and competencies of individual cost and management

accountants (Mohamed & Mohamed, 2023) [16].

New Skills for Accountants in a Virtual World**,** In light of contemporary advancements, tools like the Metaverse and Augmented Reality (AR) can serve as educational mediums for presenting and explaining accounting information interactively during learning processes (Tuah *et al*., 2022) [12]. Augmented reality, already applied across various fields including accounting, is paving the way for a new era in the profession. The technological advancements in the Metaverse now emphasize novel perspectives on what skills will be essential for accounting practitioners in the near future.

Applications of AR and VR in the Accounting Profession, merging technologies are increasingly taking over tasks traditionally performed by accountants. These advancements are expected to continue reducing businesses' reliance on human professionals while driving demand for innovative solutions that leverage digital media technologies to address the evolving needs of the accounting industry. The accounting sector is undergoing a significant transformation with the integration of data analytics and artificial intelligence (AI). In this context, AR and VR applications in accounting achieve the following benefits:

- Enhanced visualization of financial data.
- Improved training through interactive simulations.
- Better integration of real-time data into decision-making.
- Bridging the gap between theoretical learning and practical application.

These innovations not only modernize accounting practices but also position the profession to meet the challenges of a rapidly digitizing world (Nesrine & Mohammed, 2023) [10].

Key Applications of the Metaverse in Accounting

a) Inventory Management: Managing inventory for all orders or updating it in real-time is traditionally a time-consuming process. In the Metaverse, real-time technology will allow accountants to track inventory status and value instantaneously, reducing the costs associated with physical inventory and shipping. With just a click, buyers can view new products and their specifications (including costs). This enhances consumer experiences while helping companies save on inventory costs.

b) Invoicing: The Metaverse introduces new ways to process invoices that differ from traditional methods. Accountants will need to adapt to initial invoice processing in this virtual environment.

c) Customer Management: Virtual reality (VR) will streamline and update transactional components of accounting. For businesses aiming to retain customers, seamless payment experiences are essential. Customers are more likely to return to companies offering a variety of payment methods, such as credit and debit cards or other digital options. VR technology will directly integrate transactions into the accounting system as payments are made, ensuring accuracy and efficiency.

d) Conducting Audits: VR will allow accountants and auditors to perform their tasks remotely, increasing operational efficiency and flexibility. Additionally, the Metaverse will help businesses establish robust compliance frameworks, fostering a strong foundation for adherence to regulatory requirements.

e) Preparing Financial Statements: Preparing financial statements can be time-consuming and prone to errors. Augmented reality (AR) accounting can enhance productivity and secure the entire process, reducing the chances of mistakes while streamlining workflows.

f) Opportunities in the Metaverse: The Metaverse will eventually create sustained opportunities for decentralized, collaborative, and interoperable business models, enabling organizations to expand their digital operations. While these opportunities are still evolving, they have already begun to emerge for both organizations and individuals.

2.6. The Relationship Between the Metaverse and the Performance Quality of Cost and Management Accountants

According to Rabea (2023) [15] and Imene & Imhanzenobe (2020) [2], accountants must strive to adapt to emerging technologies, including the Metaverse. Future operations are likely to rely on cloud-based systems and intelligent machines, emphasizing investments in big data and the potential of virtual and augmented reality to meet user demands for information. Accountants and accounting firms are therefore advised to embrace new IT tools and skills, aligning with technological advancements.

Mohamed & Mohamed (2023) found a positive relationship between the efficiency of management accountants and Metaverse technology. This relationship is evidenced by the crucial role of management accountants in classifying information tailored to the decisions being made. In turn, the Metaverse provides a forward-looking view of an organization’s position resulting from these decisions, thereby offering predictive insights.

The researcher emphasizes the importance of improving the performance quality of cost and management accountants to align with the requirements and characteristics of the Metaverse environment. Therefore, based on the above, the researcher expects that the metaverse environment will enhance the quality of performance of cost and management accountants. Accordingly, the research hypothesis can be formulated as follows:

H1: Metaverse technology enhances the performance quality of cost and management accountants.

3. Research Methodology and Data Collection

3.1. Research Approach

The researcher adopted a field survey approach, integrating the descriptive-analytical method alongside the normative method to conduct the study and analyze the relationships among its variables. For data analysis and obtaining results, the statistical program SPSS (Version 22) was utilized. Several statistical techniques were applied, including: (Mean, Standard Deviation, Cronbach's Alpha Coefficient, Pearson Correlation Coefficient to determine the relationships between variables, Simple Linear Regression Equation, using the Ordinary Least Squares (OLS) method, to measure the effects).

3.2. Research Sample and Data Collection

The study was conducted in the education sector,

specifically at Tikrit University. The research population comprised graduate students (Master's and Ph.D.) and faculty members, totaling 94 individuals. A comprehensive enumeration method was employed to select the sample. Both paper-based and electronic questionnaires were distributed to the participants, with 82 valid responses retrieved for analysis, yielding a response rate of 87.2%, which is considered adequate for covering the targeted population. A questionnaire was designed as the primary data collection tool and was distributed to the selected respondents.

3.3. Research Variables

The study includes two variables: Metaverse Technology as the independent variable. Performance Quality of Cost and Management Accountants as the dependent variable. Through the questionnaire prepared and formulated by the researcher, these two variables were represented in a separate section. The structure of the questionnaire consisted of two main sections: section1. Personal Information: This section reflects the demographic characteristics of the respondents, which include four pieces of information: Gender: The majority of the sample were males (67.1%), while females accounted for 32.9%. Age: Most of the sample were in the age group (20–29 years), comprising 41.5% of the respondents. Years of Experience: The largest group was in the 6–10 years of experience range (28%), followed by those with 11–15 years of experience (25.6%). Educational Attainment: The majority held a Master's degree (41.5%), suggesting that most respondents are knowledgeable and familiar with modern and contemporary technologies, which contributes to more objective responses to the questionnaire items. Section2 for Research Variables: Metaverse Technology: Measured using 10 statements. Performance Quality of Cost and Management Accountants: Measured with another 10 statements. The five-point Likert scale was used to quantify the respondents' answers, with the following options and corresponding values: (Strongly Agree (5), Agree (4), Neutral (3), Disagree (2), Strongly Disagree (1).

3.4. Research Model

A simple linear regression equation was prepared to test the research hypothesis using Ordinary Least Squares (OLS) analysis through the SPSS software. Below is the research model used to test the research hypothesis:

$$Y = \beta 0 + \beta 1 X + e$$

Where

- (Y) represents Metaverse Technology,
- (X) represents the Quality of Performance of Cost and Management Accountants,
- β1 is the regression coefficient, which reflects the change in (Y) when (X) changes by one unit,
- β0 is the intercept, which equals the value of (Y) when (X) is zero,
- (e) is the error term in the regression equation.

3.5. Testing the Research Instrument

To test the validity of the questionnaire and ensure that the items accurately measure the intended variables, the researcher calculated the validity coefficient, which is the square root of Cronbach's Alpha. Table (1) shows that the validity coefficient ranged from 0.922 to 0.933, which are high values confirming the validity of the questionnaire.

The researcher also relied on Cronbach's Alpha to test the reliability of the questionnaire. Referring to Table (1), the values of Cronbach's Alpha ranged from 0.851 to 0.871, which are also high and exceed the theoretical value of 70%. This indicates that if the questionnaire were redistributed to the same individuals under similar conditions, the results would be consistent. Therefore, these results confirm the reliability and suitability of the questionnaire for subsequent statistical analysis.

Table 1: Validity and Reliability Test of the Questionnaire

Variables	Code	Validity Coefficient	(Cronbach's Alpha)
Metaverse	X	0.922	0.851
Quality of Performance of Cost and Management Accountants	Y	0.933	0.871

Source: The table was prepared by the researcher based on the (SPSS) program.

4. Discussion of Results

4.1. Description of Research Statements

Table (2) presents the description of the survey questionnaire statements for the Metaverse variable. The description was conducted using the mean, standard deviation, relative importance, and coefficient of variation.

Table 2: Description of Metaverse Statements Based on Respondents' Perceptions

S	Statements	Mean	Standard Deviation	Relative Importance	Coefficient of Variation
X1	The ability to enjoy an interactive, reciprocal experience, such as attending scientific seminars, making interaction more effective than merely looking at a flat screen.	4.366	0.839	87.32%	19.22%
X2	Provides users with a real-time, synchronous, and direct experience similar to real-life interactions.	4.134	0.813	82.68%	19.66%
X3	Offers unprecedented compatibility for digital assets, content, and data across various platforms and experiences.	4.134	0.857	82.68%	20.74%
X4	Possesses an independent and integrated economy that enables institutions and individuals to innovate and invest in a fully virtual economic system within the Metaverse world.	3.939	0.775	78.78%	19.68%
X5	Features permanence, continuity, and stability, requiring no rebooting and operating without interruption or end.	4.098	0.840	81.95%	20.51%
X6	Delivers an experience encompassing the physical world, the digital realm, networks, and	3.939	1.010	78.78%	25.65%

	both private and public platforms, including open and closed systems.				
X7	Enhances interaction in virtual environments, saving time and effort while improving performance across various fields and fostering creative thinking.	4.061	0.822	81.22%	20.23%
X8	Marks a monumental virtual revolution in graphics, heralding the emergence of a new third-world dimension.	4.159	0.867	83.17%	20.86%
X9	Enables envisioning the future we are building and understanding how technology will revolutionize communication, as we are currently mapping out this critical transformation.	3.915	0.849	78.29%	21.69%
X10	Creates a simulation of reality with elements of awe, such as sound and visuals, rendering individuals in impressive forms that evoke a sense of realism and seriousness simultaneously.	3.854	0.772	77.07%	20.03%

Source: The table was prepared by the researcher based on the (SPSS).

It is observed from Table (2) that, based on the mean values of the independent variable statements (Metaverse), which exceeded the hypothesized value of (3), this indicates the respondents' recognition of the benefits achieved from the Metaverse environment. Statement (X1) recorded the highest level of agreement, as indicated by a mean of (4.366) and a relative importance of (87.32%). On the other hand, statement (X9) recorded the lowest level of agreement, with a mean of (3.915) and a relative importance of (78.29%). The low standard deviation and the coefficient of variation values below 50% indicate minimal dispersion in the responses of the sample participants and a consistent level of awareness regarding the importance of these statements. This supports the mean results in representing the overall sample.

The table (3) presents a description of the questionnaire statements related to the variable "Quality of Performance of Cost and Management Accountants." The descriptive analysis utilized measures such as the arithmetic mean, standard deviation, relative importance, and coefficient of variation.

Table 3: Description of the Statements on the Quality of Performance of Cost and Management Accountants According to the Respondents' Perception

S	Statements	Mean	Standard Deviation	Relative Importance	Coefficient of Variation
Y1	Information technology helps cost and management accountants complete their assigned tasks quickly and objectively.	4.085	0.740	81.71%	18.12%
Y2	The use of information technology assists cost and management accountants in providing the necessary information for making informed decisions using limited resources (effectiveness).	3.915	0.892	78.29%	22.78%
Y3	Information technology aids cost and management accountants in forecasting the future and reducing uncertainty (prediction) through the information obtained.	3.902	0.964	78.05%	24.69%
Y4	Information technology helps cost and management accountants in providing accurate and user-friendly information.	3.915	0.892	78.29%	22.78%
Y5	Information technology enables cost and management accountants to have an information base that includes all fields.	4.280	0.836	85.61%	19.52%
Y6	The use of information technology by cost and management accountants contributes to the development of their skills, enabling them to understand competitors' environments and future trends.	4.207	0.716	84.15%	17.01%
Y7	The use of modern software allows cost and management accountants to provide information objectively, accurately, and descriptively to support decision-makers.	4.024	0.816	80.49%	20.28%
Y8	The knowledge of cost and management accountants in the field of information technology enables them to handle digital applications without needing external offices.	4.134	0.828	82.68%	20.03%
Y9	Information technology assists cost and management accountants in providing information that supports the strategic planning process, which is essential for organizational operations, especially if they want to remain competitive.	4.012	0.896	80.24%	22.32%
Y10	The application of information technology pushes cost and management accountants to respond and adapt to environmental demands, requiring them to keep up with technological advancements and the information age.	3.939	0.921	78.78%	23.38%

Source: Table prepared by the researcher using SPSS software.

It can be observed from Table (3) that, based on the mean of the dependent variable statements (Quality of Cost and Management Accountants' Performance), the calculated values exceeded the hypothetical value of (3), indicating the respondents' recognition of the advantages of the environment regarding the quality of cost and management accountants' performance. Additionally, it is noted that statement number (Y5) recorded the highest level of agreement, with a mean of (4.280) and a relative importance of (85.61%), while statement number (Y3) recorded the lowest level of agreement, with a mean of (3.902) and a relative importance of (78.05%). Furthermore, the low standard deviation and the coefficient of variation value below 50% indicate no dispersion in the sample's responses, and their level of awareness of the importance of these statements, which supports the results of the mean in representing the overall sample.

4.2. Descriptive Analysis of the Research Variables

Descriptive analysis of the research variables (Metaverse,

Quality of Cost and Management Accountants' Performance) was conducted using several statistical methods, such as mean, standard deviation, minimum and maximum values, relative importance, and coefficient of variation. Table (4) presents the results of the analysis.

Table 4: Description of the Research Variables

Variables	Symbol	Mean	Standard Deviation	Minimum Value	Maximum Value	Relative Importance	Coefficient of Variation
Metaverse	**X**	4.060	0.553	2.40	5.00	81.20%	13.63%
Quality of Performance of Cost and Management Accountants	Y	4.042	0.581	1.50	4.90	80.83%	14.36%

Source: Table prepared by the researcher based on the (SPSS).

It can be observed from Table (4) that the mean for Metaverse technology exceeded its hypothesized value of (3), indicating a high level of awareness among the respondents regarding the importance of the Metaverse, with a mean of (4.060). This is further supported by the high relative importance value of (81.20%). Additionally, there is a noticeable high level of awareness among the respondents regarding the improvement in the performance quality of cost and management accountants, as evidenced by the mean of (4.042), which also exceeds the hypothesized value of (3). This is reinforced by a high relative importance value of (80.83%). Moreover, the low standard deviation and the value of the coefficient of variation below the hypothesized value of 50% for both research variables (Metaverse and Performance Quality of Cost and Management Accountants) indicate consistency in the responses of the sample and the absence of dispersion in their perception of the importance of the Metaverse and the enhancement of performance quality. This supports the reliability of the mean results in representing the overall sample.

4.3. Relationship Test

The Pearson correlation coefficient was calculated to determine the significance, strength, and direction of the relationship between the Metaverse and the Performance Quality of Cost and Management Accountants. The results of the test are shown in Table (5).

Table 5: Relationship Between the Metaverse and the Performance Quality of Cost and Management Accountants

Variables		Quality of Cost and Administrative Accountants' Performance
Metaverse	(Pearson)	0.757
	(Sig.)	0.000

(**) Statistically at the 1% significance, (*) statistically at the 5% significance

Source: Table prepared by the researcher using (SPSS).

It can be observed from Table (5) that there is a statistically significant positive (direct) correlation between the metaverse and the quality of cost accounting and administrative performance. This means that if companies adopt metaverse technology in their operations, it will be accompanied by an increase in the quality of cost accounting and administrative performance, according to the respondents at Tikrit University.

4.5 Hypothesis Testing

To test the research hypothesis, a simple linear regression equation was prepared to estimate the quality of cost accounting and administrative performance through the metaverse. This was done to determine the extent of the latter's impact on the quality of cost accounting and administrative performance. The results of the test appear in Table (6).

Table 6: The Impact of Adopting the Metaverse on the Quality of Cost Accounting and Administrative Performance

Variables	(R2)	(Adjusted R2)	(F)	(Sig.)
	0.573	0.568	107.405	0.000
	Intercept (β0)	Slope Coefficient (β)	(T)	(Sig.)
Metaverse	0.817	0.794	10.364	0.000

Source: Table prepared by the researcher using SPSS software.

It can be observed from Table (6) that the validity of the regression model is confirmed by the value of (F) which equals (107.405) at a significance level less than 5%, indicating the feasibility of estimating the quality of cost and administrative accountants' performance through metaverse technology. Additionally, the value of (T) at (10.364), with a statistical significance level less than 5%, indicates a significant effect. The positive value of the regression coefficient (β) at (0.794) suggests a positive impact, meaning that the adoption of the metaverse will positively affect the quality of cost and administrative accountants' performance by encouraging these accountants to enhance their practical and theoretical skills in line with the requirements of this technology. Furthermore, the metaverse offers advantages that make performance more distinguished and work more accurate and easier, thus contributing to the improvement and enhancement of the quality of performance for cost and administrative accountants, according to the perceptions of the respondents from the University of Tikrit. The value of the coefficient of determination (R^2) at (0.573) indicates that metaverse technology explains (57.3%) of the variations in the quality of cost and administrative accountants' performance. Based on this, it can be concluded that the research hypothesis is accepted, suggesting that metaverse technology enhances the quality of performance for cost and administrative accountants. The findings of this study align with the results of the study by (Mohammed & Mohammed, 2023) [16], which also concluded that metaverse technology stimulates skills among cost and administrative accountants, thereby enhancing their performance quality.

5. Conclusions

The purpose of this research was to demonstrate the potential response that could arise in the development of the quality of cost and administrative accountants' performance as a result of adopting metaverse technology. Through the field survey and the opinions of a sample of academics in accounting disciplines at the University of Tikrit, the results

confirmed that the metaverse environment could enhance the quality of cost and administrative accountants' performance in two ways. First, through the response that accountants could show in developing their cognitive, scientific, and practical skills to keep up with this emerging change in the business environment and corporate exchanges. Second, by benefiting from the metaverse environment to produce more accurate, relevant, and timely information with less effort and cost.

One of the main limitations to generalizing the results of this research is the small sample size, in addition to relying on the opinions of the academic group to assess the level of impact. Therefore, future studies could consider a larger sample size with a more diverse research field and approach, such as studying the metaverse adoption in companies' sectors, or by using quantitative methods to measure the variables instead of relying on a survey questionnaire. Moreover, interactive variables such as company characteristics and corporate governance could be explored, as they may modify the nature of the relationship between the metaverse and the quality of cost and administrative accountants' performance.

6. References

1. Zadorozhnyi ZM, Muravskyi V, Humenna-Derij M, Zarudna N. Innovative accounting and audit of the metaverse resources. Marketing Imenedžment Innovacij. 2022;13(4):10–19.
2. Imene F, Imhanzenobe J. Information technology and the accountant today: What has really changed? Journal of Accounting and Taxation. 2020;12(1):48–60.
3. Financial Reporting Council (FRC). Virtual and augmented reality in corporate reporting: Digital future of corporate reporting. 2021:1–28.
4. Al-gnbri MK. Accounting and auditing in the metaverse world from a virtual reality perspective: A future research. Journal of Metaverse. 2022;2(1):29–41.
5. ALSaqa ZH, Hussein AI, Mahmood SM. The impact of blockchain on accounting information systems. Journal of Information Technology Management. 2019;11(3):62–80.
6. Şahin Z. Accounting education in metaverse environment. International Journal of Economic and Administrative Studies. 2024;(41):166–181.
7. Alabina TA, Dzangieva HS, Yushkovskaya AA. The metaverse as a global economic trend. Economy, profession, business [Ekonomika, Professiya, Biznes]. 2022;(1):5–12.
8. Pandey D, Gilmour P. Accounting meets metaverse: Navigating the intersection between the real and virtual worlds. Journal of Financial Reporting and Accounting. 2024;22(2):211–226.
9. Burlea-Schiopoiu A, Popovici N, Panait NG. Metaverse acceptance by the accounting community as a premise of sustainable behavior. Systems. 2023;11(12):560.
10. Nesrine M, Mohammed A. Metaverse technique: Accounting practice in a virtual world. Journal of Research in Finance and Accounting. 2023;8(1):730–750.
11. Andreassen RI. Digital technology and changing roles: A management accountant’s dream or nightmare? Journal of Management Control. 2020;31(3):209–238.
12. Tuah B, Nopita G, Chintia R, Chintia M, Wilson YV. DPPL object recognition application for early childhood using augmented reality technology. Desain Perancangan Perangkat Lunak; c2022 .p. 1–13.
13. Jay K. Metaverse: An extension of surveillance capitalism? Foresight Journal for Future Studies; c2022 .p. 7.
14. Qershem ARA. The future of the metaverse in banking transactions. International Journal of Jurisprudence, Judiciary, and Legislation. 2024;5(2):412–467.
15. Rabea MI. Accounting information system in the metaverse world: An exploratory study. Scientific Journal of Business Research. 2023;(3), Part (2).
16. Mohamed HZ, Mohamed FMA. Competencies of management accountants in evaluating sustainable development activities using artificial intelligence technology (Metaverse). Scientific Journal of Financial and Administrative Studies and Research. 2023, 15(3).
17. Abdel Rahman IS. Employing metaverse technology inside newsrooms of Arab media institutions. Egyptian Journal of Public Opinion Research. 2022;21(2):431–468.
18. Al-Sawy MKKD. The metaverse world: Between reality and expectations, and its effectiveness in the field of graphics. Journal of Arts and Applied Sciences. 2022;9(4):135–151.
19. Bilal ABA, Al-Mahlawi W. The use of public relations in the metaverse as a tool for communication with the public: An exploratory study of the spaces of UAE governmental organizations. Arab Journal of Media and Communication Research; c2023 .p. 43.