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A Scientific Framework of Automated Accounting and Auditing on the Blockchain Technology Platform

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Abstract
The objective of this research is to contribute to the advancement of knowledge in the field of automated accounting and auditing, with a particular focus on the use of blockchain technology. Furthermore, the research will seek to establish a theoretical, conceptual and ethical framework for the aforementioned processes. This research employs a teleological approach, which is defined as a method of inquiry that seeks to identify the purpose or end result of a phenomenon. To this end, a systems approach in the modern approach of Future Technology Analysis (FTA) was used to examine the fundamental concepts underlying blockchain and its applications in accounting and auditing. The fundamental concepts underlying automated accounting and auditing on the blockchain platform were organized and explained within a scientific framework that includes theoretical, conceptual, and ethical considerations. Based on the aforementioned findings, a conceptual, theoretical, and ethical framework was developed and elucidated based on content analysis derived from an understanding of the essential elements of the topic, its underlying rationale, and its operational mechanics. This was accomplished through the use of coding in Atlas.ti v9 and ConceptDraw software. Blockchain capabilities provide a platform for automated accounting and auditing in a scientifically, practically, and logically rigorous manner. The evolution of this research was meticulously designed and presented as a conceptual, theoretical, and ethical framework. The features, alterations, and potentialities of automated accounting and auditing on the blockchain technology platform collectively reinforce the necessity for further investigation, as they demonstrate the significant advantages that this technology offers in comparison to traditional methods. This research takes a novel, forward-looking approach and envisions the use of automated accounting and auditing on the blockchain technology platform. It presents, for the first time, comprehensive scientific frameworks and a systematic model for integrating the understanding of concepts, foundations, processes, and norms.

Keywords: *Automated Accounting and Auditing, Blockchain, Theoretical Framework, Conceptual Framework, Ethical Framework.*

Introduction

The contemporary world is a field of profound change and accelerated dynamics that have brought the age of uncertainty to the fore. The ramifications of this uncertainty and the necessities that emerge from it are particularly relevant for those who create technology and digital solutions, which are rapidly expanding and encompassing an increasing number of scientific and practical domains. Abdoli et al., (2023) also state that in the world today, experts believe that

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planning and foresight are an inevitable necessity, which requires futurology.

The process of modernization requires the ability to identify emerging trends and to assess their potential implications. Consequently, a defining feature of modernity and postmodernity is the evolution of diverse theoretical frameworks within the pertinent discipline. This is due to the fact that the foundation of this era is the rejection of absolutism and esoteric theories. The application of efficacious, persuasive, and interdisciplinary perspectives, theories, and models, derived from the accumulated knowledge and insights pertaining to a subject, enables the investigation and recognition of the intricate and multifaceted aspects of a subject across diverse fields and its impact on ecosystems and the various actors within a network. Moreover, it provides the necessary mechanisms to facilitate the advancement of knowledge. Moreover, it provides a novel perspective on nascent trends and the fundamental principles of acceptance, enhancement, and evolution of the subject, which are essential for awareness and decision-making. In light of these considerations, it is evident that a robust knowledge base and scientific frameworks are necessary in these fields. Despite the plethora of theoretical advancements in financial reporting, accounting procedures persist in presenting a multitude of challenges and problems. In this context, technology, with its ongoing advancements, has emerged as a key solution to many of these challenges. Blockchain is currently one of the most significant technologies available, with the potential to address the fundamental issues currently facing accounting and auditing practices. As Fischer (2018) asserts, blockchain has the capacity to "solve the major problems of current accounting and auditing." Ahmadi et al., (2022) believe this technology increases productivity, speed, security and reduces costs in most operations, and as a result, it will significantly improve the quality of banks' services to end users.

The issues raised by this research contribute to the accumulation of knowledge in this field and address a previously existing gap in the existing body of knowledge. To achieve this objective, a future-oriented technology analysis method was employed, which involved investigating and explaining the scientific framework (theoretical, conceptual, and ethical) of financial reporting according to the capabilities of the blockchain platform in the fields of accounting and auditing. This issue is aligned with the hypothesis of automated accounting and auditing on the blockchain platform, which is of significant interest for two reasons. Primarily, the subject under review is innovative. Secondly, it has international scope and the potential for scientific and practical applications.

Literature Review

Conceptual Foundations

The fields of accounting and auditing have undergone profound changes over the centuries, including not only changes in content and methodology, but also the advent of new technologies that have revolutionized the way information is processed in these fields. If we consider accounting and auditing standards as the primary driver of methodological, behavioral, and structural developments, as well as of content and information value, it becomes clear that the empirical knowledge supporting these developments is derived from the course of technical, economic, and social developments, as well as from globalization. The ideological foundation of accounting and auditing is based on subjective and experimental notions of explaining and transforming existing circumstances, as well as the politics of development and evolution. Needs and desires give rise to ideas, and gradual cognitive and experimental evolution in adaptation and response to environmental conditions and factors leads to the emergence of subsequent generations of accounting and auditing. In this phase of technological development, advancements and innovations driven by knowledge and experience play a pivotal role, as they have throughout the history of technology. This process requires a

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comprehensive examination of historical data, an acute observation of the present circumstances, and a discernment of future projections. This has resulted in the advent of the mental, manual, mechanized, and soon-to-be-automatic generations in accounting and auditing. The advent of automated accounting and auditing represents a significant and ideal evolution and development in information systems, crediting, and reporting. This important development necessitates collaboration and solidarity with scientific and technical constructions, convergence, and synergy of information systems and new technologies, companionship and cooperation of the administrative system, alignment and agreement with laws and regulations, like-mindedness and conformity with accounting and auditing standards and principles, and alignment and similarity with the needs and wishes of the beneficiaries.

In essence, automated accounting and auditing is a process whereby a series of routine, stable, repeatable, and structured actions are performed, thanks to machine learning capabilities and new technologies. The application of machine learning allows accounting professionals to execute accounting and auditing procedures via software. The advent of new technologies has facilitated the automation of these processes to a significant extent, thereby reducing the dependence on manual inputs and human intervention. In consideration of the aforementioned factors, the definition of automatic accounting and auditing may be stated as follows: the performance of traditional accounting and auditing operations and techniques using technology in an online environment and without human intervention. In other words, the implementation of automated accounting and auditing procedures, coupled with the real-time identification, measurement, collection, recording, classification, summarization, analysis, reporting, and crediting of economic events and activities, enables the use of technology and adherence to established standards, principles, and regulations. This approach aligns with the objective of facilitating informed decision-making among stakeholders and in the public interest.

The implementation of automated accounting and auditing processes has the potential to free the profession from the burden of tedious, time-consuming, voluminous, and error-prone tasks, including recording complex business transactions, tracking transactions and documentation, and preparing stressful and voluminous reports. Moreover, it augments the velocity, precision, and dependability of the reconciliation procedure by automating routine operations and high-volume transactions. The availability of standard frameworks and templates, coupled with customizable and compliant validation, provides an optimal strategy for low-risk automation.

The automating repetitive and simple tasks, accountants and auditors can be prepared and freer to face more complex issues. For example, data collection can be automated and then accountants will simply focus on data interpretation and implementation (Erickson, 2017). When accountants are not required to do manual entries, they can instead focus on analyzing statements and financial matters where accounting expertise is essential. Such analyses also enhance the quality of financial statements, thereby increasing reliability (Lupasc et al., 2012). If all components function as intended and concepts are designed in accordance with international accounting standards, accounting errors will also be reduced because humans will no longer intervene in the process, thereby rendering financial statements more reliable than they are currently (Uwadiae, 2015). Activities such as bank reconciliation, accounts payable and expense management will also be automated in agreement with Web Accounting. More accounting tasks that can easily be done by computer are: sending audit fee, settlement of invoice payments, risk assessment, calculation analysis, classification of invoices (Erickson, 2017), audit planning, analytical review methods,

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materiality assessment, internal control assessment, risk assessment and related decisions and... (Gulin; Hladika; Valenta, 2019). Moudud (2014) in his review emphasizes that digitization and automation are useful for auditors in performing audit planning processes, analytical review methods, materiality assessments, internal control assessment, risk assessment and related decisions. There is research that analyzes how many companies are using digital solutions today and what they expect to be using in the next few years. These researches are mainly initiated and implemented by the largest audit institutions (Moudud-Ul-Huq, 2014), some of which we discussed in the previous sections.

As digitization and automation are used to eliminate or minimize routine and repetitive tasks, it enables accountants to focus on more creative, unusual, and unstructured tasks that require more thought and additional skills. By automated accounting and auditing processes and spending less time, accountants are more connected to their clients and increase their advisory services in daily business operations. This change of approach will affect the future activities of experienced accountants (Gulin; Hladika; Valenta, 2019). Gunthrie and Parker (2016) emphasize that accountants and auditors will experience extensive challenges with the automated processes that complete tasks faster than themselves. According to Forbes (2018), automated provides the opportunity for accountants to become value-added business consultants and analysts. Accountants can then focus on performing more value-added, analytical, and strategic tasks, which in turn may increase their job satisfaction. The automated is expected to enable accountants to improve digital competencies through their knowledge. However, accountants must develop their skills to adapt to the changes that automated brings. Arntz et al. (2017) state that currently some accounting tasks (invoicing, payroll calculation) are automated in many companies (especially in large companies) (Arntz et al, 2017). Therefore, since the beginning, the accounting and auditing profession has been important for development and growth. Automated accounting and auditing processes and changing the requirements of the profession will cause the profession, which today seems to be the only display of compliance with standards and legal requirements, to shut down. Then the opportunity arises for this profession and professionals to excel in other fields of knowledge, such as consulting and business strategy, and to acquire extensive knowledge in education (Sumar, 2021). In their 2013 study, Taipaleenmäki and Ikäheimo proposed a hypothesis suggesting that the advent of automated accounting processes may precipitate a decline in the demand for accounting expertise. They further advanced the argument that it is imperative for employees to cultivate technological proficiency in order to gain an understanding of these automated processes.

It is imperative to recognize the mounting body of research that has identified the potential for automated accounting and auditing when cloud processing, the Internet of Things, big data, artificial intelligence, and blockchain are integrated as the most effective technologies in the accounting and auditing process, or vice versa. The implementation of concepts in different dimensions enables computers to read, recall, analyze, and transfer relevant and timely data for accounting and auditing processes. Upon receipt, the aforementioned data is recorded, purified, classified, transferred, processed, reported, and sent to stakeholders based on standard algorithms and rules and regulations. The results and findings of events and activities are then discussed in a multitude of documentation topics, including deep calculations, financial reporting, risk analysis, proof of management claims, internal control, validation, assurance, and numerous other functions that are performed intelligently and automatically.

Theoretical Foundations

In order to achieve the knowledge and epistemological goals resulting from accounting and auditing in blockchain

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technology, this section will describe the related theories, perspectives, models, and approaches. This will provide a comprehensive theoretical framework for this issue, which will be of benefit to those engaged in the field.

Evolution Theory: The genesis of development and evolution can be considered in light of the theory of evolution. Blockchain represents an evolution in technology and a product of digital Darwinism, exhibiting intrinsic perfection. This evolution fosters a more profound and vital interconnection within the tangible realm of industries and companies, culminating in a state of industrial social perfectionism.

Agency Theory: Agency theory seems to be the standard approach to emphasize "the conditions of uncertainty that lead to potential information asymmetries between the executives who manage the firm and external investors" (Walker, 2013). Blockchain can be seen as a non-pecuniary open innovation ecosystem that will help to circumvent opportunistic behaviors that are frequently exercised by a smaller group of individuals in a society, a classic. The same technology can be used in private or semi-private settings where the main aim is to diminish market uncertainties and the asymmetry of information between agents. This results in a reduction of transaction costs and a reformulation of the role of the middleman agent (Torres de Oliveira, 2017). Therefore, blockchain technology facilitates a substantial increase in the efficiency of agency relationships in orders of magnitude and lowers agency costs equally substantially in orders of magnitude. Blockchain technology provides formal guarantees to taking part in principals and agents that address agency problems in corporate governance comprehensively (Kaal, 2019).

Stakeholder Theory: Stakeholder theory recognizes that firms are part of a greater social system and decisions cannot be made in isolation. The theory promotes an open and inclusive relationship with all stakeholders consisting of managers, directors, investors, employees, other companies, service providers, government, and society at large (Freeman, 1994). From the stakeholder theory perspective, blockchain technology can be an effective mechanism to promote an open and inclusive environment. Organizations can promote stakeholder inclusion and expand business opportunities within blockchain networks (Han et al., 2023). The distributed nature of blockchain technology can provide a valuable tool for promoting collaboration and interaction between different people across vast networks. Using AI technology, companies can promote an open and inclusive corporate culture to empower decision-making using blockchain data verified and shared by multiple parties (Vasarhelyi, 2012).

Institutional Theory and Deinstitutionalization Theory: Institutional theory is a prominent perspective in contemporary organizational research (David; Tolbert and Boghossian, 2019) and a powerful lens for examining economic phenomena both at a moment in time and over time (North, 1990). It encompasses a large, diverse body of theoretical and empirical work connected by a common emphasis on cultural understandings and shared expectations. (David; Tolbert and Boghossian, 2019). Institutional theory explains why and how organizational structures and processes become established. This theory deals with the consequences of this institutionalization (Rahnemay Roodposhti and Salehi, 2009). In the meantime, the government, as the largest institution and the main driver, plays a fundamental role in the formation of institutionalization and legalization functions (Kousari & Yari, 2024).

From the perspective of blockchain technology, institutional theory could examine how logistics and supply chain managers attempt to manage space, resources, and legitimacy to overcome institutional pressures. In particular, it could examine how innovative approaches, such as blockchain, by competitors lead to mimetic processes (Kummer et al., 2020). A theoretical analysis suggests that the adoption

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of blockchain technology is influenced by two main factors. Given that we are currently observing companies at the forefront of understanding and developing blockchain systems, it is likely that large-scale adoption of the technology will occur from a user perspective. The first factor relates to the legitimacy that underpins the technology, as postulated by Dowling and Pfeffer (1975). In this regard, Naeemi, Yazdifar & Shafiei (2021) believe that it is necessary to first create the necessary grounds for the adoption of this innovation in the organization.

Path Dependency Theory: Path dependency theory (PDT) contains the philosophy that past events influence future events (Bergek & Onufrey, 2013). This theory considers the history of practices (Schreyögg and Sydow, 2011) and builds on this insight to show how past events and practices (can) influence future actions and decision-making (Rowlinson et al., 2014). In the context of blockchain implementation, path dependency theory posits that organizations may adhere to a particular "path" or blockchain standard due to the influence of institutional norms and arrangements. In addition, the phenomenon of "lock-in," which describes the tendency for a standard to become entrenched in the marketplace, can make it difficult to change the standard once it has gained traction, even when alternative options may offer superior efficiency. In the context of blockchain standards, where "a dominant design has not yet stabilized" (Geels, 2004, p. 37), the decision to adopt a particular standard carries inherent risks and uncertainties. There is a possibility that the chosen path may not be consistent with the future dominant design, which could lead to higher transaction costs (Herold et al., 2022). Considering the above factors, it can be suggested that the optimal timing for blockchain implementation may depend on the lock-in effect (Bahli and Rivard, 2003). The goal is to capitalize on a potential cost advantage with respect to transactions. However, path dependency theory posits that the implementation of a particular blockchain standard, whether dominant or alternative, can be self-reinforcing, resulting in a positive feedback loop. This is due to the fact that as the number of individuals adopting the blockchain standard increases, so does the likelihood of further adoption. While this can be beneficial if a dominant design has been chosen, the lock-in effect can also lead to negative externalities and inertia. To illustrate, the adoption of a particular technology may lead to a reduction in the value of competing technologies, thereby limiting their potential for adoption (David, 1985). The cumulative effect of positive feedbacks and negative externalities leads to a particular trajectory where the self-reinforcing nature of the chosen option precludes the possibility of alternative future scenarios, thereby creating a state of inertia driven by the lock-in effect (Herold et al., 2022).

Theory of Professions: The Theory of Professions provides an analytical lens with which to understand the characteristics, attributes, and structure of the accounting profession. The framework includes characteristics that previous research has identified that explain how membership in a profession is achieved by stakeholders (Pollock & Amernic, 1981). In an accounting context, the Theory of Professions is described as the power and reputation granted by society to the profession to protect the public interest, where professionals gain a body of knowledge that is connected to the major needs and values of the social and accounting systems (Pollock & Amernic, 1981). By using this theory to investigate the professional role, it is possible to also examine the accountant's practice. The professional role refers to the expected function an accountant has at a particular company based on the education and knowledge necessary to perform their specific tasks (Greenman, 2017). The purpose of using this theoretical framework is twofold. First, to challenge the conventional definition of the profession. Second, to examine which aspects of the accounting profession are susceptible to automation. In light of these considerations, an analysis can

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be conducted to determine which aspects of the accounting firm's employees are or are not replaceable and whether the profession is at risk, as has been discussed in the media. In addition, as noted above, a certain level of education is required for an occupation to be considered a profession. It is important to consider the educational aspects and salary levels of employees when introducing technology into organizations, as these factors can influence the impact of technological advances on the workforce. The phenomenon that technology affects employees with a certain level of education and salary is referred to as job polarization (Törnqvist and Forss, 2018).

Job Polarization Theory: This is a recent, much debated phenomenon, referred to as job polarization, i.e. the simultaneous growth of high-skill, high-wage jobs and low-skill, low-wage jobs at the expense of middle-skill jobs. Prominent explanations for this phenomenon are routine-based technological change and the offshorability and automation of jobs (Heyman, 2016). Job polarization implies that we should expect an increasing employment share for occupations in the higher and lower parts of the wage distribution and that the employment share should decrease in the middle of the wage distribution (Heyman, 2016).

The digitization and automation of occupations has led to a phenomenon known as job polarization. Job polarization is a phenomenon that occurs when the automation of routine tasks increases, leading to increased demand for cognitive occupations and increased employment in low-education occupations due to the displacement of individuals from the middle category of the labor market. As a result, middle-skill occupations are most affected by automation, a phenomenon that is particularly evident in the case of accountants (Goos & Manning, 2007). When the number of tasks, which are completed by the automatic technologies, increases, the process of job polarization appears. It carries out the increased need for cognitive careers and the increase in recruiting for the jobs, where the low level of education is required. It happens because the middle type of professions is being forced out of the market. The middle type of professions with average pay, where the middle education level is required, is affected the most by the automation of technologies, and this is where the profession of accountants is based (Goos & Manning, 2007).

Information Theory and Information Processing Theory: Information theory is a scientific discipline concerned with the transmission, processing, extraction, and use of information. In this context, information can be defined as the resolution of uncertainty (Tushman and Nadler, 1978). Information theory can be used to link any uncertainty and complexity within the supply chain. The provision of additional information can serve to reduce uncertainty and risk (Jia; Peng; Green; Koh and Chen, 2020). In this regard, information theory provides a foundation for exploring the potential of blockchain to enhance information processing capabilities and increase transparency along the supply chain (Kummer et al., 2020).

Information theory in logistics and supply chain management, as well as in blockchain applications, often addresses the acceptance of information technology and information processing (theory) within information systems. In line with information theory (Galbraith, 1974), information processing theory views organizations as systems that need to process information to reduce uncertainty (Saberi et al., 2019). Therefore, information processing theory can help identify the organization's existing or required information processing capabilities for blockchain data analysis (Bell DeTienne & Jackson, 2001). With the application of blockchain, organizations can adopt information processing theory to evaluate the competitiveness of different blockchain networks (Saberi et al., 2019), to identify information processing requirements from blockchain adoption (Martinez et al., 2019), and to analyze how blockchain transparency can improve existing information processing capabilities (Kummer et al., 2020).

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Network Theory and Actor-Network Theory: Network theory is a mathematical framework for modeling interacting systems as networks (or graphs) formed by a set of relations (edges) between discrete entities (nodes) (Ortega et al, 2018). In this context, the field of network theory, more specifically social network theory, examines inter-organizational linkages and relationships and their impact on network management (Mitchell, 1969). In other words, network theory studies the interplay and management of inter-organizational relationships. Similar to transaction cost analysis, network theory examines the links between organizations, but with a focus on relationships rather than transactions (Rinehart et al., 2004).

From the perspective of blockchain technology, the application of network theory can facilitate the examination of the dynamics within inter-organizational networks. An assessment of the function of relationships and information transparency can help managers determine whether personal relationships can be replaced by the enhanced information sharing facilitated by blockchain technology. In addition, network theory can be used to assess the impact of "trustless systems" on business relationships. Such systems can not only automate contract compliance, but also potentially replace personal relationships (Tian, 2016). In their respective studies, Li and Zhou (2020) and Sternberg et al. (2021) propose that blockchain applications in the supply chain context are subject to network effects, where the benefits of the technology are derived from an increasing number of parties adopting the technology. Conversely, McCallig, Robb, and Rohde (2019) present a design for a blockchain-based accounting information system using network analysis.

Transaction Cost Analysis Theory / Transaction Costs Theory: The theory of transaction cost analysis or transaction cost economics is based on the premise that a firm's decision-making process is influenced not only by price but also by the transaction costs associated with the decision (Williamson, 1973). The basic premise of transaction cost theory is to increase economic efficiency in the exchange of products or services through the marketplace. In addition to production costs, transaction costs are critical in identifying an efficient economic unit and its decision boundary. In addition to the aforementioned categories of transaction costs, Williamson (1975) proposed three determinants of transaction costs - frequency, asset specificity, and uncertainty - as key dimensions that capture the characteristics of economic exchange between institutions. The application of transaction cost analysis can help determine the impact of changes in transaction costs resulting from the advent of blockchain technology. This, in turn, influences the configuration of organizational structures and practices. Consequently, transaction cost economics can shed light on how specific elements of blockchain technology alter the design of contractual arrangements and how automated smart contracts can significantly reduce transaction costs (Kummer et al., 2020). Indeed, blockchain technology can provide value across multiple dimensions by decreasing information asymmetries and reducing related transactional costs (Block et al., 2018).

Innovation Diffusion Theory and Perceived Characteristics of Innovating Theory: Innovation diffusion theory postulates that the decision to adopt or reject an innovation depends on an individual's beliefs about the innovation in question (Karahanna, Straub & Chervany, 1999). The goal of innovation diffusion theory is to elucidate the processes involved in innovation decision making, to identify the determinants of adoption rates, and to categorize different types of adopters. The theory makes it possible to predict the likelihood and rate of adoption of an innovation, thus providing insight into the potential success of a given innovation (Chen, Gillenson & Sherrell, 2002). Diffusion of innovation theory posits that communication plays an important role in social change within a community (Rogers, 1962). Accordingly, the diffusion of

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innovation theory model proposed by Rogers is the models used to analyze the communication process of any innovation by the members of a system.

Diffusion of Innovation Theory (DOI) is a foundational theory in the field of consumer behavior that provides insight into the processes by which consumers adopt and use new products and services (Rogers, 1962). The Perceived Characteristics of Innovation Diffusion Theory (PCIT) incorporates three additional attributes, namely image, voluntariness, and behavior that are not present in Innovation Diffusion Theory (IDT). Perceptions of voluntariness influence behavior, which in turn influences actual behavior relative to voluntariness. The results show a strong correlation between adoption rate and demonstrability, suggesting that as demonstrability increases, adoption rate increases. The PCI model posits that observability consists of two sub-characteristics: visibility and demonstrability of results. In addition, the model suggests that the willingness of users to accept or reject an innovation is also influenced by voluntariness (Prashant Dongre, 2022).

Contingency Theory: Liang and Lu (2013) believe contingency theory originates in organizational theory and emphasizes developing the most appropriate management approach to respond appropriately to different situations. Therefore, contingency theory is considered a dominant, theoretical, rational, open system model at the structural level of analysis in organization theory (Scott, 1992). According to this theory: (I), there is no best organizational structure or managerial method that fit all firms, and (II) the effectiveness of any managerial methods or organizational structures depends on internal and external business environments and processes (Galbraith, 1974). The basic assertion of contingency theory is that the environment in which an organization operates determines the best way for it to organize (Scott, 1992).

Contingency theory can help investigate how organizations react to their external environment. So, contingency theory has elements of both science and technology and it makes the organization have a more efficient transformation process (Rabey, 1989: 168). According to this theory, the fit between benefits deriving from technology and the organization's business environment is one of the critical factors managers should consider in adopting technology (Araral, 2020).

Game Theory: Game theory provides a set of mathematical tools for analyzing interactions among decision makers who are assumed to be rational (Liu et al., 2019). In the context of game theory, players can adopt different strategies, influence other players, and receive certain payoffs as a result of their actions (Zhang and Wu, 2021). In a game, each decision maker, as a player, chooses a strategy with the goal of maximizing his utility given the strategies of the other players. The underlying assumption is that each player is rational and will choose a strategy that maximizes his utility because it is the most likely outcome given the available information. This is called a Nash equilibrium. In essence, game theory is a mathematical model that examines the strategic interactions between players with the goal of facilitating sound decision making. Applying game theory to the blockchain platform allows for the study of the strategies employed by consensus nodes. By capturing and anticipating mutually exploitative behaviors, consensus nodes can develop an optimal response strategy focused on maintaining equilibrium. Through game-theoretic analysis, consensus nodes can identify and predict each other's mining behavior, and then develop optimal response strategies based on equilibrium analysis. Incentive mechanisms can be developed through game theory to deter consensus nodes from misbehaving or initiating attacks. Game theory can be used to inform voluntary decision making with the unanimous consent of nodes in the blockchain network. Furthermore, the configuration of the mining apparatus is based on the principles of cryptography and game theory.

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Theory of Reasoned Action or Reasoned Action Theory: Fraj and Martinez (2003) put forth the proposition that the theory of reasoned action is predicated on two fundamental assumptions. Primarily, it is based on the assumption that individuals possess the capacity for rationality and engage in a systematic utilization of information. Secondly, it is assumed that individuals consider the potential consequences of their actions before deciding whether to adhere to a specific course of conduct.

This theory recognizes the existence of factors that can interfere with the ability of attitudes to influence behavior (Amalathas et al., 2022). The model postulates that any human behavior can be predicted and explained by three primary cognitive components: attitudes (a person's favorable or unfavorable feelings toward an activity), social norms (social influence), and intentions (a person's decision to perform or refrain from performing a behavior) (Prashant Dongre, 2022). According to the theory of reasoned action, an individual's attitude toward a particular behavior is a function of his or her behavioral intention, which in turn is a function of his or her attitude toward the behavior in question and his or her subjective norms (Fishbein, 1979). In the context of blockchain technology, an organization's attitude is shaped by its assessment of blockchain's potential to provide solutions. Subjective norms include the influence of productivity achieved by other industries and competitors, although these are weighted by the assessment of decision makers within the organization. Behavioral intentions can be understood as the actions of top management, such as discussing blockchain in strategic meetings and forming teams for research and development. This theory provides a basis for the various theories mentioned (Dua, 2023). This theory also considers the implementation of accounting and auditing on the blockchain platform. It examines the components of intention, attitude, and norms resulting from effectiveness, efficiency, economy, and their interactions with the accounting profession and society.

Theory of Planned Behavior and Decomposed Theory of Planned Behavior: This theory is an extension of the Theory of Reasoned Action (TRA) (Dua, 2023). While both the Theory of Planned Behavior (TPB) and the TRA assume that an individual's behavioral intention (BI) influences his or her behavior, the TPB employs perceived behavioral control (PBC) for actions that are not under the individual's volitional control (Prashant Dongre, 2022). In light of this, the Theory of Planned Behavior incorporates perceived behavioral control (PBC) as a novel variable within the Theory of Reasoned Action. PBC is primarily influenced by the accessibility of resources, opportunities, and competencies, as well as the perceived importance of these resources, opportunities, and competencies in achieving outcomes (Prashant Dongre, 2022). The Decomposed Theory of Planned Behavior (DTPB), proposed by Taylor & Todd (1995), consists of a decomposition of the Theory of Planned Behavior (Ajzen, 1991). The objective of this theory is to facilitate a more nuanced understanding of the relationships between belief structures and antecedents of intention (Taylor & Todd, 1995).

In the context of blockchain technology, the term (PBC) is used to describe a firm's capacity to achieve its desired objective through actions or decisions made in relation to blockchain technology. This capacity is contingent upon the firm's ability to align with technological advancements (Dua, 2023). Furthermore, the potential of the PBC to streamline automated accounting and auditing processes, the feasibility of its integration, the capacity to exert control over blockchain technology in this domain, and the relative ease or difficulty of doing so will be evaluated.

Theory of Interpersonal Behavior: The Theory of Planned Behavior (TPB) has been the subject of considerable criticism for its perceived inadequacy in explaining the emotional dimension of consumer behavior. The TPB explains behavior through intention

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and is considered a static model based on self-interest motives that excludes emotional and unconscious influences (Lopes et al., 2019). But the important thing is that habits also moderate behavior and both of these effects are moderated by facilitating conditions (Berenji, Rahmaty & Kiakojouri, 2024). In contrast, the Theory of Interpersonal Behavior (TIB) provides a rationale for emotional responses along with an explanation of cognitive and social influences to predict consumer behavior (Donovan, 2011). This theory primarily elucidates the intricacies of human behavior, elucidating how social and emotional factors exert influence. Consequently, to enhance predictive efficacy, this theory incorporates not only the full range of elements encompassed by TRA and TPB, but also habits, facilitating circumstances, and affect. Roles, norms, and self-concept are integral to the social factors construct, which is closely aligned with the subjective norms notion in TRA. In essence, an individual within the TPB framework is neither exclusively deliberate nor entirely automatic, nor wholly autonomous nor entirely social.

Integrated Behavioral Model: The Integrated Behavioral Model (IBM) represents a logical progression of the three social science theories of Reasoned Action, Planned Behavior, and Interpersonal Behavior.

According to the Integrated Behavioral Model (IBM), determinants of individuals' behavioral intentions are their experiential and instrumental attitudes toward the behavior, their descriptive and injunctive norms, and their perceptions of the difficulty or ease of performing the desired behavior and perceived self-efficacy (Glanz & Viswanath, 2008). These factors are grouped into four categories: Experiential Attitude, Descriptive Norm, Personal Agency, and Self-efficacy (Glanz et al., 2008). The next construct in the Integrated Behavioral Model is the perceived norm, which encompasses the social pressure an individual may experience regarding the performance or nonperformance of a particular behavior (Fishbein, 2007).

Affect, Behavior and Cognition Model: The ABC model includes the three elements; affection, behaviour and cognition (Breckler, 1984) that ABC is made up of three components, affective, belief, and cognitive (Van Harreveld et al., 2015). In this context, an understanding of blockchain technology can engender a different attitude towards it. Furthermore, an awareness of the influence of automated accounting and auditing on the blockchain technology platform will inform perceptions of the technology. Using the structural components of the ABC model, this question can be answered as follows: The technological competence of the accountant and auditor can be considered as an effect component. The ease or difficulty with which technology is understood and utilized can influence perceptions of automated accounting. The perception of the technology may be either straightforward or challenging, contingent on the level of familiarity with it. The behavioral component can be attributed to the accountant's or auditors previous experience with accounting and auditing in the context of digitization, automation, and automation of certain procedures. Furthermore, the individual's attitude toward the automation of accounting and auditing in the blockchain technology ecosystem exerts an influence. The cognitive component can be exemplified by accounting and auditing beliefs and knowledge about automated accounting and auditing processes and blockchain technology. These beliefs and knowledge are shaped by previous experiences and by information from various sources, including industry rumors, social environment, society, and media. These factors can influence the accountant's attitude and auditor's influence.

Motivational Model and Igbaria's Model: The Motivation Model (MM) posits that extrinsic and intrinsic motivation are the primary determinants of an individual's intention to engage in a behavior. Furthermore, intention to perform a behavior

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is a construct that is closely related to actual behavior (Venkatesh & Speier, 1999).

The motivation model postulates that user behavior is shaped by both extrinsic and intrinsic motives. Extrinsic motivation, as defined by Davis, Bagozzi, and Warshaw (1992), can be understood as the belief that people act to achieve external goals that are not directly related to the activity itself. These external goals may include improved job performance, compensation, or promotion. Examples of extrinsic motivation include perceived utility, perceived ease of use, and subjective norm. In contrast, intrinsic motivation is defined as behavior that results in a sense of pleasure and satisfaction for the individual (Vallerand et al., 1997). In the context of blockchain technology, external factors such as peer pressure, regulatory requirements, industry needs, and customer demands will drive its adoption. Conversely, the intrinsic motivation for any organization would be innovation, competitive advantage, and value creation (Dua, 2023). Given these benefits, the implementation of blockchain technology in the automation of accounting and auditing processes is a compelling proposition. The benefits of this approach, which include transparency, reliability, integrity, relevance, and utility, provide a solid rationale for its implementation.

Social Cognitive Theory: Social Cognitive Theory (SCT) was developed using three key factors: behavior, personality, and environment. These factors interact bidirectionally to predict group and individual behavior. SCT is an inseparable triadic structure in which all three components always influence and determine each other. The SCT model is used to assess the use of information technology by incorporating several factors such as self-efficacy, performance expectations, anxiety, affect, and personal outcome expectations (Prashant Dongre, 2022). This theory, which deals with the concepts of human agency and human capability, posits that humans are self-developing entities who acquire knowledge through a combination of symbolic and direct factors. The personal factors that influence this process include, but are not limited to: self-evaluation goals, self-efficacy, social comparison, and values. The environmental factors that influence this process include, but are not limited to, the social model, feedback, norms, and rewards. Finally, the behavioral factors that contribute to this process include, but are not limited to, the choice of action, the effort to learn, the continuity of use, and the achievement of goals through the use of these factors (Dua, 2023). In the literature on socio-technical issues, the interrelationship between people and technology is a recurring theme (Sawyer & Jarrahi, 2014), as is the relationship between socio-technical system components (Borrás & Edler, 2020).

In the context of blockchain technology, personal factors can be broadly classified into three categories: technical, environmental, and behavioral. Technical factors relate to the technical assessment of the company in terms of efficiency and comparison with industry standards. Environmental factors include feedback from value chain partners or customers regarding the adoption of blockchain technology. Finally, behavioral factors include the decision to adopt blockchain technology, the consistency of efforts, and the achievement of desired objectives through its use (Dua, 2023). In the context of accounting and auditing, the emotional responses associated with anticipated enhancements in personal and professional status and performance are of interest. These include the experience of pleasure and satisfaction, as opposed to anxiety and dissatisfaction, as well as the sentiments of success or failure in task completion.

Technology Acceptance Model: The Technology Acceptance Model (TAM) represents an adaptation of the Theory of Planned Behavior (TPB), as originally proposed by Fishbein and Ajzen (1975). The TAM model is attractive because of the theoretical and psychometric ambiguity of the TRA model, applied subject norms are removed (Prashant dongre, 2022). The TAM intends to explain the behavior of the users of a computer system, claiming that the use of

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the computer system depends directly on the intention that the individual has in using it (Almeida, 2002). The TAM model theories that individuals' attitudes towards new technology are determined by two primary factors (Davis, 1989). The model's strength comes in its simplicity (Prashant dongre, 2022).

In 2000, the model was extended by Davis and Venkatesh that added several impacts to the factor perceived usefulness. The aim was to increase the understanding of user acceptance and usage of new systems. The first three impacts that were added were; subjective norm, voluntariness and image. These are reflected as social forces affecting individuals' attitude to either adopt or reject a new technological system (Davis & Venkatesh, 2000). Three additional factors were incorporated into the model: job relevance, output quality, and result demonstrability. These cognitive determinants are subcategories of perceived usefulness and were included because they are perceived as impacting whether individuals accept technology (Davis & Venkatesh, 2000). In light of these considerations, Venkatesh and Davis developed and refined the Technology Acceptance Model (TAM) to include additional critical determinants of perceived usefulness and intention to use. These included social influence processes (subjective norm, voluntariness, and image) and cognitive instrumental processes (job relevance, output quality, outcome demonstrability, and perceived ease of use). This led to the development of TAM2.

In order to improve the adaptability, explanatory power, and specificity of the Technology Acceptance Model (TAM), the Extended Technology Acceptance Model (ETAM) incorporates a number of novel elements. The concept of ETAM has been proposed in two different research studies. TAM2 was the first study to examine the emergence of perceived usefulness and behavioral intention (BI). TAM2 shows superior performance in both voluntary and mandatory contexts. The only exception is subjective norms, which are influential in mandatory contexts but not in voluntary contexts. The second study provided insight into the factors that influence perceived usability. The two primary categories of antecedents that influence perceived usability are adaptations and anchors. The anchors group includes general beliefs about using computer systems, including enjoyment and objective usability. In contrast, the adaptations group includes beliefs formed based on direct experience with a system, such as external control, computer self-efficacy, computer anxiety, and computer playfulness (Prashant Dongre, 2022).

The most current version is TAM 3, which presents a complete nomological network (integrated model) of the determinants of IT adoption and use by individuals (Venkatesh & Bala, 2008). Venkatesh et al. (2003) integrate multiple models, such as task technology matching model, rational behavior theory, and planned behavior theory, and propose the integration theory of technology acceptance and utilization (UTAUT). This led to TAM3, which contains all variables of the above model (Venkatesh & Bala, 2003). The TAM and its extended version are two of the most widely used frameworks for understanding user acceptance of information technology.

The perceived usefulness of blockchain technology is largely dependent on its interoperability and the potential it offers companies to gain a strategic advantage. Although blockchain has demonstrated its usefulness in financial transactions, it has yet to prove its effectiveness in addressing operational issues. The perceived ease of use is dependent on the company's comfort with the technology and its ability to sustain the change or adoption of blockchain technology (Dua, 2023). In the context of blockchain technology, voluntariness can be defined as the strategic willingness to adopt its distinctive features. Such factors may include the firm's affinity for trust, transparency, robustness of the system, and interoperability. In addition, the analysis will take into account the firm's previous

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experience with the adoption of previous information technologies. As mentioned earlier, the influence of subjective norms remains unchanged. The image, however, represents the perception of clients and customers of the remaining technology updates. The relevance of the job in question will be consistent with the industry in question. The trust that blockchain can provide in terms of operational and financial output depends on the demonstrability of the quality of the output. The additional constructs indicate the social influence process and cognitive instrumental processes. Social influence processes include subjective norms, voluntariness, and image, while cognitive instrumental processes include job relevance, output quality, and outcome demonstrability. The construct can be reflective or formative depending on the situation (Dua, 2023).

The advancement of technology acceptance models has been driven by the necessity to guarantee user satisfaction and to anticipate system success. It is conceptually appropriate to examine blockchain technology acceptance. This is because, according to the goals of the principles of accounting and financial reporting, information must have certain features to be applicable to users. Consequently, the positive effect of blockchain technology on the quality characteristics of information will confirm the usefulness of this technology in accounting and financial reporting. Furthermore, the use of technology acceptance models can explain the attitude towards accounting and automatic auditing from the perspective of technology.

Unified Theory of Acceptance and Use of Technology: The Unified Theory of Acceptance and Use of Technology (UTAUT) was developed by synthesizing eight models of information technology acceptance research, including the Theory of Reasoned Action (TRA), the Technology Acceptance Model (TAM), and the Motivational Model (MM). It also includes the Theory of Planned Behavior (TPB), which integrates the Technology Acceptance Model and the Theory of Planned Behavior, the Model of PC Utilization (MPCU), the Innovation Diffusion Theory (IDT), and the Social Cognitive Theory (SCT). As a result, this theory is very comprehensive and is referenced in the seminal work of Venkatesh et al. (2003).

As proposed by Venkatesh et al. (2003), Performance Expectancy, Effort Expectancy, and Social Influence are believed to exert influence on Behavioral Intention in the context of technology usage. Conversely, the UTAUT model posits that Behavioral Intention and Facilitating Conditions determine Use Behavior. Additionally, individual difference variables, including age, gender, experience, and voluntariness of use, were formulated to serve as moderating factors in the aforementioned relationships.

The model describes four constructs of technology use: performance expectancy, effort expectancy, social influence, and facilitating conditions (Dua, 2023). Bouten extended the explanatory power of the UTAUT model by integrating the compatibility beliefs proposed by Karahanna and Agarwal into the original UTAUT model developed by Venkatesh and Morris. In addition, the model aims to elucidate the processes by which the cognitive phenomena of the UTAUT model are generated by developing and testing novel boundary conditions (Prashant Dongre, 2022). The objective of UTAUT2 is to expand the scope of UTAUT by incorporating considerations of the consumer use context, thereby providing a more comprehensive framework for understanding the factors influencing technology adoption. This permits a more detailed and sophisticated comprehension of the elements that shape the adoption of technology. This is particularly important given the observed discrepancies between consumer and organizational contexts. The UTAUT2 model introduces three additional constructs to the original UTAUT model: Hedonic Motivation (HM), which can be defined as the enjoyment derived from using the technology; Price Value (PV), which represents the consumer's cognitive trade-off

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between the perceived benefits of the application and the monetary cost of using it; and Social Influence (SI), which represents the degree to which individuals are influenced by the opinions of others in their social networks. This construct was excluded from the questionnaire because participants lacked the necessary knowledge about the cost of the technology. The habit (HB) construct represents the learning curve and the extent to which learning automates the tasks to be performed with the technology. It is also equated with automaticity by Venkatesh et al. (2020).

The disparate compatibility beliefs proposed by Karahanna et al. (Karahanna, Agarwal, and Angst, 2006) and the UTAUT model developed by Venkatesh et al. were synthesized by Bouten in 2008 to create the C-UTAUT model. The term "compatibility beliefs" is defined as the degree to which a new system is aligned with an individual's preferred work style, existing work practices, prior experience, and values. This model aims to provide a comprehensive analysis of the cognitive aspects of the UTAUT model, with a particular focus on the influence of recognizing and evaluating new limitations (Bouten, 2008).

In the context of blockchain technology, performance expectancy can be defined as the confidence that the adoption of blockchain will achieve the desired objective for which stakeholders have adopted it. Effort expectancy, on the other hand, is the confidence that the organization will effectively manage and use the blockchain. Social influence in blockchain can be thought of as analogous to peer pressure, which an organization experiences and confirms is necessary. Enabling conditions for blockchain can be defined as the availability of service providers that support and/or guide the blockchain transformation (Dua, 2023). Blockchain technologies currently require some technical background so it is expected that habit affects intention to use and adopt positively. The defined constructs are expected to be moderated by the variables: age, gender, and experience; with experience being the occasion to use a technology that varies since the system was used for the first time (Venkatesh et al, 2003). Moreover, with regard to the issue of compatibility, it is possible to make reference to the compatibility of this technology with existing expectations, current work procedures, professional experiences, and values.

Technology Readiness Acceptance Model: Lin (2007) sought to construct a model that integrated the Technology Acceptance Model (TAM) and the Theory of Reasoned Action (TRA) to elucidate user acceptance of technology-based electronic services. This integrated model is based on the two dimensions of perceived usefulness and perceived ease of use and is based on the Technology Readiness Acceptance Model (TRAM).

TRAM combines the general dimensions of TRI with the specific dimensions of TAM system to explain how individual readiness can affect individual interaction, experience, and use of new technology (Khadka & Kohsuwan, 2018). TRAM can explain how the personality dimension can affect a person in their interactions using new technology (Lin & Sher, 2007). Therefore, TRAM is widely used in research to determine the readiness and acceptance of an information system (Aripradono, 2021). In TRAM, there are seven variables: optimism, innovativeness, uncertainty, discomfort, perceived usefulness, perceived ease of use, and intention to use (Aripradono, 2021). TRAM is used to determine the impact of readiness on IT adoption in organizations because the factors that motivate an individual's inclination to use a system (intention to use) are shaped by perceived usefulness and perceived ease of use (Davis, 1989).

Task-Technology Fit: The Task-Technology Fit (TTF) model was developed by Goodhue and Thompson (1995) to explain technology use by examining the fit of the technology to the user's tasks/requirements. Unlike other prior research, which had mainly focused on the antecedents of use and intention, the TTF was the first theory to aim

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to explore the post-adoption aspect of technology utilization.

The Task-Technology Fit (TTF) acceptance model proposes that users will accept a new technology if it is sufficiently efficient in performing the tasks they perform on a daily basis. In this sense, the acceptance of the new information system depends largely on the user's daily routine tasks (Goodhue & Thompson, 1995). The degree to which the task at hand and the technological support provided to accomplish it are aligned is a critical determinant of the overall success of the system. In the TTF model, task-technology fit is defined as the extent to which the functionality of a technology matches the requirements of a task and the capabilities of the individual performing the task. The model uses four concepts: task characteristics, technological characteristics, task-technology fit, and use and acceptance. The task characteristics and technological characteristics serve to determine the task-technology fit, which in turn leads to the acceptance and use of the information system (Goodhue & Thompson, 1995). The TTF analysis shows that blockchain characteristics of transparency, immutability and programmability are very useful for addressing the tasks that need to be performed while meeting user needs. However, additional characteristics, such as automation, user-experience design, and communication support also need to be provided (Chaudhuri et al., 2022).

Model of Acceptance with Peer Support: This model is one of the most comprehensive in the field and uses seven constructs: behavioral intention, system use, facilitating conditions, network density, network centrality, value network centrality, and value network density. The theory posits that an individual's social network with employees of an organization influences technology acceptance (Dua, 2023). The Model of Acceptance with Peer Support (MAPS) synthesizes previous research on individuals with relevant social network elements in a way that facilitates the extension of previous concepts. The authors propose that social relationships fall into two categories. The first category includes relationships in which employees seek help from their peers, which can facilitate the acquisition of knowledge about how to use the system. The second category refers to relationships in which employees provide assistance to their colleagues, thereby enhancing their understanding of system configuration and deployment (Prashant Dongre, 2022). In their 2009 study, Sykes and colleagues identified two distinct categories of social connections between employees and others in the context of technology use. One of these connections is seeking help from other employees, while the other is providing help to other employees. The first of these is referred to as the "get help" type, while the second is referred to as the "give help" type. These are extended as value network centrality and value network density. The concept of value network centrality is based on the premise that a focal employee has control over system-related resources. In contrast, value network density refers to the degree of connectivity between the focal employee and other individuals. The degree of control has been shown to influence a number of key network-related variables, including value network density, the dissemination of information, the acquisition of knowledge, and other tangible resources that facilitate the functioning of the network. Behavioral intention is defined as the likelihood that an individual will engage in a particular behavior in a given context. System Usage is used to describe the extent to which a particular technology or product is used. It represents the expected frequency and duration of technology use. Enabling conditions are defined as beliefs about the supporting infrastructure associated with the use of the technology. Network density is described as the connectedness of the network and is defined as the number of connections in the network relative to the maximum number of connections.

In the context of blockchain technology, behavioral intention can be defined as the likelihood that an organization will adopt

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blockchain applications. System usage, on the other hand, refers to the adoption and enabling conditions of blockchain technology by end users. The enabling conditions depend on the availability of the technology at affordable prices and the capabilities of the provider offering the blockchain transformation. The term "network density" is defined as the percentage of peers using blockchain technology. The value of a network's centrality for blockchain is determined by the perception of customers and peers that blockchain is a critical component for maintaining business operations. The value of a network's density for blockchain is indicated by its adoption by other value creators, such as suppliers, distributors, and other value creators (Dua, 2023).

Initial Trust Model: The initial trust model (ITM) was defined by Kim and Prabhakar (2004) as "the intention of customers to use trust to satisfy needs in the absence of experience or reliable, detailed information". Building on this concept, Kim et al. (2009) developed the ITM, which posits that initial trust in m-banking can be explained by three factors: structural assurance, personal propensity to trust, and firm reputation.

As a fundamental element of ITM, structural assurance (SA) can be defined as the perceived legal and technical protection of specific users (Mahfuz et al., 2016) and its influence on initial trust. In the context of digital currency transactions, the initial trust experienced by individuals is shaped by the dual role of relevant government agencies, industry regulations, social oversight, and contractual agreements. In the context of monetary transactions, the need for structural assurance is particularly evident. The emergence of a novel money market has made digital currency payments vulnerable to a variety of risks. In particular, due to the lack of direct experience, users tend to view structural assurance as a critical factor prior to the adoption of digital currency payments that influences initial trust (Kim and Prabhakar, 2004). Structural assurance directly affects initial trust and emerges as a dominant antecedent of initial trust, thereby increasing the intention to use the technology. Initial trust is enhanced when users perceive or receive structural assurance.

The term "personal propensity to trust" is used to describe the degree to which an individual is predisposed to place trust in other individuals with whom they have established a close relationship in a variety of circumstances (McKnight et al., 2002). The term "personal trust propensity" is used to describe the degree to which an individual is inclined to rely on other individuals with whom they have established a close relationship in a variety of situations (McKnight et al., 2002). A higher propensity to trust technology has been shown to result in a significant increase in users' trust intensity (McKnight et al., 2002). Personal trust propensity is an attribute, characteristic, and experience that is shaped by a person's cultural background and psychological education (Lee and Turban, 2001). In the absence of prior knowledge, users with a higher propensity to trust may assume that services are reliable.

The term "corporate reputation" is defined as the firm's ability to provide efficient service to users and the reliability of users' participation in the firm's transactions (McKnight et al., 1998). The term "corporate reputation" encompasses the firm's ability to provide services, the reliability of its business activities, and the reputation of the firm itself (McKnight et al., 1998). As a result, a significant number of high-profile firms proactively provide after-sales support to consumers, disseminate information promptly, and emphasize their technological expertise. They also encourage customers to trust the company's extensive technical capabilities and unparalleled competitive advantage. This enhances the initial trust in the business operation platform (Wu and Lee, 2017).

Convenience, flexibility, and perceived benefits, such as the role of service efficiency, are associated with the formation of initial trust (Koufaris & Hampton-Sosa,

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2004). In cases where users have minimal or no experience and are considering accepting novel services, initial trust is of paramount importance (Kim, Shin, & Lee, 2009). The role of initial trust in e-commerce is associated with areas such as online shopping (Lowry, Vance, Moody, Beckman, & Read, 2008) and mobile banking services (Mallat, Rossi, & Tuunainen, 2004), where extensive research has been conducted. Considering the above factors, the elements that contribute to the formation of trust in the acceptance and use of blockchain and process automation technology can be observed in relation to performance expectations, facilitating conditions, legal and technical assurances, risk-taking propensity and an individual's propensity to trust, advertising, and the reputation of the technology in question.

Ethics code of conduct for professional

The fundamental factors that ensure the growth and expansion of professions such as accounting and auditing are professional ethics and a code of conduct. Ethics can be defined as a set of principles that serve as a guiding framework for professional conduct, with the objective of meeting the expectations of the wider society or relevant stakeholders. The fundamental principles of professional ethics in accounting are as follows: 1) Integrity, 2) Impartiality, 3) Competence and professional care, 4) Confidentiality, 5) Professional conduct, 6) Professional principles and rules.

The blockchain platform is characterized by a number of key features, including decentralization, distributed databases, distributed ledgers, peer-to-peer communication, and synchronous networks. These features align with automated accounting and auditing practices, which facilitate transparency, justice, fairness, and equality by eliminating or reducing ambiguity, uncertainty, conservatism, secrecy, information asymmetry, a lack of conflict of interest, and providing access to stakeholders. These cases are founded upon ethical and human principles that serve as the bedrock of all disciplines of knowledge, including accounting and auditing. Furthermore, the platform eliminates the need for intermediaries, authenticates individuals, directly detects transactions, and immediately registers events. Furthermore, the platform utilizes logical reasoning, robust calculation algorithms, objectivity, network integrity, the irreversibility of transactions, the immutability of documents, verifiability, traceability, and the completeness of information. Blockchain technology enables the fulfillment of ethical principles, including integrity, honesty, impartiality, independence, competence, professional care, professional behavior, and the reduction of moral risk. This, in turn, engenders trust and reassurance. Furthermore, the platform incorporates a number of additional features, including cloud storage, cybersecurity, information security, differentiated access, system integrity, non-repudiation, ownership verification, smart contracts, cryptography, tamper resistance, distributed information, consensus mechanisms, and control consolidation. Furthermore, blockchain technology facilitates compliance with the principles of care and confidentiality, thereby providing security for the beneficiaries.

The most advanced technologies, including artificial intelligence, the Internet of Things, big data, and cloud computing, are employed in conjunction with the distinctive characteristics of blockchain. This combination of technologies, algorithms, and rigorous logical calculations ensures the highest possible accuracy and quality in the collection, processing, recording, and reporting of information. Moreover, blockchain's potential for transformation allows it to operate at a high level of efficiency. Moreover, it is crucial to possess a certain degree of knowledge and awareness. Consequently, accountants and auditors are obliged to obtain the requisite knowledge and enhance their professional abilities in accordance with the digital transformation. In order to fulfill the primary objective of accounting and auditing, which is to assist stakeholders in decision-making, it is imperative that these professions remain

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informed of the latest developments in the business world. This necessitates not only the acquisition of the requisite knowledge but also the guarantee that the operational capacity of accountants and auditors is not constrained by outdated practices. The objective is to enhance their analytical capabilities and fulfill their responsibilities in a more effective manner. This issue pertains to the ethical principles of competence, care, and professional conduct in accounting.

Methodology

The majority of existing studies have concentrated on the technical aspects of blockchain, and thus far, no comprehensive scientific framework has been established for this technology. In this context, this research endeavors to provide a theoretical, conceptual, and ethical framework that elucidates the most significant impact of blockchain technology on accounting and auditing.

This research uses a teleological methodology. This research has two primary objectives: first, to expand the existing body of knowledge, and second, to fill the identified knowledge gap. To achieve this goal, a systems approach was used in the modern approach to Future Technology Analysis (FTA). This approach was used to examine the fundamental principles underlying blockchain technology and its applications in accounting and auditing. This topic is aligned with the premise of automated accounting and auditing in the context of blockchain technology, which is of significant interest for two main reasons. First, the topic under study is innovative. Second, it has an international scope and the potential for scientific and practical applications. The conceptual, theoretical, and ethical framework of the topic was designed and explained based on a content analysis of 137 scientific, reference, and library sources available in the Elsevier and Web of Science databases. This analysis was conducted using Atlas.ti v9 and ConceptDraw software.

In order to achieve the knowledge and epistemic objectives that arise from the processes of automatic accounting and auditing within the context of blockchain technology, it was first necessary to conduct an examination of the fundamental concepts that underpin the research topic. Based on this examination, a conceptual model of the research was then developed. The conceptual model was based on four core topics: accounting, auditing, blockchain technology, and automation systems. Subsequently, a comprehensive examination was conducted of all pertinent theories, perspectives, frameworks, and methodologies. This analysis enabled the clarification of the theoretical framework that underlies the research. The theoretical model was constructed on the foundation of 38 pertinent, efficacious, and pervasive interdisciplinary theories and models in the domains of finance, accounting, and auditing. Of the 26 theories identified, 24 were deemed to be distinct and unique, upon which the theoretical framework was constructed. Finally, the key features of the research subject were examined in the form of six vital ethical concepts affecting social, economic, cultural, and political issues, as well as the ethical model.

Results

Conceptual Framework of Automated Accounting and Auditing in the Platform of Blockchain Technology

The analysis of literature and research dimensions in the general conceptual model permits the construction of a mental map derived from cellology, or the so-called neural network in this research. This map is presented in the figure below.

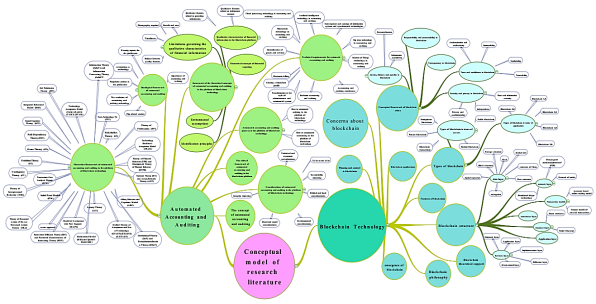

Figure 1. *Conceptual model and mind map of research literature. Source: Authors. (Concept Draw)*

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The results of accounting, automatic auditing, and blockchain technology as the primary networks and vital components of this phenomenon encompass a multitude of scientific, practical, and philosophical aspects of scientific and practical events.

Theoretical Framework of Automated Accounting and Auditing on the Blockchain Technology Platform

A review of the existing literature on the subject revealed the existence of 38 interdisciplinary theories and models related to effectiveness and impact in finance, accounting and auditing. Of the total number, 26 were identified as pure and distinct from the others. The figure below illustrates the theoretical framework that emerged from the research.

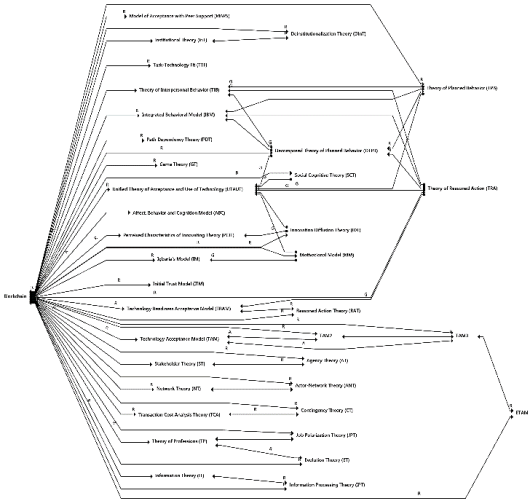

Figure 2. *Theoretical connections of Automated Accounting and Auditing on the Blockchain Technology Step 1. Source: Authors. (Atlas. ti v9)*

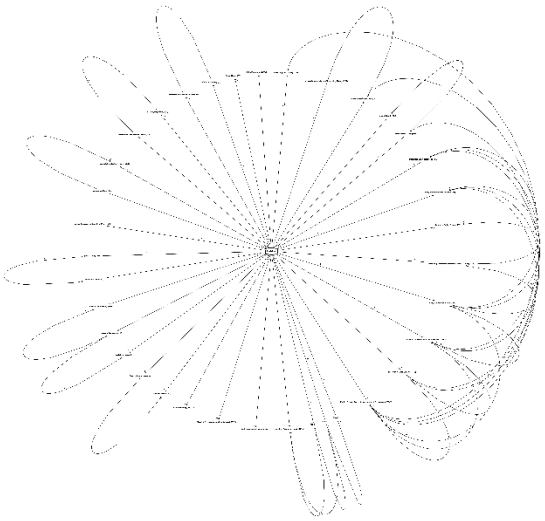

Figure 3. *Theoretical connections of Automated Accounting and Auditing on the Blockchain Technology Step 2. Source: Authors. (Atlas. ti v9)*

The figure below illustrates the initial theoretical framework that emerged from this analysis, based on the aforementioned approach.

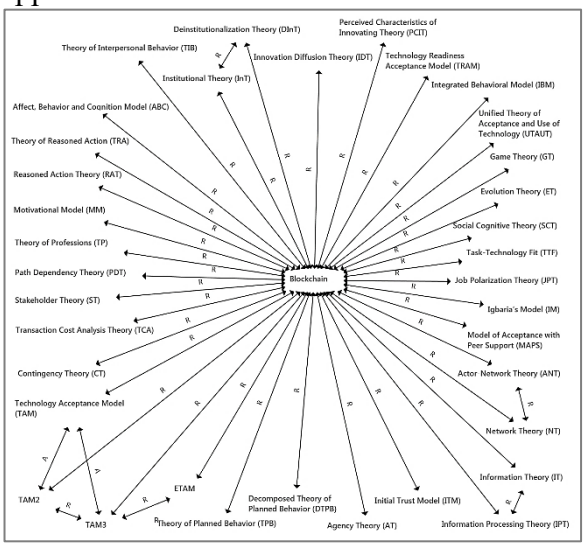

Figure 4. *The explanatory theoretical framework of accounting and auditing in the context of blockchain technology. Source: Authors. (Atlas.ti v9)*

This model incorporates a multitude of elements, including processes, instruments, sentiments, convictions, attitudes, motivations, circumstances, value, importance, necessity, dependence, proclivities, individual factors, social factors, economic factors, political factors, contextual factors, and professional principles within the

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domains of financial, accounting, and auditing. These factors extend across the past, present, and future. Subsequently, in order to facilitate a more comprehensive and useful understanding of the theoretical framework, it was ordered and structured. The resulting model of the theoretical framework from the research is illustrated in the figure 5.

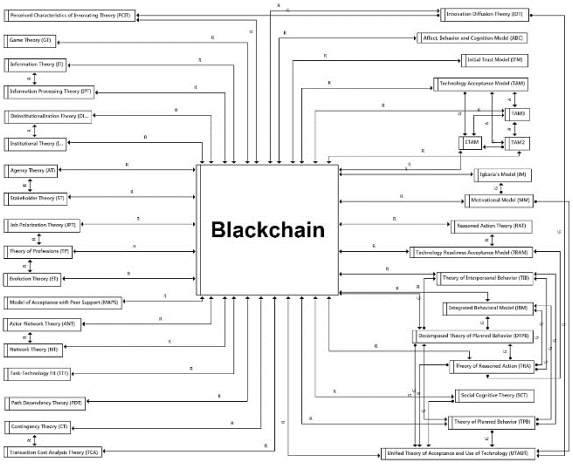

Figure 5. *Theoretical framework of blockchain technology. Source: Authors. (Atlas. ti v9)*

The framework developed in this study is based on an analysis of society's norms, expectations, and demands, as well as an assessment of the characteristics and performance of blockchain technology. It encompasses numerous technical, cultural, social, economic, political, and contextual factors from a mixed perspective and with a systemic approach.

Ethical Framework of Automated Accounting and Auditing in the Platform of Blockchain Technology

A comprehensive search and review of 137 study sources available in the Elsevier and Web of Science databases yielded 46 related study titles. The monitoring and coding of the extracted sources in the Atlas.ti software revealed the presence of 19 distinct and noteworthy features. The study sources were found to include the following elements: encryption, smart contracts, elimination of intermediaries (direct transmission), integrity (system stability), hashing (reproducibility), authentication, record keeping (secure storage), immutability (irreversibility), access, non-repudiation, consistency, verifiability, traceability (control), digital signature, information asymmetry, peer-to-peer network, decentralization (shared), consensus mechanisms, and distributed ledger. Each of these topics is based on the content analysis of the citation sources and their convergence based on the vital and effective ethical concepts of responsibility and accountability, transparency and disclosure, justice and equality, trust and confidence, security and privacy, guidance, planning and control, flexibility, and relevance. The data was organized and structured. Figure 6 illustrates the network-oriented communication structure resulting from the coding of the ethical components of blockchain technology in the Atlas.ti software.

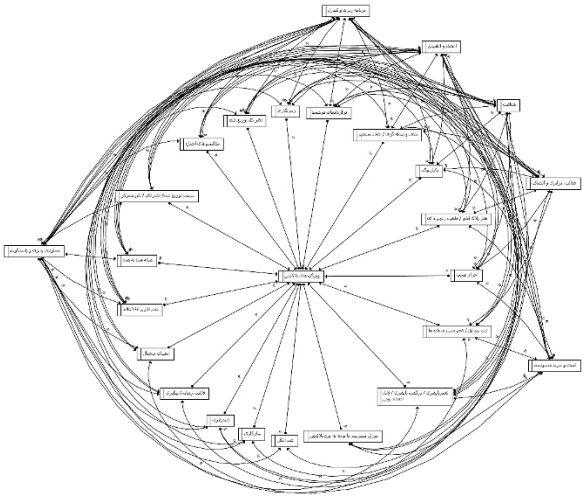

Figure 6. *Communication network of ethical components of blockchain technology. Source: Authors. (Atlas. ti v9)*

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In order to facilitate comprehension of this communication network, its structure was summarized and classified in the following sections. The figure below depicts the final conceptual model of the blockchain ethical framework that emerged from this research.

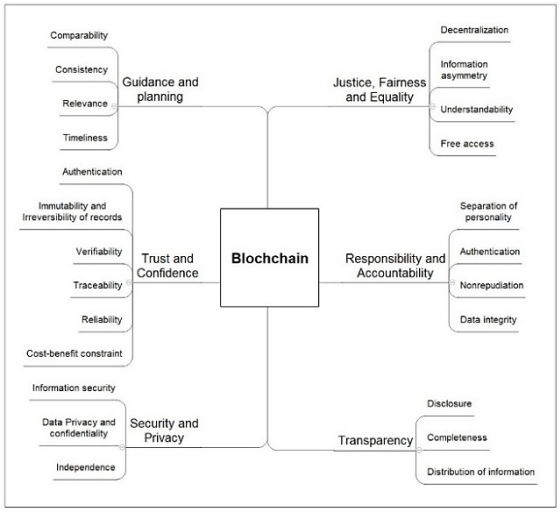

Figure 7. *Ethical framework of blockchain in finance, accounting and auditing. Source: Authors. (Atlas. ti v9)*

A comprehensive overview of the model's contents has been meticulously prepared and is presented below for your consideration. 1) Responsibility and accountability: The separation of personality; authentication and authenticity; non-denial; integrity, 2) Transparency and disclosure: Disclosure; completeness; information distribution and distributed ledger, 3) Justice and equality: Information asymmetry; lack of concentration; distributed, comprehensible; public and private access, 4) Trust and confidence; immutability; irreversibility; verifiability; traceability; reliability; increasing benefits over costs, 5) Security and privacy: information security; independent; elimination of intermediaries; confidentiality of data, 6) Direction, planning and control: comparability; consistency; uniformity; relate; timeliness was explained and classified.

Discussion and Conclusions

The future of research and systems thinking in new technologies is of great importance for the strategic planning and strengthening of future areas of focus. The capabilities, power, and high growth rate of technologies have enabled profound technical, economic, and social developments over recent years. These developments have given rise to a phenomenon that may be termed "digital neo-Darwinism." Meanwhile, blockchain technology represents one of the most significant innovations to emerge from social demand. Blockchain technology represents a natural response to several global factors and needs that have given rise to a new social concept, influencing the way people live, interact, and communicate, as well as business processes. The pinnacle of this phenomenon's manifestation and penetration in the domains of accounting and auditing can be regarded as a platform that automates accounting and auditing processes. This critical issue has resulted in substantial transformation and advancement in the domains of information systems, credit, and reporting. The significance, necessity, and international scope of this phenomenon have prompted an investigation into the recognition and explanation of its concepts and scientific framework, with the aim of ascertaining its true nature and scope.

The results of the content analysis conducted in this study present a structured model based on the characteristics and potential applications of blockchain technology. This model incorporates fundamental principles and a diverse range of scientific disciplines.

The results of the literature analysis and the research findings, as presented in the conceptual model, indicate that automated accounting and auditing, in conjunction with blockchain technology, represent the primary network and vital veins of the phenomenon of domestication. These elements encompass a multitude of scientific, practical, and philosophical dimensions pertaining to events and activities. Blockchain technology represents a novel distributed infrastructure based on the principles of registration, distribution, encryption, consensus, and modern intelligence in a chain of data and

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information. It is an organized base with a structure of multiple layers, including a data layer, network layer, consensus layer, contract layer, service layer, and application layer. In addition, the potential to leverage and derive value from other emerging technologies (such as cloud computing, internet of things, artificial intelligence, big data, etc.) has the potential to replace the traditional process of information flow and system automation, thereby completely transforming and automating the accounting information and audit process. The accounting and auditing professions will be accompanied by a convergence and synergy with new technologies, a transformation in the style of administrative systems and bureaucracy, and we will witness accounting and auditing with stability, integrity, continuity, and online and in real time. This will be in accordance with the theoretical concepts of financial reporting, accounting and auditing standards, laws and regulations, and the needs of society.

The results of the literature analysis and research findings as a theoretical framework indicated that automated accounting and auditing on the blockchain platform is a set of processes, tools, emotions, feelings, beliefs, attitudes, motives, conditions, values, importance, necessity, dependence, preferences, personal, social, economic, political, contextual factors, and professional principles in finance, accounting, and auditing related to blockchain technology in the past, present, and future.

The fundamental factor that drives the growth and expansion of any profession, including accounting and auditing, is a commitment to a code of professional ethics. In light of these considerations, it is clear that the ethical implications of blockchain technology are also relevant to the fields of accounting and auditing. The fundamental principles of ethics and professional conduct are set forth in various statements by the International Federation of Accountants (IFAC) and other esteemed accounting organizations, though the specific terminology may vary. Nevertheless, the fundamental concept is consistent across all of these definitions. The aforementioned principles are applicable to all professional accountants and are as follows: The following six principles serve as the foundation for the ethical conduct of accountants: integrity, impartiality, competence and professional care, confidentiality, professional behavior, and professional principles and rules. The blockchain architecture allows for the straightforward fulfillment of numerous approved accounting professional ethics standards. The evidence presented herein demonstrates that the blockchain platform is capable of encompassing accounting principles and ethical standards.

The blockchain platform is distinguished by a number of key features, including decentralization, distributed databases, distributed ledgers, peer-to-peer communication, and synchronous networks. These characteristics are consistent with the principles of automated accounting and auditing. These features facilitate transparency, justice, fairness, and equality by eliminating or reducing ambiguity, doubt, conservatism, secrecy, information asymmetry, a lack of conflict of interest, and providing access to stakeholders. This access is based on ethical and human principles in all fields of knowledge, including accounting and auditing. The elimination of intermediaries, authentication of persons, direct detection of transactions, immediate registration of events, robust logic and algorithms, objectivity, network integrity, irreversibility of transactions, immutability of documents, verifiability, traceability, and completeness of information are additional features of the blockchain platform that facilitate compliance. The ethical principles that underpin the practice of this profession are as follows: integrity, honesty, impartiality, independence, competence, professional care, professional behavior, and the reduction of moral risk. These principles engender trust and reassurance in the public. In addition, the platform incorporates a number of other features, including blockchain cloud storage, cyber security,

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information security and privacy with differentiated access, system integrity, non-repudiation, ownership verification, smart contracts, cryptography, tamper resistance, distributed information, consensus mechanisms, and control consolidation. The blockchain provides a mechanism for ensuring compliance with the principles of care and confidentiality, thereby offering a secure environment for beneficiaries. The most advanced technologies, including artificial intelligence, big data, internet of things, and cloud processing, are employed in conjunction with the unique features of the blockchain. This enables the collection, processing, recording, and reporting of information with the utmost precision and quality, due to the combination of blockchain algorithms and meticulous logical calculations. Furthermore, the blockchain necessitates a specific comprehension and awareness, given its elevated throughput and transformation capabilities. Consequently, accountants and auditors are required to obtain the necessary knowledge and enhance their professional abilities with regard to digital transformation. In order to fulfill the primary objective of accounting and auditing, which is to assist stakeholders in decision-making, it is imperative that these professions remain informed of the latest developments in the business world. This is in accordance with the professional principles that govern their practice, allowing them to identify and address any deficiencies in their operational capabilities and analytical abilities, thereby fulfilling their expanded responsibilities. This case study illustrates the ethical principles of competence, care, integrity, and professional conduct in accounting.

Although the contemporary world is familiar with change and transformation, the liberation from a traditional approach that has been woven into the fabric of the economic, political, cultural, and social information systems of societies for many years has brought with it an educational and knowledge approach. This is not a simple matter. Based on this, examining the various aspects of this transformative issue is a necessity in the current sensitive times. This issue can be an important suggestion for future research.

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