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UNDERSTANDING BLOCKCHAIN TECHNOLOGY ADOPTION IN ORGANIZATIONS: THE EFFECT OF FOMO

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Understanding Blockchain Technology Adoption in Organizations: The Effect of FOMO

Abstract: Blockchain technology was initially introduced in 2008, and since then, it has attracted the interest of both scholars and industry professionals. This technology has a set of different applications across various business sectors, including cryptocurrency, supply chain management, human resources management, the music industry, real estate management, and beyond. Despite the increasing interest in blockchain, the body of literature on the subject remains relatively emerging and limited. This research aims to explore the adoption of blockchain technology within organizations, particularly focusing on how the psychological concept of FOMO (Fear of Missing Out) influences decision-making among managers. By investigating barriers and motivational factors impacting these managers' decisions regarding blockchain adoption, the study seeks to provide deeper insights. The research addresses a significant gap in the field: the need for a comprehensive, empirically tested model that explains the factors influencing blockchain technology adoption at the organizational level. To build this model, the study has integrated insights from institutional theory, the Technology-Organization-Environment (TOE) framework, and the FOMO concept. The research was conducted through surveys targeting private organizations in the financial sector in Turkey. The results of the research show the effect of institutional powers, FOMO, technological, and organizational factors on blockchain adoption intention and blockchain use in these organizations.

Keywords: Technology adoption, Institutionalization Powers, Institutional theory, FOMO effect, TOE theory, Blockchain.

ORGANİZASYONLARDA BLOCKCHAİN TEKNOLOJİSİNİN Kabulünü Anlamak: FOMO'nun Etkisi

Özet: Blokzinciri teknolojisi ilk olarak 2008 yılında tanıtıldı ve o zamandan beri hem akademisyenlerin hem de sektör profesyonellerinin ilgisini çekti. Bu teknoloji, kripto para birimi, tedarik zinciri yönetimi, insan kaynakları yönetimi, müzik endüstrisi, gayrimenkul yönetimi ve daha birçok iş alanında çeşitli uygulamalara sahiptir. Blokzincirine olan ilginin artmasına rağmen, konuyla ilgili literatür nispeten yeni ve sınırlıdır. Bu araştırma, blok zinciri teknolojisinin organizasyonlar içinde kabulünü keşfetmeyi amaçlamakta, özellikle yöneticilerin karar alma süreçlerinde psikolojik bir kavram olan FOMO'nun (Fırsatları Kaçırma Korkusu) nasıl bir etkisi olduğunu incelemektedir. Yöneticilerin blokzinciri benimseme kararlarını etkileyen engelleri ve motivasyonel faktörleri araştırarak, çalışma daha derinlemesine içgörüler sağlamayı hedeflemektedir. Araştırma, alanında önemli bir boşluğu ele almaktadır: organizasyon düzeyinde blok zinciri teknolojisi benimsemesini etkileyen faktörleri açıklayan kapsamlı, ampirik olarak test edilmiş bir modele duyulan ihtiyaç. Bu modeli oluşturmak için çalışma, kurumsal teori, Teknoloji-Organizasyon-Çevre (TOE) modeli ve FOMO kavramından elde edilen içgörüleri entegre etmiştir. Araştırma, Türkiye'deki özel finasal sektör kuruluşlarını hedef alan anketler yoluyla gerçekleştirilmiştir. Araştırmanın sonuçları, kurumsal güçlerin, FOMO'nun, teknolojik ve organizasyonel faktörlerin blokzinciri benimseme niyeti ve blokzinciri kullanımı üzerindeki etkisini göstermektedir.

Anahtar Kelimeler: Teknoloji Kabülü, FOMO’nun Etkesi, Kurumsal Teorisi, Teknoloji - Organizasyon - Çevre Modeli, Blokzincir.

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Maryam A. Aljamal

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LIST OF ABBREVIATIONS

CFA: Confirmatory Factor Analysis

CFI: Comparative Fit Index

dF: Degree of Freedom

DOI: Diffusion of Innovation Theory

EFA: Exploratory Factor Analysis

FOMO: Fear Of Missing Out

KMO: Kaiser-Meyer-Olkin Criterion

RMSEA: Root Mean Square Error of Approximation

SEM: Structural Equation Modeling

SRMR: Standardized Root Mean Square Residual

TAM: Technology Acceptance Model

TIC: Technological Innovation Capabilities

TLI: Tucker-Lewis Index

TOE: Technology- Organization- Environment Model

TPB: Theory of Planned Behavior

TRA: Theory of Reasoned Action

TTF: Task Technology Fit Theory

UTAUT: Unified Theory Of Acceptance And Use Of Technology

1 INTRODUCTION

This chapter is dedicated to providing a brief introduction to the subject of this dissertation. Blockchain technology has emerged as one of the most transformative innovations of the 21st century, fundamentally altering the way transactions and data are managed across various sectors. Characterized by its decentralized, transparent, and secure nature, blockchain technology offers numerous advantages, including enhanced security, reduced fraud, improved efficiency, and greater transparency (Dos Passos, Matteussi, Dos Anjos, & Geyer, 2024). These features make it particularly relevant for the financial sector, where the integrity and security of transactions are principal.

This dissertation focuses on understanding the factors influencing the adoption of blockchain technology in private financial organizations within Turkey. The Turkish financial sector is a vital component of the national economy, characterized by a robust banking system, and a regulatory environment that is gradually evolving to accommodate technological advancements (Erol, Ar, Ozdemir, Peker, Asgary, Medeni, & Medeni, 2020). Despite these favorable conditions, blockchain adoption has not been as widespread as anticipated. Understanding the barriers and drivers specific to this context is essential for promoting broader adoption and realizing the potential benefits of blockchain technology. These issues will be explored in greater detail in the following sections.

1.1 Aims and Objectives

The purpose of this research is to reveal adoption factors of blockchain technology in organizations, especially private organizations in the financial sector in Turkey. Moreover, this study aims to study the factors that lead decision makers in organizations to decide to adopt blockchain technology in their organization by inspecting the possible effect of FOMO (Fear of Missing Out).

This study will be based on institutional theory and TOE model (Technology-Organization-Environment model). At the part of institutional theory, the focus will be on powers of institutionalization as they will be used to explain the factors and pressures of institutional environment that might be leading decision makers to adopt new technology. However, in existing literature the TOE model has been used to explain the group of technological, organizational, and environmental factors that are behind adopting new technology. Institutional theory bridges the gap in TOE model by explaining that organizational decisions are based on social and cultural factors in addition to rational factors (Oliveira & Fraga, 2011).

The core problem addressed by this research is the limited adoption of blockchain technology in private Turkish financial organizations, despite its clear advantages and the global trend towards digital transformation. Identifying and understanding the factors that influence adoption decisions is crucial for developing strategies that can accelerate the integration of blockchain into the financial sector. This research aims to explore these factors using established theoretical frameworks, providing a comprehensive analysis that can inform both practitioners and policymakers.

Moreover, this study aims to take a closer look at the factors that might be affecting decision makers in organizations to adopt new technology by studying both institutionalization powers and FOMO effect. FOMO has been discussed in the literature widely as a situation where in individuals feels afraid of missing out possible benefit or possible enjoyment resulted of having something that one's don't have, this thing might be a social event, new product, or technology (Przybylski, Murayama, DeHaan & Gladwell, 2013; Zhang, 2018). FOMO has negative consequences as it might result in spending time, money, or effort on technology that might not really be needed or beneficial. This will help practitioners in a business environment to be aware of the different affecting factors to measure the viability of taken decisions.

On the other side, the existing literature studied adoption factors of new technologies extensively both on individual level and organizational level. And a set of frameworks where suggested, tested, and used in the purpose of understanding adoption factors (Janssen et al, 2020; Kusuma et al, 2020; Saurabh & Dey, 2021). However, a smaller number of studies were dedicated

to study adoption factors at the organizational level compared to the number of studies that examined individual level. Based on that, this study is planned to build and test a model that is used to explain technology adoption factors at the organizational level, and blockchain technology is the technology of interest in this research.

In summary, this study has the following objectives:

• Study adoption factors of blockchain technology in organizations.

• Study institutionalization powers on organizations in the context of adopting new technology.

• Study the effect of FOMO on adopting new technology at the organizational level.

1.2 Subject & Scope

This study's subject is blockchain technology adoption in organizations. The scope of the study is private organizations in financial sector in Turkey. The financial sector has been at the forefront of exploring blockchain technology, with numerous applications such as secure transactions, smart contracts, and fraud prevention. Despite the global interest and the demonstrated potential of blockchain technology, its adoption in different regions and sectors varies significantly. In Turkey, the financial sector represents a critical area for blockchain adoption, given its dynamic and rapidly evolving nature. However, the adoption rate of blockchain technology in private Turkish financial organizations remains limited, presenting a significant research opportunity.

Moreover, institutional theory, TOE, and FOMO will be discussed in this study. The subject of blockchain technology adoption in organizations is relatively new and it needs more research to study different adoption factors of this new technology. This will help organizations to understand the importance of the technology and the motives behind adopting it. Also, by understanding the motives for adoption, organizations will be able to take better decisions regarding investing in this technology. FOMO is hoped to provide explanations for the motives of decision makers while deciding to adopt new technology. At the same stream, institutional theory will better explain

factors and motives for blockchain adoption, which will help decision makers to understand the dimensions of these decisions.

In this area of research, a gap was identified; quantitative study for the factors of blockchain adoption in organizations is needed (Malik, Chadhar, Chetty & Vatanasakdakul, 2020). Beside quantitative study, applying FOMO to the context of management and business administration will provide more insights to understand technology adoption in organizations.

Research questions of this study:

RQ1: What are the factors of blockchain technology adoption in organizations?

RQ2: What are the factors that affect organizations positively\negatively to adopt blockchain technology?

RQ3: What is the effect of FOMO on blockchain adoption intention in organizations?

1.3 Originality of the Study

This study is based on a review of the literature related to technology adoption in organizations, especially blockchain technology. This technology is relatively new as it was introduced in 2008. Due to that, there is limited knowledge and academic research related to it. This study takes into consideration the research gap mentioned by Malik, Chadhar, Chetty, and Vatanasakdakul (2020), that there is a need for developing a comprehensive research model related to blockchain technology adoption in organizations and testing it by applying quantitative approaches.

Moreover, borrowing FOMO from the field of psychology then applying and testing it to the field of technology adoption at the organizational level is new -up to our good knowledge-, and hasn't been applied before. This study aims to study FOMO in the context of technology adoption in organizations and exploring its effects on decisions taken in the organization. When managers in organizations are aware of the problem of FOMO it will help them to avoid any negative consequences that might result from unnecessary adoption of new technology.

This research contributes to the existing body of knowledge on blockchain adoption by providing insights specific to the Turkish financial sector. The findings have practical implications for decision-makers in financial organizations, helping them to develop strategies for successful blockchain adoption. Policymakers can also benefit from understanding the barriers and drivers, enabling them to create supportive regulatory frameworks. Additionally, the study offers theoretical contributions by applying and validating the TOE model in a new context.

In conclusion, this study is original in two ways: First, by introducing and testing a comprehensive model of blockchain technology adoption in organizations. Second, by testing the effect of FOMO at organizational level on adoption decisions.

The majority of the studies in the field of technology adoption were designed to examine different technology adoption factors at the individual level (Lee, 2014; Dzandu et al, 2016). Limited number of studies studied technology adoption factors at the organizational level. For this reason, the focus of theories and models developed and produced in this field is at the individual level. In this research TOE is the base for the research model, in addition to institutional theory that is used to better explain the environmental element in the TOE model.

1.4 Structure of the Dissertation

In this section the structure of this dissertation will be presented. The dissertation will be organized into six primary chapters which are introduction, theoretical background, research model, research methodology, data analysis, and results discussion and conclusions. In chapter one, the introduction of the subject of the dissertation, research scope and gap, and research goals and questions will be presented.

Chapter two is dedicated to setting the theoretical background of the research. Previous studies in the literature regarding blockchain technology, technology acceptance models, institutional theory, and FOMO will be discussed. Various models of technology acceptance have been presented in chapter 2. It’s important to understand the development and different views of technology acceptance theories in order to build a comprehensive research model.

Moreover, chapter three is dedicated to research model development, constructs, and research hypothesis. In chapter 4 the research methodology will be discussed. The status of blockchain technology in Turkey will be presented. In addition to that, measurement items and the survey development process will be presented.

More than that, in chapter 5 different analytical tests will be performed. After that, hypothesis results will be presented. And finally, in chapter 6 discussion and interpretation of results will be presented. In addition to that, limitations, practical and theoretical implications of the results will be explored. After that, the dissertation will be finalized by discussing future research directions and conclusions.

2 THEORETICAL BACKGROUND

In this chapter literature related to blockchain technology, technology adoption theories, institutional theory, and FOMO is studied. The main goal of this chapter is to understand the theoretical background of the study in order to best design the research model in the next chapter.

2.1 Blockchain Technology

2.1.1 Overview of Blockchain Technology

Blockchain, a new innovative technology introduced in 2008 (Dos Passos, Matteussi, Dos Anjos, & Geyer, 2024), has emerged as a foundation of the Industry 4.0 revolution. It functions as a digital ledger for recording transactions, employing distributed ledger technology distributed across network nodes in a decentralized manner. The evolution of Industry 4.0 and the developing business environment are centered around creating a decentralized environment to address trust-related establishments effectively. The ledger is structured in the form of interconnected blocks, hence the name "blockchain." Each transaction is carefully recorded on a separate block, holding labels to prevent any future alterations or deletions. This characteristic ensures that data stored on a blockchain remains immutable and secure (Sharad Mangrulkar, & Vijay Chavan, 2024). Consequently, blockchain technology is ready to reform various industries by enhancing transparency, security, and efficiency in transactional processes.

More than that, the academic debate surrounding blockchain technology is still growing and relatively emerging. While existing literature mainly explores the technical details of blockchain, there is a noticeable gap in addressing its adoption complexities within organizations. Consequently, there is considerable interest and significance in exploring this technology, its commercial applications, and its organizational acceptance (Dos Passos et al, 2024). Several studies have emerged examining the factors influencing the adoption of blockchain technology. These studies employ diverse methodologies, theories, and perspectives in an effort to comprehensively understand blockchain technology from an academic perspective. Furthermore, the majority of research on blockchain adoption has relied on secondary data sources. In contrast,

this dissertation seeks to contribute to this body of knowledge by utilizing primary data sources (Janssen, Weerakkody, Ismagilova, Sivarajah, & Irani, 2020; Vergouwen, Koens & Poll, 2020; Sharad Mangrulkar, & Vijay Chavan, 2024).

In addition to that, Blockchain fosters collaborative efforts among community members, as data is only added to the chain upon consensus approval from community members through consciences mechanisms. Its fundamental features enable innovative organizations to enhance collaboration across various sectors and entities. This collaboration is essential for the functioning of the distributed ledger. Usually, it involves the sharing of transaction information, consensus mechanisms, and data synchronization among the nodes (Chauhan, & Patel, 2022; Dos Passos et al, 2024). By adopting blockchain technology, organizations can establish transparent and trustworthy systems of record-keeping, facilitating seamless collaboration and information sharing among stakeholders. This promotes greater efficiency, accountability, and integrity in transactions and processes, ultimately driving positive outcomes for participating entities and contributing to the advancement of collaborative practices in diverse industries (Dos Passos et al, 2024). Moreover, In the context of the distributed ledger, collaboration ensures that all participating nodes work together to maintain the integrity and security of the blockchain network, validate transactions, and reach consensus on the state of the ledger (Lashkari, & Musilek, 2021).

More than that, consensus mechanisms play a critical role in ensuring the integrity and security of blockchain networks. Consensus mechanisms ensure that all nodes in the network agree on a consistent global state for the distributed ledger, thereby maintaining the integrity of the system. Consensus mechanisms in blockchain include but not limited to: Proof of Work (PoW), Proof of Stake (PoS), Practical Byzantine Fault Tolerance (PBFT), Delegated Proof of Stake (DPoS), and Proof of Authority (PoA). Another 130 mechanisms were discussed in a review paper by Lashkari and Musilek (2021). Moreover, consensus protocols verify that all transactions have an authorized source through agreement on the state of the ledger. Which results in ensuring the authenticity and security of network transactions. Also, consensus mechanisms enable non-faulty nodes to contribute to the production of value, ensuring the continuous operation and functionality of the network (Lashkari, & Musilek, 2021).

Information transparency is another important characteristic of blockchain technology that implies that information is available for everyone easily free of irregularities. Transparency means that information is available for everyone easily free of irregularities. In other words, transparency in blockchain refers to the openness and accessibility of the information stored on the distributed ledger (Centobelli, Cerchione, Del Vecchio, Oropallo, & Secundo, 2022). Information transparency makes information of business operations easily traceable. That's because every participant of blockchain system has the same copy of information, and any new transaction is approved through community consciences mechanisms. Moreover, Accessing transparent information can streamline processes, reduce disputes, and improve overall efficiency in various industries and applications. (Viriyasitavat & Hoonsopon, 2019). Malik et al (2021) reported a positive effect of Information transparency over blockchain technology adoption in organizations. They also concluded that Blockchain enables organizations to have transparent access to information across the network, and to have a transparent view of any activity in the data, besides having a transparent flow of the entire data.

Furthermore, blockchain enables transparency in transactions across various business units, enhancing visibility and accountability. It also extends the way for the active utilization of enterprise applications. Additionally, blockchain presents a countless of opportunities for businesses, accelerating the automation process, revolutionizing operational methodologies, and enabling operations to be conducted independently of third-party organizations (Pal, Tiwari, & Haldar, 2021; Xuan, & Ness, 2023). By embracing diverse blockchain applications, companies of all scales and industries can securely communicate, collaborate, and exchange data with one another, eliminating the need for intermediaries. Keeping in mind that transparent systems make it easier to detect and address security breaches or unauthorized activities, which eventually enhance the overall security of the blockchain network (Bons, Versendaal, Zavolokina, & Shi, 2020). This not only streamlines operations but also fosters greater trust and efficiency in business interactions, pushing organizations towards enhanced innovation and competitiveness in the digital era.

Not needing an intermediary or third-party organization is known as disintermediation. Disintermediation is a vital characteristic of blockchain technology that makes it differ from other available technologies. Disintermediation allows different organizations to conduct their

operations between each other without the need for intermediaries (Lohmer & Lasch, 2020). By adopting blockchain's different applications, firms of all types and sizes can communicate, collaborate, and exchange data securely with other firms, without the need to employ an intermediary between them (Lohmer & Lasch, 2020). Disintermediation allows organizations to save costs and time incurred by employing intermediaries. In addition, it allows business to contact directly with their customers and maintain their loyalty. Besides that, disintermediation is viewed as a characteristic of blockchain that allows organizations to store, access, share, and audit their data without the need to employ any intermediaries (Malik et al, 2021). In their study, they concluded that disintermediation has a positive effect on blockchain adoption decisions in organizations (Malik et al, 2021).

Another main feature of blockchain technology is immutability. Immutability refers to the inability to alter or manipulate data once it has been recorded on the blockchain. This characteristic ensures that transaction records remain unchanged and permanent, maintaining the integrity of the blockchain system. This feature is achieved through the use of cryptographic hashing and the decentralized nature of blockchain networks. The interconnected blocks in a blockchain network are secured through cryptographic hash functions, making it difficult for unauthorized parties to manipulate the data. The immutability of blockchain ensures data integrity, providing a reliable and tamper-proof record of transactions, contracts, and other digital assets. This immutability feature is fundamental in establishing the reliability and security of blockchain networks, as it prevents unauthorized modifications and ensures the accuracy of stored information. This feature is particularly valuable in industries where data integrity is critical, such as finance, healthcare, supply chain management, and legal services (Rahardja, Hidayanto, Lutfiani, Febiani, & Aini, 2021).

Cryptocurrency is a type of digital or virtual currency that uses cryptography for security and operates independently of a central bank. It utilizes blockchain technology with decentralized control as opposed to centralized digital currency and central banking systems (Kumari, Bala, & Chakraborty, 2023). The consensus mechanism in cryptocurrency is applied to achieve an agreement on the validity of transactions and the addition of new blocks to the blockchain. This is crucial for maintaining the integrity and security of the cryptocurrency network (Lashkari, &

Musilek, 2021). While cryptocurrency remains one of the most well-known applications of blockchain technology, its applications extend far beyond finance. In the business context, blockchain finds diverse applications across various sectors such as insurance, healthcare, music, real estate, customer relationship management, Internet of Things (IoT), supply chain management, and e-government services (Upadhyay, 2020; Bons et al., 2020; Pal, Tiwari, & Haldar, 2021). As businesses continue to explore and integrate blockchain solutions, it is poised to revolutionize operational methodologies and reshape industry landscapes (Upadhyay, 2020; Pal et al., 2021). By leveraging the inherent benefits of blockchain, organizations can enhance transparency, security, and efficiency across various processes, leading to a paradigm shift in the way businesses operate and interact in the digital age.

In addition to that, Blockchain has two types: Public and Private blockchains. Public blockchain grants its users free-permission access to its services. It promotes high level of transparency, decentralization, and collaboration. Public blockchains are mostly used in cryptocurrencies, a popular example is Bitcoin. It enables users to engage in transactions without intermediaries, relying instead on consensus mechanisms to validate and record transactions securely. Private blockchain in contrast, requires users to get permission to use it. Thus, a centralized entity runs it. This type of blockchains is mostly used in private organizations that need a distributed database system that can't be manipulated, saves all the historical transactions, and to keep the data private at the same time. Unlike public blockchains, which prioritize transparency, private blockchains prioritize data privacy and control, making them suitable for various enterprise applications (Almekhlafi, & Al-Shaibany, 2021). By offering these distinct options, blockchain technology provides organizations and individuals with flexible solutions tailored to their specific needs.

Moreover, blockchain has developed in recent years for the purpose of offering better solutions for different needs in the environment. Until now blockchain has had four generations. Generation 1.0 laid the groundwork for digital currencies, particularly cryptocurrencies like Bitcoin. It introduced the concept of a decentralized ledger system, enabling secure and transparent transactions without the need for intermediaries. Blockchain 2.0 expanded the capabilities of blockchain technology by introducing smart contracts and decentralized applications. Platforms

like Ethereum pioneered this generation, allowing developers to create programmable contracts and deploy a wide range of applications on the blockchain. For Blockchain 3.0 the focus shifted towards enhancing scalability, interoperability, and sustainability. It best supports decentralization applications. And finally, Blockchain 4.0 represents the convergence of blockchain technology with emerging technologies. It is best applied for integration with industry 4.0 applications and artificial intelligence (Almekhlafi, & Al-Shaibany, 2021). Overall, the evolution of blockchain technology across these generations highlights its transformative potential and adaptability in addressing a wide range of use cases, from finance and supply chain management to healthcare and beyond.

2.1.2 Blockchain Technology Adoption Factors and Barriers

This section is dedicated for exploring blockchain technology adoption factors and barriers researched and studied in the existent literature. Understanding the technological, organizational, and environmental factors driving adoption decisions is crucial for organizations seeking to employ the transformative potential of blockchain technology. Additionally, identifying and mitigating barriers such as regulatory constraints, technological complexity, and organizational inertia is essential for successful implementation.

In terms of blockchain adoption factors, Ullah, Alnumay, Al-Rahmi, Alzahrani and Al-Samarraie (2020) studied blockchain adoption by employing both Technology Acceptance Model (TAM) and Diffusion of Innovation (DOI) theory, and they built the research model. The research concluded that perceived ease of use, perceived usefulness, attitude toward the technology, and cost are the influencing factors on the adoption decision. The result is not surprising because cost is a frequently studied factor in technology adoption studies and widely recognized as an important factor for adoption decisions. Ngah et al (2021) defined perceived cost as the perceived amount of money to be paid by organization to acquire new technological innovation. Also, Perceived cost include perceived cost to operate the new technology, besides the cost of implementing it in the organization (Setiyani & Rostiani, 2021).

In addition, Lohmer and Lasch (2020) concluded in their study after interviewing experts in management and information systems, that all experts believe that applying blockchain

technology in a serviceable way will result in significant influence on business processes and models. Moreover, in the same study the experts compared blockchain technology spread and adoption rates to the Internet in the begging of 1990s and predicted it to be slow but increasing. According to the study, blockchain technology introduces solutions and potential applications ranging from enhanced collaboration among organizations to the seamless integration of blockchain with the Internet of Things (IoT). Additionally, the study identified the emergence of novel business models and the widespread application of smart contracts as key areas of innovation facilitated by blockchain technology. This research highlights the broad scope and potential transformative impact of blockchain technology across diverse sectors and operational aspects within organizations.

On the contrary, Lohmer and Lasch (2020) found that there are some barriers to adopt blockchain technology as follows: staff difficulties to deal with the technology, legal uncertainties, missing infrastructure and standardization, and unclear governance structures. These barriers underscore the complexity involved in integrating blockchain solutions within organizational contexts. In addition to that, Kouhizadeh, Saberi and Sarkis (2021) in their research they concluded several barriers to blockchain adoption theoretically by interviewing practitioners and academicians and categorizing their views into the categories of TOE model. In their study among Technological, Organizational, and Environmental barriers, technological barriers were found most critical barriers according to practitioners in the industry and academicians. This finding suggests that resolving or mitigating these technological barriers is crucial for facilitating the broader adoption and implementation of blockchain technology in various industries and sectors.

More than that, Yadav, Singh Raut and Govindarajan (2020) conducted a study to explore blockchain technology adoption barriers in India. They concluded two factors that inhibits blockchain adoption in India. First, lack of government regulations to the new technology imposes a significant challenge, creating uncertainty and inhibiting adoption. Second, lack of trust between stakeholders hinders collaboration and delays the widespread acceptance of blockchain solutions. Similarly, in Netherlands another study was conducted to explore barriers to blockchain adoption by interviewing blockchain experts. The study concluded that lack of regulation on blockchain, and lack of knowledge about blockchain properties by non-experts are critical factors that face

blockchain adoption (Vergouwen, Koens & Poll, 2020). These findings highlight the importance of addressing regulatory concerns and fostering trust among stakeholders to facilitate the successful adoption of blockchain technology in the Indian context.

More than that, Xu, Chong, and Chi (2021) identified eleven different barriers to adopt blockchain technology from the literature, industry reports, and experts' feedback. Then, the interdependencies between the factors were examined to gain deeper understandings into their collective impact on blockchain adoption. The results of the studies showed that lack of information technology structure, and lack of legal bases and regulations are the most critical barriers to blockchain adoption in organizations. These barriers pose difficult challenges to organizations seeking to integrate blockchain technology into their operations. Without a solid IT infrastructure, organizations may struggle to effectively implement and leverage blockchain solutions, while the absence of clear legal guidelines and regulations creates uncertainty and inhibits widespread adoption.

On the other hand, some studies were dedicated to exploring adoption factors of blockchain technology. Janssen, Weerakkody, Ismagilova, Sivarajah and Irani (2020) used Koppenjan and Groenwegen's framework to categorize blockchain adoption factors that they summarized from blockchain related literature. Three categories were as follows: institutional, technical, and market factors. Institutional dimensions include factors that request technology design or influenced by blockchain application. These factors are norms and culture, regulations and legislations, and governance. Market dimensions include factors related to the environment that the organization operates in. These factors are mentioned as follows: market structures, contracts and agreements, and business processes. Finally, technical dimension includes factors that are related to the preferred design of blockchain technology. These factors are information exchange and transactions, distributed ledger, and shared infrastructure. This study concluded that all the dimensions are influencing the adoption process and that they mutually influence each other.

Additionally, Koens, Van Aubel and Poll (2021) categorized adoption factors into technical and nontechnical factors based on a technical point of view. According to their research, although some cases in organizations are not suitable for adopting blockchain technology based on technical

point of view, still they adopt the technology for other nontechnical considerations. These nontechnical considerations include philosophical beliefs, network effects, and economic benefits associated with blockchain implementation. In other words, even if the technical aspects may not seem optimal for adopting blockchain technology, organizations might still consider adoption for other philosophical alignment. Their research is critical because it highlights the significance of considering both technical and non-technical factors when evaluating the feasibility and rationale behind adopting blockchain technology within organizations.

Moreover, advantages and properties of blockchain technology were taken as the base for exploring the factors of blockchain adoption. For example, Saurabh and Dey (2021) studied blockchain adoption factors by doing so. In their study dis-intermediation, traceability, trust, coordination, compliance, and cost were the adoption factors under investigation. All these factors were found significantly influencing the adoption of blockchain in supply chain applications. Understanding and addressing these factors are essential for effectively leveraging blockchain technology to optimize supply chain processes and achieve strategic objectives. This also leads to consider the properties of blockchain technology intending to study adoption decisions in organizations.

Nuryyev, Wang, Achyldurdyyeva, Jaw, Yeh, Lin & Wu (2020) utilized TAM model to study organizational adoption of blockchain technology in small and medium sized organizations. They concluded that among the factors that are under investigation, strategic orientation, managers personal characteristics, and social influence, are the factors that have a positive significant influence on blockchain adoption decisions. This research's result also highlights the importance of considering non-technical factors when studying and exploring blockchain technology adoption in organizations. By emphasizing the importance of these non-technical factors, the study provides valuable insights for organizations seeking to navigate the complexities of adopting blockchain technology effectively.

Ullah, Al-Rahmi, Alzarani, Alfarraj, and Alblehai (2021) studied blockchain adoption in smart learning environments. In this study the Technology Acceptance Model (TAM) model and Diffusion of Innovations (DOI) theory were integrated to study the adoption factors. Trialability,

relative advantage, compatibility, ease of use, and perceived usefulness were the factors under investigation. The study concluded that all the factors influenced individuals' decision to adopt blockchain technology. While this research focused on adoption at the individual level rather than the organizational level, it highlighted various application areas for blockchain technology. Moreover, it emphasized the critical role of technical factors in technology adoption. By integrating TAM and DOI theory, the study provided valuable insights into the factors shaping adoption decisions in the context of smart learning environments.

2.1.3 Application Areas of Blockchain Technology

Blockchain technology has rapidly emerged as a revolutionary force reshaping numerous industries worldwide. Its innovative capabilities have enabled the creation of novel solutions to longstanding challenges while offering new opportunities for enhancing efficiency, transparency, and trust. This section is dedicated to exploring diverse applications of blockchain technology across industries. Application areas explored in this section include Financial sector, Supply chain management, Healthcare sector, and Voting systems.

First of all, Blockchain technology has the potential to revolutionize the finance and banking industry by offering secure, transparent, and efficient solutions for payments, transfers, and asset management. Some of the key applications of blockchain in finance and banking include payments. Payments are facilitated by Blockchain by enabling peer-to-peer transactions without the need for intermediaries, reducing transaction costs and processing times. Cryptocurrencies like Bitcoin and stablecoins are increasingly being used for cross-border payments and remittances, offering an alternative to traditional banking systems (Papadis, & Tassiulas, 2020).

Moreover, money transfer also benefits from blockchain. Blockchain-based transfer platforms allow individuals to send money across borders quickly and securely, bypassing traditional banking networks and reducing fees. These platforms offer a more affordable and accessible alternative for migrant workers sending money to their families and friends in their home countries (Naderi, 2021). Furthermore, blockchain has made assets management more practical. Blockchain technology can facilitate the tokenization of assets. It enables partial ownership and trading of real-world assets such as real estate, stocks, and commodities. Blockchain-based asset

management platforms provide investors with greater liquidity, transparency, and security. Which allow them to open up new investment opportunities and democratize access to financial markets (Truong, Le, & Niyato, 2023).

On the other stream, Supply chain management is another industry that stands to benefit significantly from blockchain technology. Particularly in the areas of tracking and tracing goods, ensuring authenticity, and improving transparency and efficiency. Some of the key applications of blockchain in Supply chain management include tracking and tracing goods. Blockchain enables end-to-end visibility into the movement of goods along the supply chain. It allows stakeholders to track and trace the origin, location, and condition of products in real time. This transparency helps prevent counterfeiting, reduce the risk of fraud, and improve supply chain efficiency (Liu, Barenji, Li, Montreuil, & Huang, 2021).

Moreover, blockchain can be used to verify the authenticity and source of products, particularly in industries such as food and pharmaceuticals. In these industries product quality and safety are critical. Recording information about the production, transportation, and storage of goods on the blockchain is vital. Because companies can provide consumers with assurance that products are genuine and meet regulatory standards (Reda, Kanga, Fatima, & Azouazi, 2020). Also, Blockchain-based supply chain management platforms enable secure and transparent sharing of data between stakeholders. That is achieved by streamlining processes such as procurement, inventory management, and logistics. This transparency improves collaboration, reduces errors, and enhances the overall efficiency of supply chain operations (Centobelli, Cerchione, Del Vecchio, Oropallo, & Secundo, 2022).

In addition to Finance and supply chain, Blockchain technology also offered practical innovative solutions for the healthcare sector. In the healthcare industry, blockchain technology has the potential to revolutionize patient data management, pharmaceutical supply chains, and clinical research, leading to improved patient outcomes, data security, and operational efficiency. Firstly, Blockchain technology can provide a secure and tamper-proof platform for storing and sharing patient health records, ensuring privacy, security, and interoperability. By giving patients control over their health data and enabling secure sharing of information between healthcare

providers, blockchain-based health record systems can improve care coordination and decision-making process (Ramesh, Mishra, Atrey, Edla, Misra, & Qi, 2023).

Furthermore, Blockchain can be used to track and trace pharmaceutical products from the point of manufacture to the point of sale. By ensuring the authenticity and integrity of medications and reducing the risk of counterfeit drugs entering the supply chain. It can be achieved by recording information such as batch numbers, expiration dates, and storage conditions on the blockchain. Doing that, pharmaceutical companies can improve traceability, enhance patient safety, and comply with regulatory requirements (Ghadge, Bourlakis, Kamble, & Seuring, 2023). And finally, Blockchain technology can facilitate secure and transparent sharing of clinical trial data. That helps in enabling researchers to collaborate more effectively, verify the integrity of data, and accelerate the development of new treatments and therapies. Blockchain-based platforms for clinical research can improve data integrity, reduce administrative overhead, and enhance patient participation in clinical trials (Omar, Jayaraman, Salah, Yaqoob, & Ellahham, 2021).

The last blockchain application area to explore in this section is Voting Systems. It has the potential to revolutionize voting systems by offering secure, transparent, and tamper-proof solutions for conducting elections and ensuring the integrity of the electoral process. Blockchain-based voting systems enable voters to cast their ballots securely and anonymously from any location with an internet connection. This eliminates the need for physical polling stations and paper ballots. Each vote is recorded on the blockchain, ensuring transparency and auditability of the election process. More than that, Blockchain technology can help prevent voter fraud and tampering by providing a tamper-proof record of all votes cast in an election. The implementation of blockchain in voting systems indicates the start of a new era of democratic participation. It is planned to increase confidence in election outcomes and ensure the integrity and honesty of the democratic process, which eventually results in enhancing the legitimacy and trustworthiness of democratic institutions and governance (Jafar, Aziz, & Shukur, 2021).

2.2 Models And Theories of Technology Adoption

According to the literature related to information technology adoption, theories and models that has been used to investigate information technology adoption can be categorized into two

categories, first category is models used for investigating technology adoption at the individual level, and the second category is models used for investigating technology adoption at the organizational level. In one hand, Technology Acceptance Model (TAM) (Davis, 1985; Davis, 1989; Davis et al., 1989), Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB) (Ajzen, 1985; Ajzen, 1991), and Unified Theory of Acceptance and Use of Technology UTAUT (Venkatesh et al., 2003), are examples of models that goes under the first category. More than that, Diffusion of Innovation Theory (Rogers, 1983), and Technology-Organization-Environment framework TOE (Tornatzky & Fleischer, 1990), belong to the second category.

Technology adoption or shortly adoption is defined as: "*a decision to make full use of an innovation as the best course of action, whereas rejection is a decision not to adopt an available innovation*" (Rogers, 1983, p. 21). Gao and Krogstie (2016) defined adoption as the decision to have and use a new innovation. Moreover, adoption is the decision taken by an organization or individual, to apply and use a technology (Tatnall & Burgess, 2009). Also, Umapathy (2009) defined adoption in the organizational context, as the commitment to invest in implementing and using a technology to support core business functionalities. Additionally, according to Skare and Soriano (2021), technology adoption is defined as the initial integration of new technological innovation into the practices of individuals or organizations. This adoption process encompasses the embrace of innovative products, services, or managerial methodologies within a specific context.

Based on the previous definitions and for the purposes of this research, technology adoption is defined as the decision taken by organizations to invest in acquiring a new technology and applying it in different business functionalities for achieving its goals. In this research the technology under investigation is blockchain technology.

In this part of the chapter, models and theories of technology acceptance and adoption will be explored in greater detail. This part is organized into seven sub sections to discuss seven critical theories in technology adoption domain at the following order: The Theory of Reasoned Action (TRA), The Theory of Planned Behavior (TPB), The Technology Acceptance Model (TAM), The Unified Theory Of Acceptance And Use Of Technology (UTAUT), The Task Technology Fit

Theory (TTF), The Diffusion of Innovation Theory (DOI), and The Technology- Organization-Environment Model (TOE).

2.2.1 The Theory of Reasoned Action (TRA)

The Theory of Reasoned Action (TRA) was developed in the field of psychology by Martin Fishbein and Icek Ajzen in the early 1970s. The theory is important for understanding human behavior. The theory draws its main assumption that human actions are influenced by their reasonable understandings of the information available to them. Basically, the theory presents a framework on the interaction of four components: beliefs, attitudes, intentions, and actions. The theory of reasoned actions suggests that individual's behavior is influenced by their intention to perform it, which is influenced by two other factors; their attitude toward the behavior, and subjective norms associated with it. Individual's positive or negative evaluation of performing a behavior is individual's attitudes. On the other hand, the perceived social pressures or expectations from others regarding individual's behavior are subjective norms (LaCaille, 2020). In other words, if an individual perceives a pressure to perform a certain action, and he/she evaluates the action positively, they are more likely to have intentions to perform the action and eventually performing it.

More than that, the Theory of Reasoned Action (TRA) assumes that attitudes are shaped based on individuals' beliefs about the outcomes of a particular behavior and their evaluations of those outcomes. Subjective norms, on the other hand, are influenced by normative beliefs, which imply perceptions of others' approval or disapproval, as well as the motivation to conform to those perceived norms. Consequently, if an individual perceives that a certain action is widely accepted and approved by others within their environment, they are more inclined to engage in that behavior. This perspective aligns with the findings of Kumar, Gupta, Kumar, Singh, and Singh (2023), indicating that social approval and acceptance significantly impact individuals' likelihood of adopting specific actions or behaviors.

The Theory of Reasoned Action has been applied across diverse fields including psychology, marketing, healthcare, and technology adoption studies, among others. Its adaptable framework facilitates understanding and prediction of human behavior in various contexts,

contributing to advancements in research and practice. For example, in marketing, particularly in the context of consumer behavior, TRA has played a critical role in enhancing our understanding of consumers' decision-making processes (Lau, 2023). By digging into the underlying cognitive factors and social influences driving consumer choices, TRA offers valuable insights for marketers aiming to effectively target and influence consumer behavior. Marketing researchers and practitioners use this theory to evaluate consumers' attitudes towards products or services and to create winning campaigns that influence consumer behavior, and consequently increase profits (Copeland, 2020; Lau, 2023). Similarly, in voting campaigns TRA is used to understand voters' intention to vote by looking at and evaluating their conceptions about voting if it is worthy to vote or not. And also by evaluating the pressure on voters from society and environment towards voting action (Mohanachandran & Govindarajo, 2020).

Although its various applications, TRA was criticized for simplifying human behavior and not taking into consideration other influential factors such as: emotional condition, habits, situational constraints (Yousafzai et al, 2010; LaCaille, 2020). In an effort to respond to criticisms, Fishbein and Ajzen expanded and enhanced the theory of reasoned action to develop the theory of planned behavior TPB (Ajzen, 2020), which will be discussed in the following section. However, the main contribution of the TPB is that it included the concept of perceived behavioral control, which is vital for understanding actions and behaviors that necessitate control over it. Individuals that perceive low control over some actions due to external barriers are less likely to perform it. Ones who have control over barriers are more likely to perform relative action. The inclusion of the concept of perceived behavioral control, to the concepts of TRA, has enhanced theory's predictive power.

In relation the theory of reasoned action TRA, to concept of technology acceptance and adoption field, the TRA contributes to the understanding of individuals' attitudes and behaviors toward adopting and using new technological innovations or resisting it (Saleem et al, 2022, Roh et al, 2023). It is vital here to mention that TRA is used in the context of technology acceptance on the individual level. In this context, when an individual evaluates the technology positively or negatively, this evaluation is influenced by the individual's beliefs about the technology's perceived benefits, ease of use and applicability. Similarly, subjective norms in this context are represented

in the perceived social pressure on an individual to accept or resist relevant technology based on the perceived approval or disapproval from the society of relevant technology.

More than that, The Theory of Reasoned Action (TRA) plays a foundational role in technology adoption studies by providing a framework to understand and predict individuals' behavioral intentions regarding the adoption of new technologies. TRA helps researchers analyze and understand how individuals perceive the benefits and drawbacks of adopting a particular technology and how their decisions are influenced by societal expectations and psychological factors (Roh, Park, & Xiao, 2023). Moreover, TRA serves as a precursor to more advanced models like the Technology Acceptance Model (TAM). The relationship between TRA and the technology adoption field has been broadly researched and studied, which eventually has led to the development of new models and theories (Çelik, & Aypar, 2023). For example, the Technology Acceptance Model (TAM) is an extension of TRA, which was proposed by Fred Davis and Richard Bagozzi to specifically address the acceptance of information technology innovations. TAM will be discussed more in subsequent sections.

Finally, TRA has evolved into more complex models, but still its core principles remain central in guiding research, interventions, and strategies for influencing and understanding human decision-making processes. The importance of TRA is shown in its ability to highlight the relationship of cognitive factors and social influences, plus in offering valuable insights into human behavior for researchers and practitioners (Çelik, & Aypar, 2023; Kumar, Gupta, Kumar, Singh, & Singh, 2023). By emphasizing the importance of attitudes, beliefs, and subjective norms, TRA provides a comprehensive framework for understanding the complexities of decision-making processes, not only in the context of technology adoption, but also in other behavioral domains. Its continuing relevance highlights its utility as a foundational theory in psychology and related disciplines, facilitating advancements in both theoretical understanding and practical application.

2.2.2 The Theory of Planned Behavior (TPB)

As previously mentioned, the Theory of Planned Behavior (TPB) was developed to bridge the gap in the theory of reasoned action (TRA). Responding to criticisms of TRA, Icek Ajzen in the late 1980s developed the theory of planned behavior. The addition of Perceived Behavioral

Control concept to TRA concepts enhanced our understanding of human behavior. This concept encompasses one's control over his/her actions, meaning that individuals who perceive that they are able to perform a certain action would result in higher chances of doing it (LaCaille, 2020).

Human perceived ability to perform actions is influenced by a set of internal and external factors, which can either facilitate or hinder them from performing intended actions. In addition, in the Theory of Planned Behavior (TPB), the concept of attitude mirrors that of the Theory of Reasoned Action (TRA). Attitudes represent an individual's positive or negative evaluation of engaging in a specific action. Furthermore, subjective norms in TPB involve perceived social pressures or expectations from individuals within one's social network regarding their behavior. These elements collectively shape individuals' behavioral intentions and ultimately impact their actual behavior, highlighting the sophisticated relationship between cognitive, social, and environmental factors in determining human actions (LaCaille, 2020).

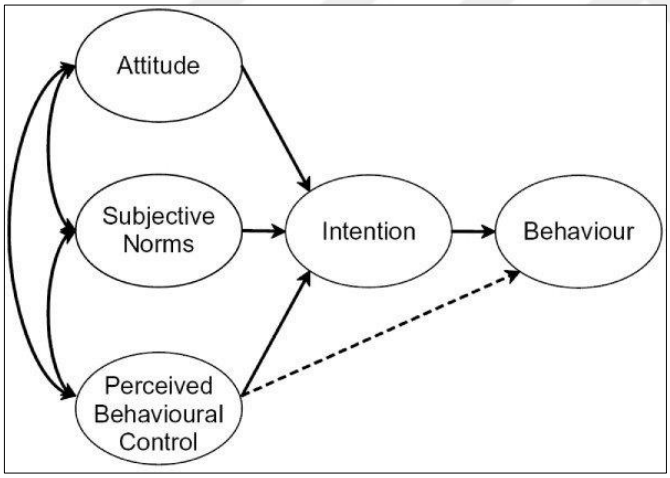

Figure 1 Theory of Planned Behavior (Ajzen, 1991).

As shown in figure1, theory of planned behavior assumes that behavioral intention is formulated and affected positively or negatively by the three predictors: individual's attitude, subjective norms, and perceived behavioral control. In cases where individuals have positive behavioral intentions, they are more likely to perform intended actions and vice versa. Also, perceived behavioral control has a direct effect on one's behavior. For example, the tendency of university students to engage in daily meditation may primarily stem from their positive attitudes

towards its perceived benefits and importance. While the opinions of others regarding their meditation practices may have some impact, it might not be as a significant influence on their intentions compared to their personal attitudes towards meditation. This highlights the major role of individual beliefs and perceptions in shaping behavioral intentions. This suggests that internal motivations and attitudes often play a more influential role than external social pressures in determining one's actions (Erbe, Meindl, Dykhuis, Boatright, & Tilman, 2023).

On one hand, The theory of planned behavior TPB has various applications in different fields such as: sociology, health, psychology, marketing, technology acceptance, and environmental studies (Alam, & Fathima, 2023; Alano, de Oliveira, Joucoski, Pereira, Martins, de Souza Martins, & Trizoti, 2023; Beressa, Whiting, & Belachew, 2024). An example of the theory application in environmental studies is represented by research conducted in Saudi Arabia to understand factors that influences consumers to recycle solid waste and to perform environmentally friendly actions (Soomro, Hameed, Bhutto, Waris, Baeshen, & Al Batati, 2022). In their study they applied the theory of planned behavior to the study problem. The study measured different social subjective norms, individuals' attitudes, and perceived behavioral control, and individuals' awareness of consequences (Soomro et al, 2022). TPB noticeably helped in understanding human behavior and the motives behind their actions in different contexts.

On the other hand, the theory of planned behavior was criticized for not considering more factors related to human behavior such as emotions, past behavior, and cultural context. Also, it was criticized for simplifying human behavior. In an effort to respond to these criticisms and to have more explanatory power to research models, researchers started to apply extended versions of TPB model by adding factors to the original theory model. Cultural context was found to be an effecting factor on individual behaviors in marketing studies, for example (Adel, Dai, & Roshdy, 2022). Cultural context has noticeable impact on the formation of attitudes, subjective norms, and perceived behavioral control (Adel et al, 2022). Also, emotions were found to have a significant effect on behavioral intentions in the context of environmental studies (La Barbera, Amato, Riverso, & Verneau, 2022).

Viewing technology acceptance as one form of human behavior has led to shedding light on the interrelation between theory of planned behavior and new innovations and technology adoption. Similar to the theory of reasoned action, the theory of planned behavior provided a framework to study and understand factors that influence technology usage patterns, acceptance, and adoption intentions. In a study of cloud computing technology acceptance, TPB factors were employed and applied (Taufiq-Hail, Ibrahim, & Yusof, 2017). Individual attitudes toward cloud computing means whether individuals view this technology to be advantageous and user-friendly or not. Subjective norms in this context are represented by the support of the usage of cloud computing from individuals' peers or social environment. Also, perceived behavioral control in cloud computing acceptance is represented by individuals' technical expertise, the more experienced they are, the more perceived behavioral control they have (Taufiq-Hail et al, 2017).

More than that, while the theory of planned behavior is valuable for understanding and forecasting individual behavior, its applicability across different contexts poses a set of challenges. An example of that is the adoption of information systems, the theory lacks a robust system of measurements to explain system acceptance or rejection (Saeidi, Enjedani, Behineh, Tehranian, & Jazayerifar, 2023). To address this, a comprehensive technology acceptance model was recommended. This model integrates reasoned action theory and planned behavior theories, offering a reliable framework for predicting the actual usage of specific technologies across various settings and contexts. By integrating these theories, researchers can better account on such a framework for technology adoption studies. These studies are usually accompanied with complexities due to the nature of technology adoption and utilization contexts (Ateşgöz, 2023).

Eventually, both TRA and TPB evolved and developed to other models and theories dedicated to study technology acceptance such as: Technology Acceptance Model (TAM) and Unified Theory Of Acceptance And Use of Technology (UTAUT) models. These models will be discussed in sections following this section. Finally, this development and integration of psychological concepts into the field of technology has led to a deeper understanding of technology diffusion, the essential elements of technology design, and effective technology implementation strategies. Consequently, this enhanced understanding has contributed to increased rates of technology adoption at the individual level. By integrating insights from psychology into

technology-related research and practice, professionals can better design technological solutions to meet users' needs and preferences. Thereby facilitating smoother adoption processes and encouraging greater acceptance and utilization of technology among individuals.

2.2.3 The Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) is developed by Fred D. Davis in 1989. It is viewed as the extension of the Theory of Reasoned Action (TRA) developed by Ajzen and Fishbein (1980). Due to the generic nature of TRA and the lack of technology-specific factors in TRA theory, the TAM was developed. Davis argued that in the context of technology acceptance, TRA doesn't serve well enough to understand the phenomena. He justified his argument by shedding the light on the fact that behavioral intention in the case of technology acceptance is not shaped by a general attitude toward the technology, rather it is shaped due to specific attitudes and beliefs related to the use of technology itself (Davis, 1989). Based on that, TAM aims at understanding individual's acceptance of new technology innovations, in order to plan for a successful technology implementation.

The model is considered as a critical tool to help practitioners to be aware of which measures to take into account before implementing new information systems and technologies. The main assumption of this model is that the intention to use technology is related to two factors: perceived usefulness, and perceived ease of use (An, Eck & Yim, 2023). These two factors critically influence individuals' behavioral intentions toward technology. And in turn behavioral intentions eventually leads them to the actual use of technology, as shown in the following figure:

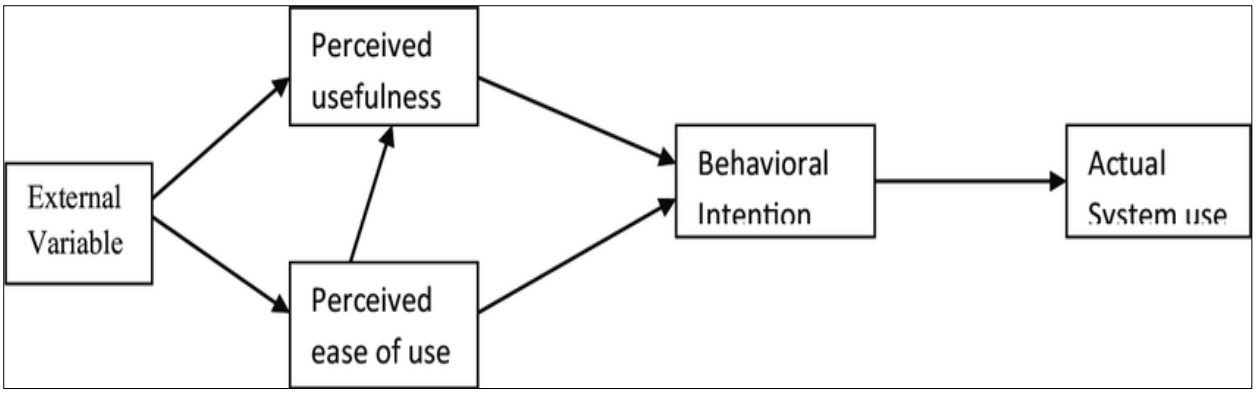

Figure 2 Technology Acceptance Model 1, By Davis (1989)

Perceived Usefulness explains to which extent an individual perceives that the new technology or information system is advantageous to him/her, and that this technology is going to enhance or boost their performance at work (Davis, 1989). In other words, if the new technology will help them to save time and effort for performing a certain task, then they'll perceive the technology to be useful, which consequently will motivate them to adopt this technology. Moreover, Perceived Ease of Use was defined as the extent to which an individual perceives the use of a specific system as effortless or without any significant hardness (Davis, 1989; An, Eck & Yim, 2023). Perceived ease of use explains to which extent simple it is to use the technology. Which means the easier and simpler it is to use the technology, the higher the technology adoption chances are.

Across different fields of study, TAM was extensively used to understand users' behavioral intentions toward different technologies. For instance, in the field of organizational research, the model has been influential in understanding employees' adoption and usage of new technologies to perform their job tasks (Nasongkhla & Shieh, 2023). That was achieved by measuring perceived usefulness and ease of use. Understanding employees' behavioral intentions helped organizations to plan and design training programs for employees to ensure a better technology implementation and adoption among employees (Fahmi, Mukti, Alamsah & Putra, 2024).

In addition to that, TAM was applied in the field of education to help understand acceptance and usage patterns of new e-learning platforms, and educational software applications among students and teachers (Ahmad, Mohd Noor, Alwan, Gulzar, Khan & Reegu, 2023). Also, the

technology acceptance model facilitates the assessment of different learning and teaching technologies. This will help developers and educators to present a more satisfactory learning experience supported by e-learning platforms (Khodadad Hoseiny, Noori & Zabihi, 2023). Moreover, TAM is used in healthcare field, marketing, public administration, geography, and many other fields. Each field of study benefited from the explanations provided by TAM model in exploring behavioral intentions toward any technology to be introduced to that certain field (Zin, Kim, Kim & Feyissa, 2023; An, Eck, & Yim, 2023).

On the contradictory, TAM was also criticized despite its extensive application. Researchers argued that since TAM was originally developed to for technology acceptance at the workplace, it consequently overlooked other voluntary technology adoption situations, such as technology adoption among consumers. Also, TAM neglected the role of subjective norms on technology adoption intention, although TAM was developed on the basis of the theory of reasoned action (Venkatesh & Davis, 2000; Malatji, Eck & Zuva, 2020). In response to these concerns, scholars extended the technology acceptance model TAM to technology acceptance model 2 TAM2. In the technology acceptance model 2 TAM2, subjective norms were added to the model, in addition to other external variables. TAM2 will be discussed in more detail here.

After addressing the limitations of TAM1, Venkatesh & Davis (2000) have proposed an extension for the model in an effort to enhance it, by including moderating variable, and external variables that extend individual perceptions. As shown in the following figure, external variables included Subjective Norms, Image, Job Relevance, Output Quality, and Result Demonstrability. Moderators included Experience, and Voluntariness. Subjective norms is defined by Venkatesh and Davis (2000) as an individual's perception that people in his community who are important to him think he should or should not do the action in question. Subjective norms effects Intention to Use in three ways: directly, and indirectly through perceived usefulness or through image. Image has an indirect effect on Intention to Use in the context of TAM2 through perceived usefulness. Image is defined as the degree to which use of a technological innovation is perceived to heighten person's status in his social environment (Venkatesh & Davis, 2000).

Similarly, Job Relevance, Output Quality, and Result Demonstrability have an indirect effect on Intention to Use in the context of TAM2 through perceived usefulness. Job Relevance represents an individuals' perspective on how suitable and applicable the technology is for their specific job role (Dhiman, Kumar & Nagpal, 2023). Moreover, Output Quality conveys how individuals perceive the technology's effectiveness in accomplishing tasks, it represents the aimed quality of these tasks using technology in consideration (Zhu & Zhang, 2022). Finally, Result Demonstrability is visibility of the outcomes resulted from using the technology (Zhu & Zhang, 2022).

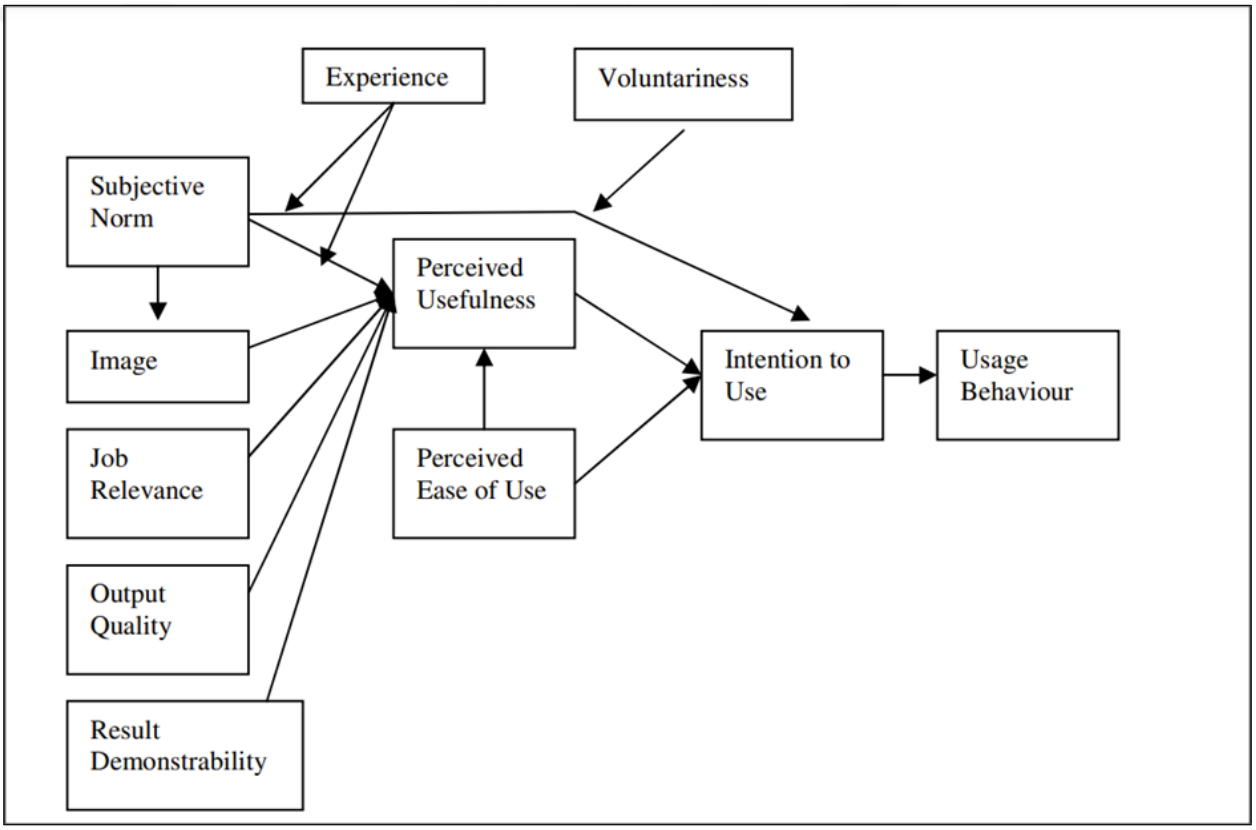

Figure 3 TAM2 by Venkatesh and Davis (2000)

Although TAM2 has introduced several advancements to overcome the limitations of TAM1, it was criticized for the difficulty in quantifying the model's concepts, and for the overall complexity of the model (Malatji, Eck & Zuva, 2020). TAM3 was introduced as an enhancement of TAM2 in order to present a more comprehensive understanding of behavioral intentions of technology acceptance (Venkatesh & Bala, 2008). Venkatesh and Bala (2008) proposed TAM3 by

adding antecedents of Perceived Ease of Use. These antecedents are computer Self-Efficacy, Perception of External Control, Computer Anxiety, Computer Playfulness, Perceived Enjoyment, and Objective Usability.

In this context, Self-Efficacy is defined as the extent to which an individual perceives their capability to execute a particular task or job utilizing the computer (Rosli & Saleh, 2023). The extent to which an individual holds the belief that there are sufficient organizational and technical resources available to support the use and implementation of the technological system, is known as Perception of External Control (Venkatesh et al, 2003). Also, Computer Anxiety is referred to the extent of an individual's anxiety, hesitation, or fear when faced with the prospect of using computers (Rosli & Saleh, 2023). Moreover, Computer Playfulness is defined as an individual's internal drive or motivation linked with the adoption and utilization of a new system (Venkatesh & Bala, 2008). Perceived Enjoyment is The degree to which individuals perceive the act of using a particular technology as essentially enjoyable or pleasurable, regardless of any performance outcomes derived from using that technology (Setiyani, Effendy & Slamet, 2021). And finally, Objective Usability implies comparing systems based on the real level of effort needed to accomplish specific tasks, rather than relying on subjective perceptions (Venkatesh, 2000).

After reviewing TAM1, TAM2, and TAM3 models and exploring their strengths and limitations, it is worthy to review some of the recent empirical studies in their context. Alsyouf, Lutfi, Alsubahi, Alhazmi, Al-Mugheed, Anshasi, Alharbi, and Albugami (2023) in their research applied the technology acceptance model to predict users' acceptance and usage of personal health record systems PHRs in Saudi Arabia. They extended the original TAM model to understand the phenomena more precisely, and to measure all possible influencing factors on the adoption decisions. Their study was conducted to predict acceptance of the system on the individual level. In the research model, privacy, security, and useability were used as factors to extend the original TAM model. According to their study, the results showed that security, privacy and useability critically and noticeably increase users' intention to adopt and use the system. The researchers concluded that TAM provides a structured approach to understand users' perceptions of PHRs, by focusing on key factors such as perceived usefulness, ease of use, and the added factors. Also, By

leveraging TAM, stakeholders can design and implement PHR systems that align with users' needs and preferences, ultimately enhancing acceptance and usage among patients.

More than that, Altawalbeh (2023) studied learning management systems in Jordanian universities on the individual level. The study was based on the extended technology acceptance model 2 to understand faculty staff's perceptions toward the system and their adoption intentions. The extended version TAM2 of TAM was employed in this research in order to include these following factors: subjective norm, voluntariness, experience, image, job relevance, output quality, and result demonstrability. These additional variables contribute to a deeper understanding of the complicated dynamics surrounding technology adoption within the academic faculty staff of educational institutions. They offer valuable insights into the complex nature of this process (Altawalbeh, 2023). Furthermore, this study in its context provided a practical justification for the benefits of TAM2. TAM2 offers valuable insights into the methodological attributes impacting attitudes and behaviors towards system usage, making it a valuable model for forecasting technology adoption within educational settings.

Finally, Kronberg (2024) deployed the third extended technology acceptance model TAM3 to study ChatGPT adoption and use among students in Sweden. Specifically, the researcher was interested in understanding the effect of gender on adoption patterns. The additional factors in TAM3 such as Computer Anxiety, and Computer Playfulness, allowed for a more comprehensive understanding of the phenomena. In other words, it allows for thorough analysis of users' attitudes and perceptions toward using ChatGPT, as well as their intentions and behaviors related to its use. Besides that, the researcher concluded that there was no significant difference between males and female students in their intention to use ChatGPT. But the study revealed that males had lower anxiety level toward using AI applications and ChatGPT, when compared to female students (Kronberg, 2024). TAM3 was beneficial in this study as it is the version of TAM that includes anxiety as an influential factor.

2.2.4 The Unified Theory Of Acceptance And Use Of Technology (UTAUT)

Moving forward, after discussing TPB, TRA, and TAM it is important to explore another technology adoption theory that is widely employed in the research. The Unified Theory of

Acceptance and Use of Technology (UTAUT) was developed by Venkatesh, Morris, Davis, and Davis (2003). The theory was developed in an effort to develop a unified model that combines the fundamental principles of prior theories on the acceptance of technology and innovation. Eight theories were analyzed by Venkatesh et al (2003) to base on the new UTAUT model. Particularly, TPB, TRA, TAM and its extensions. Moreover, UTAUT aims to offer a comprehensive understanding of all factors that impact behavioral intention regarding the adoption of a new technology. That was achieved by presenting a unified method for understanding the complexities involved in user acceptance and usage of technology (Venkatesh et al, 2003).

The UTAUT model incorporates four main concepts that play crucial roles in shaping individuals' intentions and behaviors towards technology adoption. These concepts are Performance Expectancy, Social Influence, Effort Expectancy, and Facilitating Conditions. Firstly, Performance Expectancy, or expectation of performance, implies the degree to which individuals believe that using a particular technology will enhance their performance or productivity. It focuses on users' perceptions of the benefits and usefulness of technology in facilitating task accomplishment (Dash, Sharma, & Swayamsiddha, 2023). For example, a student might perceive that using a new e-learning system will enable him\ her to track and complete assignments more efficiently. Which will lead to increased productivity and better learning outcomes (Ali & Warraich, 2023). This concept is closely related to Perceived Usefulness, and Relative Advantage constructs in TAM and DOI models respectively. All these concepts relate to the same idea of their relation and influence on behavioral intentions (Venkatesh et al, 2003; Dash, Sharma, & Swayamsiddha, 2023).

Secondly, Social Influence implies the impact of social factors, such as norms, opinions, and peer pressure, on individuals' decisions to adopt or reject a technology. It highlights the significance of social interactions and subjective norms in shaping users' attitudes and intentions towards technology usage (Venkatesh et al, 2003; Dash et al, 2023). For example, if a student's classmates highly recommend a new e-learning tool, they may be more likely to adopt it based on the perception of social approval and support (Ali & Warraich, 2023; Hunde, Demsash, & Walle, 2023). The key in this context is to take into consideration that an individual is only influenced by people who are important to him\ her. This concept corresponds to the Subjective Norms of TRA

and TPB theories (Venkatesh et al, 2003). However, In situations where individuals are obligated to adopt technology, they may employ technology out of necessity to meet compliance obligations, rather than out of personal choice or preference. This situation is similar to Coercive pressures exerted on organizations within institutional environments (DiMaggio & Powell, 1983; Soares, Mendes-Fillo, & Gretzel, 2020), as will be explained later in the institutional theory section of this literature review.

Thirdly, Effort Expectancy, or expectation of effort, implies the perceived ease of use related to adopting and utilizing a specific technology. It reflects users' beliefs regarding the level of effort required to learn and operate the technology effectively. Which eventually results in influencing their willingness to engage with it or not (Venkatesh et al, 2003; Dash et al, 2023). For instance, students may be more inclined to adopt an e-learning system with a friendly user interface. Because usually these interfaces are perceived to be easier to navigate and use compared to a complex interface (Hunde, Demsash, & Walle, 2023). This concept corresponds to the Ease on Use concept from TAM model. As previously discussed, both concepts look for the extent to which a system is easy and free of effort (Davis, 1989). They emphasize the importance of simplicity and accessibility in encouraging users to adopt and utilize technology effectively. Eventually, measuring effort expectancy helps researchers and practitioners understand how the easefulness of the technology would influence individuals' acceptance and adoption decisions (Dash et al, 2023).

Lastly, Facilitating Conditions refers to the extent to which users perceive the availability of resources, support, and infrastructure necessary for adopting and using the technology. In other words, this means it is important for individuals to see that their organization is supporting the use of the new system by offering the needed technical and organizational support. Also, this concept emphasizes the importance of environmental factors and support systems in facilitating technology acceptance and implementation (Venkatesh et al, 2003; Dash et al, 2023). For example, a student might be more likely to adopt a new e-learning system platform if their school offers training and technical support to ensure a smooth transition to the new system (Hunde, Demsash, & Walle, 2023). This concept corresponds to Perceived Behavioral Control, that was previously explained by the Theory of Planned Behavior. Perceived Behavioral Control discussed that one part of

individuals' perceived control is the offered support and resources to them for using the system (Ajzen, 2020).

These four concepts are the main ones in the UTAUT model. All these four concepts are direct determinants of behavioral intention. Where facilitating conditions is also directly affecting the use behavior. The model also encompasses four moderating factors: age, gender, experience, and voluntariness of use (Venkatesh et al, 2003). These moderating factors influence the strength and direction of the relationships between the core concepts and technology adoption behavior. It is worth mentioning that the first three moderating factors moderate the relationship between the four concepts and behavioral intentions. But voluntariness of use only moderates the relationship between social influence and behavioral intentions (Venkatesh et al, 2003; Dash et al, 2023).

The UTAUT model was originally developed to study technology acceptance and adoption within organizational settings. It was employed in many contexts in literature. For example, it was used to measure e-leaning adoption in universities (Hunde, Demsash, & Walle, 2023), healthcare technology systems studies (Edo, Ang, Etu, Tenebe, Edo, & Diekola, 2023), and banking technologies studies (Bouteraa, Raja Hisham, & Zainol, 2023). Despite these adaptations of UTAUT model to different contexts, it was criticized for its limited use within organizational settings, rather than other consumer technology acceptance studies -to study technologies not within organization-. In response to its limitations, the UTAUT 2 model was developed by Venkatesh, Thong, and Xu (2012).

The extended UTAUT 2 model included additional three concepts: Price Value, Hedonic Motivation, and Habit (Venkatesh et al, 2012). Price value is the concept that shows the main difference between organizational and consumer study since the consumer is going to directly bear the price value of the technology. Price Valve implies users' perceptions of the economic value or cost-effectiveness of adopting a technology. Including price value in UTAUT 2 highlights the importance of economic factors in shaping technology adoption behavior. It is concluded that the higher the price value of the technological innovation, the less tendency toward technology adoption by individuals (Venkatesh et al, 2012; Lee, Lim, & Eng, 2023). Bearing that in mind,

UTAUT 2 provides insights into the economic drivers of technology adoption. Also, offers guidance for pricing strategies and encouragement programs to promote new technologies.

More than that, Hedonic Motivation implies the pleasure or enjoyment that individuals gain from using a technology. Unlike practical motivations, which focus on the practical benefits of a technology, hedonic motivations are driven by the desire for entertainment, enjoyment, or social interaction (Venkatesh et al, 2012). In other words, this concept conveys and answers how much is fun to use a technology under investigation. Hedonic features in technology include gaming apps, social media platforms, and multimedia content. Hedonic Motivation highlights that technology adoption is not only driven by utilitarian aspects like perceived usefulness and ease of use. Rather, individuals might be motivated to use technology because it brings them pleasure or improves their overall well-being (Venkatesh et al, 2012; Lee, Lim, & Eng, 2023). By taking into account hedonic motivations, UTAUT 2 provides a more comprehensive view of technology adoption behavior and enables the examination of approaches to address users' hedonic desires.

And finally, the third added concept to UTAUT 2 is Habit. Habit reflects the extent to which individuals use technology automatically and routinely in their daily life. This behavior is described as repetitive, unconscious, and usual. In the context of technology adoption, habit reflects users' established patterns of behavior and the tendency to continue using a technology out of habit rather than active intention (Venkatesh et al, 2012). Previous research concluded that habits significantly influence technology adoption behavior, even in the absence of strong intentions to adopt the technology. Bearing this in mind, UTAUT 2 provided insights into the persistence of technology use over time and offers guidance for promoting habit formation and fostering long-term engagement with technology (Venkatesh et al, 2012; Lee, Lim, & Eng, 2023).

Both UTAUT 1 and 2 were largely criticized for their complexity, which is derived from the inclusion of numerous concepts. This complexity can pose challenges in terms of model interpretation, application, and practical implementation. While moderators are introduced to enhance the models' explanatory power, their inclusion worsens the complexity further. Consequently, in many cases, researchers choose to utilize these models without moderators to mitigate the difficulties involved, favoring a more streamlined approach for practical

implementation and ease of understanding (Dwivedi, Rana, Jeyaraj, Clement, & Williams, 2019; Blut, Chong, Tsiga, & Venkatesh, 2021).

To sum up this section, UTAUT as a comprehensive framework, it enables researchers, businesses, and policymakers to gain deeper insights into the factors that drive technology adoption and usage behavior. The UTAUT model offers a holistic understanding of user behavior. Also, UTAUT aids in the development of more effective technology adoption strategies. Additionally, it facilitates the identification of barriers and facilitators to technology adoption. Ultimately, UTAUT's ability to provide robust explanations of technology acceptance and usage behavior makes it an vital tool in supporting the technology development process, guiding decision-making, and driving innovation in various industries and domains (Khechine, Lakhal, & Ndjambou, 2016; Dwivedi et al, 2019; Blut et al, 2021).

2.2.5 The Task Technology Fit Theory (TTF)

On the other stream of research, the Task Technology Fit TTF theory was introduced in order to study a different aspect of technology adoption. Previously discussed theories of TPB, TRA, TAM, and UTAUT, were centered on studying and exploring factors in the adopters' environment that influence adoption of technology decisions. Neglecting the role of technological characteristics and their relation to tasks requirements. The TTF theoretical framework explores that relationship. The theory was introduced by Goodhue and Thompson (1995). Moreover, the theory argues that in cases where functionalities of a given technology correspond to the tasks' specific requirements, the technology will be utilized and adopted. In other words, Task-Technology Fit Theory (TTF) serves as a guiding framework for assessing the compatibility between technology and the tasks it is intended to support within an organizational context (Goodhue, & Thompson, 1995; Muchenje, & Seppänen, 2023).

More than that, at its core, TTF emphasizes the importance of understanding both the characteristics of the tasks to be performed and the attributes of the technology being employed. By assessing the fit between these two sets of characteristics, organizations can optimize technology use to better support their operational needs and strategic objectives. Looking deeper into the details of this theory, it's crucial to examine its key components, the concept of fit, and

practical applications across various organizational contexts (Goodhue, & Thompson, 1995; Muchenje, & Seppänen, 2023). First of all, the theory has five main components: technology characteristics, task characteristics, performance, utilization, and fit. Technology characteristics implies the features, functionalities, and capabilities of the technology being used within the organization. These characteristics can include usability, flexibility, and compatibility with existing systems. For example, a technology solution with a user-friendly interface, and seamless integration capabilities, may be better fitted to support a wide range of organizational tasks compared to one with limited features and compatibility issues (Spies, Grobbelaar, & Botha, 2020).

On the same stream, the second component of TTF theory is task characteristics. This component implies the nature and requirements of the tasks that individuals or groups within an organization need to perform. Tasks can vary in terms of complexity, interdependence, and frequency, among other factors (Goodhue, & Thompson, 1995; Muchenje, & Seppänen, 2023). For example, tasks that involve high levels of complexity or interdependence may require technological solutions that offer robust collaboration features and advanced analytical capabilities (Spies, Grobbelaar, & Botha, 2020). In other words, individuals look at how well the technology fits the tasks need to be done, by breaking it down depending on how complex the tasks are. This means that they check how different parts of the technology match up with what they're trying to achieve. By doing this, individuals gain understanding of how well technology helps them to complete the intended tasks, and then changes or improvements can be done if needed.

In addition to that, the third component of the Task Technology Fit theory is Performance. Enhancing performance in the context of organizations is TTF theory’s ultimate goal. The goal is achieved by ensuring that the technology used is well-matched to the tasks at hand, and therefore organizations can improve efficiency, productivity, and overall effectiveness. More particularly, when the technology is well aligned with task requirements, it enables individuals or teams to perform their tasks more effectively, efficiently, and accurately. Higher rates of performance can’t be achieved without ensuring the fit between technology and tasks (Spies, Grobbelaar, & Botha, 2020; Muchenje, & Seppänen, 2023).

The fourth component of the TTF theory is Utilization. Utilization is the extent to which individuals or groups within an organization effectively utilize technology to support and enhance their tasks. In this context, utilization corresponds to adoption in TAM, and UTAUT models. Utilization is a critical component of TTF as it reflects the actual adoption and usage of technology in real-world settings, beyond simple perceptions of fit (Goodhue, & Thompson, 1995; Muchenje, & Seppänen, 2023). Also, Utilization serves as a tangible indicator of the alignment between technology and tasks. Hence, when individuals effectively utilize technology to perform their tasks, it provides validation that the technology is well-suited to support those tasks, reinforcing positive perceptions of fit. Eventually, when task and technology characteristics are aligned, the technology will be utilized, and in turn influence task performance and efficiency (Spies, Grobbelaar, & Botha, 2020; Muchenje, & Seppänen, 2023).

The fifth and last component of the Task Technology Fit theory is Fit. Fit refers to the degree of alignment between the characteristics of the technology and the requirements of the tasks it is intended to support (Goodhue, & Thompson, 1995). A high degree of fit indicates that the technology effectively meets the needs and requirements of the tasks, thereby enhancing task performance and efficiency. Conversely, a low degree of fit suggests that there may be mismatches or deficiencies that could hinder performance and impede organizational effectiveness (Al-Rahmi, Shamsuddin, & Alismaiel, 2020). Moreover, a strong fit between technology and tasks fosters user satisfaction, acceptance, and engagement, leading to positive outcomes for both individuals and organizations (Spies, Grobbelaar, & Botha, 2020; Muchenje, & Seppänen, 2023).

The Task Technology Fit theory was originally developed to study technology utilization and fit within organizational settings. It was employed in many contexts in literature. For example, it was used to measure e-leaning adoption in universities (Alyoussef, 2021), healthcare technology systems studies (Chen, Chen, & Tsai, 2022), and banking technologies studies (Rahi, & Abd Ghani, 2021). Despite these adaptations of TTF theory to different contexts of research, it was criticized for its overemphasis on fit, which often result in overlooking other factors that contribute to technology adoption and success, such as user motivation, training, support, and organizational readiness. This narrow focus on fitness may lead to oversimplified explanations of technology-related phenomena (Spies, Grobbelaar, & Botha, 2020; Muchenje, & Seppänen, 2023).

In addition to that, the Task Technology Fit was further extended by combining it with other technology adoption models. First of all, the integrated Task-Technology Fit and Technology Acceptance Model (TTF-TAM) represents a comprehensive approach to understanding technology adoption and utilization within organizational contexts. By combining elements of both frameworks, the integrated TTF-TAM framework provides a holistic perspective that considers both individual-level perceptions and organizational-level factors that influence technology acceptance and fit. Also, it helps in developing strategies to optimize its impact on task performance and organizational effectiveness. (Vanduhe, Nat, & Hasan, 2020).

More than that, the TTF was integrated with UTAUT model. The integrated TTF-UTAUT framework can inform technology adoption strategies by identifying factors that influence users' intentions and behaviors related to technology acceptance. Organizations can develop targeted interventions to address barriers to acceptance and promote positive perceptions of technology among users. Also, organizations can identify areas where technology may be misaligned with organizational needs and objectives. This information can guide decisions related to technology selection, customization, and implementation to better support task performance (Aljarboa, & Miah, 2022).

2.2.6 The Diffusion of Innovation Theory (DOI)

The diffusion of innovations is a crucial phenomenon that influences how novel concepts, methodologies, and technologies are adopted and disseminated within both societal and organizational contexts. The theory of Diffusion of Innovation, developed by Rogers in 1983, explains the spread of innovative ideas, products, applications, or technologies across various sectors (García-Avilés, 2020). It highlights the significance of understanding how these innovations are communicated and accepted over time within social and organizational networks. Which in turn shapes the dynamics of change and progress in modern societies and workplaces (Rogers, 1983; Guidolin, & Manfredi, 2023).

The theory of Diffusion of Innovation is rooted in a multi-perspective theoretical framework. It draws from disciplines such as sociology, communication theory, psychology, and economics. This theory originally proposed to study technology adoption on the organizational

level. It conceptualizes the diffusion process as the gradual transmission of an innovation through specific channels within a social society over time (Rogers, 2010; García-Avilés, 2020). The central premise of DOI theory lies in its ability to explain the factors influencing the adoption of new technologies or innovations. These factors involve three key dimensions: attributes of the adopters, the characteristics of the innovation, and the decision-making process involved in adoption (Guidolin, & Manfredi, 2023). In the following discussion, each of these dimensions will be explored in greater detail to provide a comprehensive understanding of the diffusion of innovations and its implications for technology adoption within organizations.

The Diffusion of Innovation (DOI) theory reshaped the study of technology adoption by emphasizing the importance of understanding adopters' characteristics. Rogers (1983) highlights that different categories of adopters have unique qualities, which facilitates their identification. And that in turn will help in targeting them during the adoption and implementation of new technologies in organizations. Rogers (2010) further expands on this concept by describing five distinct types of technology adopters. By recognizing the different profiles and preferences of adopters, organizations can design their strategies to effectively engage with each group. And thereby improve the successful integration and utilization of new technologies within their operations (García-Avilés, 2020; Guidolin, & Manfredi, 2023). Understanding adopters' characteristics is vital for addressing the complexities of technology adoption processes and ensuring widespread acceptance and implementation across various departments of the organization.

The first type of adopters is Innovators. They comprise 2.5% of the adopters of technology. Despite their small number, innovators play a fundamental role in initiating the diffusion of new technologies. Their tendency for risk-taking, coupled with sufficient financial resources, enables them to thoroughly test and experiment with emerging technologies. Following innovators, early adopters, representing 13.5% of adopters, show a more risk-averting approach. They usually prefer to wait for initial reviews and feedback before they are taking in their adoption decisions. Subsequently, the early majority. They comprise 34% of the adopters of technology. They adopt technology after thorough research and analysis. They carefully evaluate the advantages of the new technology before making a commitment (Rogers, 2010; Guttentag, & Smith, 2022).

Additionally, the late majority constitutes the fourth group of adopters. They comprise 34% of the adopters of technology. They are distinguished from the early majority by exhibiting a more careful approach characterized by heightened risk aversion and resistance to change. Unlike early adopters, they demand extensive reviews and evidence of the technology's benefits before making adoption decisions, so they need more time for taking action. Following them, laggards represent the final group of adopters. They make up 16% of the total number of adopters. They are known for being traditionalists. Also, laggards are inherently resistant to change and prefer to observe the extensive adoption of new technologies within their community before considering adoption decision themselves (Rogers, 2010; Guttentag, & Smith, 2022). This distinctive grouping of technology adopters, outlined by Rogers (2010), illustrates the gradual dissemination of innovations within communities. where each group of adopters plays a distinct role in the widespread adoption and integration of new technologies.

Furthermore, within the framework of the Diffusion of Innovation (DOI) theory, Rogers pointed out the presence of five fundamental factors that contribute to the diffusion and adoption of new innovations. These factors include trialability, compatibility, relative advantage, complexity, and observability. Trialability refers to the opportunity for potential adopters to experiment with and adjust the innovation to suit their requirements. Where compatibility is the degree to which the innovation aligns with the organization's values, previous experiences, and the needs of potential adopters. Relative advantage is related to the perceived advantage of an innovation over its predecessors or existing alternatives. Complexity, on the other hand, denotes the level of difficulty associated with understanding and implementing the innovation. Finally, observability encompasses the extent to which the innovation and its outcomes are observable by potential adopters (Rogers, 2010; Guidolin, & Manfredi, 2023). These factors, as explained by Rogers (2003), play a crucial role in shaping the adoption process. Also, in influencing individuals' perceptions and decisions regarding the adoption of new innovations.

From another perspective, the Diffusion of Innovation (DOI) theory delves into technology adoption through the lens of the decision-making process. According to Rogers (2003), decision-making starts with information seeking and processing aimed at mitigating uncertainty regarding innovation and its positive and negative consequences. Rogers described five stages within this

decision-making process: knowledge, persuasion, decision, implementation, and confirmation, respectively (Rogers, 2003; Rogers 2010). This framework highlights the sequential progress that individuals experience when starting the adoption of new technologies. It also emphasizes the importance of information acquisition and evaluation in shaping adoption decisions (Rogers, 2010; García-Avilés, 2020).

First of all, In the Knowledge stage, prospective adopters become familiar with the innovation. They start to seek additional information regarding its characteristics, functionality, and purpose. Despite possessing awareness of the innovation, its advantage, and benefits, individuals may give up adopting it. This uncertainty stems from the influence of individuals' attitudes toward the innovation, which can either incline them to accept or reject it (Rogers, 2003; García-Avilés, 2020; Schuyler et al., 2021).

Subsequently, based on individuals' understanding of the innovation, which was established in the Knowledge stage. This understanding serves as the foundation for efforts to influence their views toward the innovation by providing opportunities for actual experience, during the Persuasion stage (García-Avilés, 2020). At this stage, individuals' attitudes are influenced by the evaluations and feedback provided by peers and colleagues regarding the innovation. Because they continue seeking assessments and opinions throughout the decision-making process (Schuyler et al., 2021; Das, 2022; Guidolin, & Manfredi, 2023).

After that, the decision stage begins when potential adopters make the choice to either embrace or decline the innovation. While opting for adoption implies a commitment to fully utilize the innovation, rejection may still occur even after initial adoption (Rogers 2010; García-Avilés, 2020). Once a decision is reached, the implementation phase follows, involving the practical application of the innovation. The implementation phase introduces uncertainty regarding the outcomes associated with the innovation's usage. Technical support plays a key role during this stage; because it ensures the seamless adoption and sustained utilization of the innovation (García-Avilés, 2020; Schuyler et al., 2021; Guidolin, & Manfredi, 2023).

The last phase in the decision-making process is the confirmation stage, which holds particular significance as adopters may re-evaluate their attitude toward the innovation. When the

innovation fails to meet their needs and expectations, adopters may choose to discontinue its use. Similarly, if an advanced alternative emerges, adopters may opt to reject the current innovation in favor of the newer one. Consequently, ongoing support for users of the innovation remains crucial to ensure its continued adoption and usage (Rogers, 2010; García-Avilés, 2020; Schuyler et al., 2021, Das, 2022).

However, the DOI model has been applied across various domains and disciplines, including marketing, technology adoption, public health, agriculture, education, and development studies. For example, in marketing, the DOI model is used to form strategies for launching and promoting new products or services, understanding consumer behavior, and segmenting target markets based on adoption characteristics (Schiavone, & Simoni, 2019; Abbas, Haji-Othman, & Cheumar, 2023). In technology adoption, the DOI model guides the design and implementation of technologies by identifying factors that affect user acceptance and adoption rates (Putteeraj, Bhungee, Somanah, & Moty, 2022). In agriculture, the DOI model informs the dissemination of agricultural innovations, adoption of sustainable practices, and improvement of productivity (Manzano, & Pérez, 2023). In education, the DOI model informs the integration of educational technologies, and diffusion of best practices across educational institutions (Adeaba, 2023).

Additionally, the DOI model offers several implications for innovation management and societal change. Firstly, it highlights the role of communication strategies and social networks in influencing the diffusion process and accelerating the adoption of innovations. secondly, it emphasizes the need for policymakers, organizations, and change agents to address barriers to adoption, minimize resistance to change, and create enabling environments that facilitate innovation diffusion. Thirdly, it emphasizes the iterative nature of the diffusion process, wherein feedback loops and learning mechanisms enable continuous adaptation and improvement of innovations over time. Lastly, it emphasizes the potential of innovations to drive positive societal change, address pressing challenges, and contribute to sustainable development goals (Rogers, 2010; Guttentag, & Smith, 2022; Kusumanegara, Putra, Fitriyah, & Muldi, 2022; Cheung, Jayawickrama, Olan, & Subasinghage, 2023).

Finally, the Diffusion of Innovation (DOI) theory serves as a theoretical framework for examining the acceptance and adoption of technology and innovation at both individual and organizational levels. This theory incorporates essential elements relevant to three key aspects of innovation adoption: the attributes of the innovation itself, the characteristics of the adopters, and the decision-making process involved (Gruenhagen, & Parker, 2020; Cheung, Jayawickrama, Olan, & Subasinghage, 2023). However, the DOI model faces various challenges and limitations. These encompass the sophisticated nature of the diffusion process outlined by the model, the impact of contextual variables, and the rapid pace of technological change. Addressing these challenges is crucial for enhancing the understanding of how innovations are adopted and integrated within societies and organizations, to best decide on which technology adoption model to use in research (MacVaugh, & Schiavone, 2010; Gruenhagen, & Parker, 2020).

2.2.7 The Technology- Organization- Environment Model (TOE)

2.2.7.1 Overview of the model

Tornatzky and Fleischer (1990) introduced the Technology-Organization-Environment (TOE) model as a framework for examining technology adoption within organizations. Rooted in the contingency theory of organizations, the TOE model suggests that organizations must adjust and react to changes and innovations within their operational environments (Tornatzky & Fleischer, 1990; Shukla, & Shankar, 2022). Within this model, Tornatzky and Fleischer (1990) identified three key organizational characteristics that shape the decision-making process regarding technology adoption. The TOE model describes three main categories of characteristics: technological, organizational, and environmental, each playing a distinct role in influencing an organization's tendency to adopt specific technologies. The TOE framework offers a comprehensive lens through which researchers can explore the intricate dynamics influencing innovation adoption within organizational settings (Bryan, & Zuva, 2021).

Primarily, technological characteristics encompass the set of available technologies within an organization, potentially enhancing its productivity levels. Secondly, organizational characteristics encompass various organizational traits, including size, structure, and human resource attributes, which contribute to the organization's readiness to embrace new technologies.

Lastly, environmental characteristics encompass the broader context in which the organization operates, encompassing factors such as its business location, competitive landscape, and interactions with regulatory bodies or government entities (Shukla, & Shankar, 2022). These three categories collectively form the foundation of the Technology-Organization-Environment (TOE) model, providing a comprehensive framework for analyzing the determinants of technology adoption within organizational contexts.

On the one hand, The strengths of TOE framework offer several contributions to the field of technology management and organizational studies. As discussed in the previous section, DOI theory primarily emphasizes individual characteristics and internal organizational factors as drivers of technology adoption. The TOE framework surpasses the DOI theory in terms of explanation power, especially when looking at how technology adoption within a single organization. That's because of the inclusion of environmental factors along with technological and organizational ones. This addition is significant as it acknowledges the impact of external factors. The TOE framework gives a deeper understanding of what influences innovation adoption within a company. This approach helps researchers better understand how new technologies spread through an organization and how they change the way things are done (Bryan, & Zuva, 2021; Sastararuji, Hoonsopon, Pitchayadol, & Chiwamit, 2021).

Furthermore, the TOE framework is a valuable tool for generating insights and advancing theoretical understanding in technology adoption context. The TOE framework can be used in many different areas of technological innovation adoption because it's adaptable. While the basic ideas of the framework stay the same, the specific factors researchers look at—like technology, organization, and the environment—might change based on what innovation they're studying and the unique features of the organization they're looking at (Bryan, & Zuva, 2021; Raj, & Jeyaraj, 2023). This flexibility allows researchers to customize their studies to fit specific situations and dig into the details of how innovations are adopted in different kinds of organizations.

Institutional theory promotes additional insights into the Environmental factor (Oliveira & Martins, 2011). Moreover, it suggests that organizational decision-making is influenced not only

by rational considerations but also by social and cultural factors (Oliveira & Fraga, 2011). By incorporating these explanations, institutional theory fills a gap within the TOE model (Soares, Mendes-Fillo, & Gretzel, 2020), which will be elaborated upon in the next section. More than that, TOE is commonly used model as an analytical bases in organizational technology adoption research (Shukla, & Shankar, 2022). Different empirical studies used TOE model as the theoretical base for investigating organizational adoption of new technological innovations (Saldanha & Krishnan, 2012).

On the other hand, While the TOE model offers a comprehensive framework for understanding technology adoption within organizations, it is important to recognize its limitations. The TOE model primarily focuses on organizational and environmental factors, with less emphasis on the role of individual users or stakeholders in the adoption process. This may overlook the importance of human factors, such as user perceptions, attitudes, and behaviors, in shaping technology adoption outcomes. Human factors are inherently complex and multifaceted, encompassing a wide range of psychological, social, and cultural dimensions. The TOE model's tendency to simplify these issues into broader organizational contexts may overlook the influence of human behavior and decision-making in technology adoption (Li, 2020). In the context of this dissertation research, this limitation will be treated by extending the model and considering human factor from psychological dimension, which is FOMO.

2.2.7.2 Previous Research

Siew, Rosli, and Yeow (2020) conducted a study on the adoption of computer-assisted audit tools and techniques (CAATTs) within organizations, utilizing the TOE model as a theoretical framework. Within the technological category, they examined factors such as Relative Advantage, Compatibility, Complexity, Observability, and Trialability. In the organizational category, the study investigated Firm Size, Top Management Commitment, and Employees' IT Competency. Environmental factors included Clients' System Complexity, Competitive Pressure, and Perceived Level of Professional Body Support. The findings revealed that the adoption of CAATTs was significantly influenced by various factors, including Clients' System Complexity, Perceived Level of Professional Body Support, Firm Size, Top Management Commitment, Employees' IT

Competency, Relative Advantage, Compatibility, Observability, and Trialability. This comprehensive analysis sheds light on the multifaceted determinants that impact the organizational adoption of CAATTs.

Lippert and Govindarajulu (2006) studied organizational adoption of web services by applying TOE model and they proposed factors that is influencing the adoption decision. Under technological category Security Concerns, Reliability, and Deployability factors were proposed. Under organizational category Firm Size, Firm Scope, Technological Knowledge, and Perceived Benefit factors were proposed. Under the environmental category Competitive Pressure, Regulatory Influence, Dependent Partner Readiness, and Trust in Web Service Provider factors were proposed.

Chittipaka, Kumar, Sivarajah, Bowden, and Baral (2023) studied organizational adoption of blockchain technology in the context of supply chain in India. Under the technological category, Relative Advantage, Compatibility, Trust, and Security factors were investigated. Under organizational category Firm's IT Resources, Higher Authority Support, Firm Size, and Monetary Resources factors were investigated. Under environmental category, Rivalry Pressure, Business Partners Pressures, and Regulatory Support. Results of the research show that all considered factors were found to be significantly influencing blockchain adoption decisions within organizations.

Ghobakhloo, Arias-Aranda and Benitez-Amado (2011) studied organizational adoption of e-commerce by applying TOE model in SMEs. Under technological category Perceived Relative Advantage, Perceived Compatibility, and Cost factors were investigated. Under organizational category Information Intensity, CEO's knowledge, CEO's Innovativeness, and Business Size factors were investigated. Under environmental category Competition, Buyer/Supplier Pressure, and Support from technology Vendors factors were investigated. Results of the research shows that perceived relative advantage, perceived compatibility, CEO's innovativeness, information intensity, buyer/supplier pressure, support from technology vendors, and competition are the influencing factors in the case of e-commerce adoption in SMEs.

Sulaiman, Mahomed, Rahman, and Hassan (2023) studied organizational adoption of learning management system in universities. The study employed an integrated TOE-TAM model. Within the part of TOE model, the technological category included System Quality, Service Quality, And Information Quality factors were investigated. Under organizational category Technical Support factor was investigated. Under the environmental category Government Support factor was investigated. Results of the research show that all considered factors were found to be significantly influencing adoption decisions. This study highlights the importance of integrating technology acceptance models to provide better insights and understandings of technology adoption decisions.

Ramdani, Chevers and Williams (2013) studied organizational adoption of enterprise systems by applying TOE model. Under technological category Relative Advantage, Compatibility, Complexity, Trialability, and Observability factors were investigated. Under organizational category Top Management Support, Organizational Readiness, ICT experience, and Size factors were investigated. Under environmental category Industry, Market Scope, Competitive Pressure, and External ICT support factors were investigated. Results of the study show that all the investigated factors critically influence organizations to adopt enterprise systems.

Farhat, and Anjum (2024) studied organizational adoption of Artificial Intelligence AI in the context of recruitment and selection in Pakistan. The study conducted an exploratory study by intervening managers to identify factors that influence their intention to adopt AI tools in recruitment process. after that, they categorized these factors using TOE model to create a conceptual model for future research. Under technological category Relative Advantage, Cost Effectiveness, and Complexity factors were identified. Under organizational category Technological Competency, Size of firm, and Support of Top Management factors were identified. Under environmental category Competitor Pressure, AI Vendor Support, and Job Seeker pressure factors were identified.

Oliveira, Thomas and Espadanal (2014) studied organizational adoption of cloud computing by applying TOE model. Under the technological category Relative Advantage-Security concerns, Cost Savings, Complexity, Compatibility, and Technology readiness factors

were tested. Under organizational category Top Management Support, and Firm Size factors were tested. Under the environmental category Competitive Pressure, and Regulatory Support factors were tested. Results of the study show that relative advantage, complexity, technological readiness, top management support, and firm size influence organizational adoption of cloud computing.

Kajla, Sood, Gupta, Raj, and Singh (2023) studied organizational adoption of blockchain technology in the banking context. Under the technological category, Relative Advantage, Complexity, Compatibility, Standardization, Scalability, and Trust factors were studied. Under organizational category IT Resources, Top Management, Support, and Size of the Organization factors were studied. Under environmental category, Financial Resources, Pressure from, Competitors, Clientele Pressure, Policies and Regulations by Government, and Inter-Organizational Trust factors were studied. Results of the research show that the most significant criterion for blockchain adoption in the banking sector is the organizational category, followed by the environmental category. In contrast, the technological category was found to be the least influential criterion on blockchain adoption in the banking sector.

Gangwar, Date and Ramaswamy (2015) studied organizational adoption of cloud computing by applying TOE model and TAM model. Under technological category Relative Advantage, Compatibility, and Complexity factors were studied. Under organizational category Organizational competency, Top Management, and Training and education factors were studied. Under the environmental category Competitive Pressure, and Trading partner support factors were studied. Results of the study show that all studied factors influence organizational adoption of cloud computing.

Baral, Chittipaka, Pal, Mukherjee, and Shyam (2023) studied organizational adoption of blockchain in the context of supply chain management. Under technological category Relative Advantage, Security, Perceived Benefits, and Cost were tested. Under organizational category Top management support, Organizational readiness, and Blockchain Knowledge were tested. Under the environmental category Competitive pressure, Regulatory environment, and Government support were tested. Results of the research show that all factors that were tested were found to be significantly influencing blockchain adoption in food retail supply chain. This research highlights

the importance of considering and understanding all factors that surround blockchain technology for benefiting from its potential. And on the quality of products and services presented by organizations.

Awa, Ojiabo and Emecheta (2015) studied organizational adoption of e-commerce in SMEs. Under technological category Perceived Usefulness, Perceived Ease of Use, Perceived Behavioral Control, and Perceived Service Quality factors were listed. Under Organizational category Scope of Business Operations, Firm's Size, Organization Mission, Facilitating Conditions, Individual Difference Factors, and Social Influence or Subjective Norms factors were listed. Under the environmental category Consumer Readiness, Competitive Pressure, Trading Partners' Readiness, and Perceived Trust factors were listed. The study was a conceptual study that aimed at integrating technology adoption models to conclude a research model with common factors. They recommended the use of these factors in investigating organizational technology adoption.

Bag, Rahman, Gupta, and Wood (2023) studied organizational adoption of blockchain technology in SMEs. Under technological category, Relative advantage, Compatibility, and Complexity were investigated. Under organizational category, Top Management support, and Organizational readiness were investigated. Under environmental category, Competitive pressure, External support from vendors, and Regulations and legislations were investigated. Results of the research shows that all eight factors investigated in their research significantly influence blockchain adoption in SMEs in South Africa. Also, these findings highlight that blockchain technology is essential to support firms' performance.

Lutfi, Idris, Mohamad (2016) studied organizational adoption of Accounting Information Systems in SMEs. Under the technological category Relative Advantage, and Compatibility factors were investigated. Under organizational category Organizational Readiness, and Owner/Manager Commitment factors were investigated. Under the environmental category Competitive pressure, Government Support, and Networking factors were investigated. Results of the study showed that adoption was influenced by these factors: compatibility, owner/manager commitment, organizational readiness, competitive pressure, and government support.

Bany Mohammad, Al-Okaily, Al-Majali, and Masa'deh (2022) studied organizational adoption of Business Intelligence in the banking context in Jordan. Under technological category, Data-related Infrastructure Capabilities, Technology Supporting Infrastructure, and Data Management Challenges were studied. Under organizational category, Top Management Support, Presence of Champion, and Talent Management Challenges were studied. Under the environmental category Competitive Pressure, External Market Influence, and Regulatory Compliance were studied. Results of the research show that all nine factors that were investigated were found to significantly influence BIA in the banking sector. The researchers highlighted the importance of organizational factors for successful technology adoptions within organizations.

Chandra and Kumar (2018) studied organizational adoption of augmented reality in e-commerce by applying TOE model. Under technological category Technological competence, and Relative Advantage factors were investigated. Under organizational category Decision-makers knowledge, Financial Strength, and Top Management Support factors were investigated. Under the environmental category Consumer Readiness, and competitive pressure factors were investigated. Results of the study showed that adoption was influenced by these factors: Technological competence, Relative Advantage, Decision-makers knowledge, Top Management Support, and Consumer Readiness.

Skafi, Yunis and Zekri (2020) studied organizational adoption of cloud computing in Lebanon by applying TOE model and contextual theory. Under technological category Cost, Relative Advantage, Privacy and Security, Compatibility, Complexity, and Trialability factors were tested. Under organizational category Size, Top Management Support, Innovativeness, Prior Technological Experience factors were tested. Under the environmental category Competitive Pressure, Sector, Market Scope, and Supplier Computing Support factors were tested. Also, additional category was added to the model depending on contextual theory. Political issues, IT Infrastructure, and Government Initiatives were tested as contextual factors. Results of the study shows that Complexity, Security Top Management Support, Prior IT Experience, Poor IT Infrastructure, and Lack of Governmental support are critical factors influencing adoption decision in Lebanese organizations.

Ngah, Thurasamy, Salleh, Jeevan, Hanafiah, and Eneizan (2021) investigated the adoption of halal transportation by manufacturers in Malaysia using the TOE model as a framework. Within the technological category, they examined factors such as Cost and Perceived Usefulness. The organizational category was represented by the Readiness factor, while the environmental category included the Customer Pressure factor. The findings of the study revealed that the adoption of halal transportation was significantly influenced by Cost, Perceived Usefulness, and Customer Pressure. This suggests that organizations consider not only the technological aspects and their internal readiness but also external pressures from customers when making decisions about adopting halal transportation. The study highlights the importance of considering various factors within the technological, organizational, and environmental contexts in understanding adoption decisions in the transportation sector.

Setiyani and Rostiani (2021) studied organizational adoption of e-commerce in Indonesia by SMEs. Under technological category Compatibility, Perceived Usefulness, Complexity, security concerns, and Relative advantage factors were investigated. Under organizational category Cost, Organizational Readiness, Top Management Support, Organization Size, and Organization Culture factors were investigated. Under the environmental category Government Support, Competitive Pressure, Environmental Uncertainty, and Vendor Quality factors were investigated. Results of the study shows that all the investigated factors critically influence organizations in Indonesia to adopt e-commerce systems.

2.2.7.3 Summary of Previous Research

Table 1 TOE previous research

Source	Technology	Model	Type of Study	Data Collection Method	Analysis Technique
Siew et al. (2020)	Computer-Assisted Audit Tools And Techniques	TOE	Quantitative	Surveys	PLS-SEM technique
Lippert and Govindarajulu (2006)	Web Services	TOE	Model Proposal	-	-
Chittipaka et al. (2023)	Blockchain	TOE	Quantitative	Surveys	Structural Equation Modelling
Ghobakhloo et al. (2011)	E-Commerce	TOE	Quantitative	Surveys	Multiple Regression
Sulaiman et al. (2023)	Learning Management System	integrated TOE-TAM	Quantitative	Surveys	Structural Equation Modelling
Ramdani et al. (2013)	Enterprise Systems	TOE	Quantitative	Interviews	PLS-SEM technique
Farhat, & Anjum (2024)	Artificial Intelligence	TOE	Qualitative	Semi-Structured Interviews	Excel and TagCorowd
Oliveira et al. (2014)	Cloud Computing	integrated TOE-DOI	Quantitative	Surveys	Structural Equation Modelling
Kajla et al. (2023)	Blockchain	TOE	Quantitative	Surveys	Fuzzy-AHP
Gangwar et al. (2015)	Cloud Computing	integrated TOE-TAM	Quantitative	Surveys	Structural Equation Modelling
Baral et al. (2023)	Blockchain	TOE	Quantitative	Surveys	Structural Equation Modelling

Awa et al. (2015)	E-Commerce	integrated TOE-TAM-TPB	Model Proposal	-	-
Bag et al. (2023)	Blockchain	integrated TOE-resource-based view	Quantitative	Surveys	CB-SEM and ANN
Lutfi et al. (2016)	Accounting Information Systems	TOE	Quantitative	Surveys	PLS-SEM technique
Bany Mohammad et al. (2022)	Business Intelligence	TOE	Quantitative	Surveys	SPSS
Chandra & Kumar (2018)	Augmented Reality In E-Commerce	TOE	Quantitative	Surveys	PLS-SEM technique
Skafi et al. (2020)	Cloud Computing	TOE	Quantitative	Surveys	Logistic Regression
Ngah et al. (2021)	Halal Transportation	TOE	Quantitative	Surveys	SMART PLS
Setiyani, & Rostiani (2021)	E-Commerce	TOE	Quantitative	Surveys	SMART PLS

2.3 Institutional Theory

2.3.1 Overview of the Theory

In the dynamic view of organizational studies and technological developments, understanding the sophisticated interaction between institutional theory and technology adoption has become critical. Institutional theory, a foundation stone of organizational sociology, offers a lens through which it helps in understanding how organizations are influenced by their external environments, particularly by social norms, values, and regulations. On the other hand, technology adoption stands as a fundamental process in modern society, by affecting the competitiveness, efficiency, and innovation capabilities of organizations across various sectors (Soares, Mendes-Fillo & Gretzel, 2020).

In academic research, institutional theory is extensively employed to explain the drivers behind technology adoption in organizations, by shedding light on the underlying motives behind adoption. Furthermore, it offers insights into how organizations operating within similar institutional contexts tend to show similarities in their approaches to technology implementation. Institutional theory searches for the mechanisms by which organizations conform to external pressures, norms, and structures within their institutional environments. Institutional theory is rooted in sociology and organizational behavior, this theoretical framework suggests that organizations are not only driven by internal factors such as efficiency and profitability but also by external forces including societal expectations, cultural norms, and regulatory frameworks (Furusten, 2023). Fundamentally, institutional theory serves as a framework for examining how organizations reinforce their capacity to succeed within competition by gaining legitimacy and adopting perceptions of legitimacy among stakeholders. It explores strategies for enhancing organizational viability and resilience in dynamic environments (DiMaggio & Powell, 1983). Institutional theorists argue that organizations look for legitimacy and stability by conforming to established institutional logics, even if such adherence may not always align with rational economic principles (Furusten, 2023).

Institutional theory developed in the late 1970s and early 1980s as a response to the limitations of classical management theories and rational choice theories in explaining organizational behavior. Unlike rational choice theory that emphasizes individual decision-making based on self-interest and utility maximization, institutional theory shifts the focus to the broader socio-cultural and political contexts within which organizations operate (Moutsios, 2023). At its core, institutional theory suggests that organizations are not only rational actors driven solely by economic considerations but are also deeply influenced by the norms, values, and structures established in their institutional environments. These institutional environments comprise a complex network of formal regulations, cultural norms, professional standards, and symbolic meanings that shape organizational behavior and outcomes (Bag, Pretorius, Gupta, & Dwivedi, 2021; Furusten, 2023).

According to institutional theory, organizations function within an institutional environment defined by its regulations, norms, and principles controlling organizational behavior

and interactions. This perspective highlights the influence of broader societal structures on organizational behavior. The theory has three main concepts as follows: first Institutional Environment, The institutional environment refers to the broader socio-cultural, political, and regulatory context within which organizations operate. It includes formal institutions such as laws, regulations, and government agencies, as well as informal institutions such as cultural norms, industry conventions, and professional associations. The institutional environment applies significant influence on organizations by setting expectations, providing resources, and shaping legitimacy (Moutsios, 2023).

The second main concept in institutional theory is institutional logic. Institutional logic refers to the underlying belief systems, values, and assumptions that guide organizational behavior and decision-making. These logics help individuals and organizations in understanding their daily tasks and arranging them chronologically and spatially. Different institutional logics may exist within an organizational field, reflecting diverse stakeholder interests, professional norms, and cultural traditions. For example, the healthcare industry may be characterized by multiple institutional logics, including those of medical professionals focused on patient care, administrators concerned with cost containment, and policymakers emphasizing public health objectives. These competing institutional logics can shape organizational priorities, strategies, and practices (Haveman, Joseph-Goteiner, & Li, 2023).

The third and final key concept in institutional theory is organizational isomorphism, denoting the tendency of organizations to increasingly resemble one another as they conform to fundamental institutional norms. This merging highlights the influence of established institutional frameworks on organizational structures and practices. Isomorphism shows through various institutional pressures, as defined by DiMaggio and Powell (1983).

Institutional theory outlines three significant institutional powers driving organizational change: mimetic powers, normative powers, and coercive powers. Mimetic powers stem from the perception that imitating successful competitors within the same environment yields benefits, by stimulating organizations to replicate practices in the cares of uncertainty or limited alternatives. This mimetic behavior reflects a tendency to mirror established norms or practices within an

industry, often in response to perceived success factors or uncertainty in deciding on optimal strategies. Mimetic pressures force organizations to mimic one another, thereby leading to the emergence of uniform organizational structures and norms (DiMaggio & Powell, 1983). Within the technology adoption context, the decision to embrace novel technologies involves inherent risks. Consequently, organizations often choose to mimic a prominent competitor within their shared environment, observing their actions regarding the adoption or rejection of emerging technologies (Soares, Mendes-Fillo & Gretzel, 2020). This tendency to mimic influential peers reflects a strategic approach to navigating technological risks and uncertainties.

Coercive powers, as explained by DiMaggio and Powell (1983), refer to the influence exerted on organizations by external entities, which could include other organizations or governmental bodies. This form of pressure causes organizational change, often leading to conformity with external authorities or legal frameworks. In the technology adoption context, coercive pressures drive organizations to integrate specific technologies to comply with government regulations or to facilitate interoperability with partner organizations, as highlighted by Soares, Mendes-Fillo and Gretzel (2020). Thus, coercive pressures force organizations to adapt their technological strategies to align with external opportunities and requirements.

Normative powers refer to the influence applied by established norms and standards within an institutional environment, forcing organizations to adhere to accepted practices to gain legitimacy and operational viability (DiMaggio & Powell, 1983). This form of pressure arises from the need to conform to established norms and gain social acceptance within their institutional fields. In the domain of technology adoption, organizations often find themselves obligated to adopt specific technologies and adhere to imposed norms outlined by trade associations or certification programs, as concluded by Soares, Mendes-Fillo and Gretzel (2020). Thus, normative pressures drive organizations to align their technological strategies with industry standards to enhance legitimacy and credibility.

Westphal, Gulati and Shortell (1997) conducted a study to understand adoption motives of new innovations, and they differentiate between early and later adopters. The finding of the study suggests that later adopters would be more likely than early adopters to conform to the normative

pattern of quality practices introduced by other adopting organizations. Early adopters of Total Quality Management (TQM) practices were motivated by efficiency concerns. Where later adopters conformed more closely to the normative pattern of quality practices introduced by other adopting organizations. The study also addressed the impact of social network ties on institutionalization. It provided consistent evidence for network effect in the form and consequences of innovation adoption. Network ties decreased conformity to normative TQM adoption for early adopters and increased conformity for late adopters.

In addition to that, Usman, Kusuma, and Ardiansyah (2022) have studied Islamic Finance adoption based on institutional theory perspective. The researchers suggested that organizations may adopt Islamic finance not only based on rational considerations, but also due to efforts to achieve legitimacy in their larger environment. The research examined isomorphism pressure in the external organization environment, corporate governance in the internal organization environment, and the individual characteristics of the managers to predict the behavior of organizations in adopting Islamic finance. The results of the study showed that coercive pressure and mimetic pressure positively influence Islamic finance adoption. Where normative pressure had no significant influence. These findings contribute to the explanation power of institutional theory.

Institutional theory explains that considerations behind decisions taken in the organization are more than just rational considerations. In this context the literature introduced that when an organization attempts to take adoption decision it takes into consideration the three institutional powers (Soares, Mendes-Fillo & Gretzel, 2020). A vital contribution of institutional theory in the context of technology adoption is that it explained that organizational decisions are based on social and cultural factors in addition to rational factors. While at the same time conforming with environmental standards and pressures helps organizations to survive and develop (Oliveira & Fraga, 2011).

In this sense, institutional theory contributes to the explanation of technology adoption decisions. Hence, Institutions play a crucial role in shaping organizational behavior and decision-making through their influence on three key procedures: legitimacy, resource dependence, and socialization. First of all, Institutions provide organizations with legitimacy, which is essential for

their survival and success in the environment. Legitimacy refers to the perceived appropriateness or acceptability of an organization's actions, practices, and structures in the eyes of relevant stakeholders (Bitektine & Song, 2023; Furusten, 2023). Organizations that conform to principal institutional norms and expectations are more likely to be perceived as legitimate by stakeholders, including customers, investors, regulators, and the general public. Legitimacy enhances an organization's reputation, trustworthiness, and access to resources, thereby facilitating its long-term viability and competitiveness (Bitektine & Song, 2023; Furusten, 2023).

Moreover, Second procedure is resource dependence, Institutions shape organizational behavior by influencing the distribution and allocation of resources within the environment. Basically, resource dependence theory implies that organizations should engage in transactions with other organizations in their environment to acquire resources. Organizations depend on various resources, including financial capital, human talent, information, technology, and social networks, to achieve their goals and achieve their goals. Institutions control the availability and accessibility of these resources through formal regulations, funding mechanisms, accreditation processes, and industry standards. Organizations must navigate these institutional structures and relationships to secure the resources they need to operate effectively and sustainably (Guler, 2007; Ozturk, 2021).

The third key procedure is socialization, Institutions socialize individuals and organizations into the norms, values, and practices of their respective institutional environments. Socialization processes occur through formal education, professional training, organizational rituals, and informal interactions with peers and mentors. As individuals and organizations internalize institutional norms and values, they develop shared understandings of what is considered appropriate or desirable behavior within their institutional fields. Socialization reinforces institutional logics and raises collective identity and solidarity among organizational members. It also shapes organizational cultures, structures, and decision-making processes by promoting certain behaviors and discouraging others (Moreland, & Levine, 2014; Furusten, 2023).

Integrating institutional theory with the Technology-Organization-Environment (TOE) model proves beneficial for defining factors influencing technology adoption within organizations.

Environmental characteristics within the TOE model are more comprehensively explained through the lens of institutional theory. The three powers of institutionalization serve as valuable tools for examining and analyzing the environmental characteristics encapsulated within the TOE model. Which eventually contributes to the enhancement of general understanding of the organizational adoption of technology (Gibbs & Kraemer, 2004; Mezghani, Alsadi, & Alaskar, 2022; Elghdban, Azmy, Zulkiple, & Al-Sharafi, 2023).

2.3.2 Previous Research

On another stream, a lot of research studies have utilized institutional theory to explore the adoption of technology and innovations within organizational contexts. While some research studies solely rely on institutional theory, others integrate it with alternative models of technology adoption, reflecting diverse approaches to understanding this complex phenomenon. In the remainer of this section a review of recent research examples of the role of institutional theory will be presented.

In their 2013 study, Yoon and George explored the adoption of Virtual Worlds within organizations by merging the Technology-Organization-Environment (TOE) model with the institutional theory. Their integrated model encompassed the three dimensions of the TOE model. Institutional theory was specifically employed to explain the environmental part of the TOE model. With their model, the researchers examined various institutional factors such as Intensity of Competition, Normative Pressure, Customers Pressure, and Competitors Pressure. Their findings revealed that mimetic pressures from competitors and normative pressures significantly impacted organizations' decisions regarding virtual worlds adoption, while technological factors exhibited no marked influence. This highlights the critical role of institutional theory in comprehensively understanding technology adoption dynamics within organizational contexts.

Moreover, in a recent study conducted by Mezghani, Alsadi, and Alaskar (2022), the adoption of big data analytics (BDA) within supply chain management systems in organizations in Saudi Arabia was investigated. The researchers employed a combined approach of institutional theory and the Technology-Organization-Environment (TOE) model. Their research model specifically focused on the environmental factors shaping BDA adoption. Within the context of

institutional theory, the study focused on three key factors: vendor support, trading partner readiness, and competitive pressure. The results indicated that competitive pressure and vendor support showed a direct influence on the intention to adopt BDA among firms in Saudi Arabia. However, trading partner readiness did not exhibit any significant impact on BDA adoption intentions within the context of their study. This highlights the crucial role of environmental factors of the institutional theory in shaping technology adoption dynamics within organizations.

Similarly, Li (2008) studied e-procurement system adoption in manufacturing enterprises in China. The research model was built upon TOE model and institutional theory. Environmental factors were adopted from institutional theory and included: External Pressure, External Support, and Government Promotion. Results showed that in environmental factors external pressure and external support have a significant influence on adoption decision. Also, top management support and relative advantage of the technology are critical factors for e-procurement adoption.

Moreover, Mujalli and Almgrashi (2020) proposed a research model to study audit software adoption on the organizational level by integrating both TOE and institutional theory. Their research model had 9 factors, 3 under each of the three categories of the TOE model. Institutional theory was presented by considering the normative, coercive, and mimetic pressures in the model under the environmental category of the TOE model. The institutional theory in this research helps in understanding how organizations conform to external expectations and norms, affecting their adoption of new technologies. In addition, By applying this theory, researchers can explore how the adoption of audit software enhances the perceived legitimacy of internal auditing departments and promotes alignment with industry norms.

Adding to that, Sastararuji, Hoonsopon, Pitchayadol, and Chiwamit (2021) studied cloud computing adoption during the Covid-19 pandemic in small and medium enterprises. They suggested an integrated research model based on TOE model, DOI theory, and institutional theory. As the pandemic has forced SMEs to adapt to new ways of working, including teleworking and digitalization, institutional theory played a vital role in understanding the changes in the environment and presented ways for responding to this change. This awareness allows SMEs to support their adoption of cloud accounting solutions with institutional norms and expectations.

Which will result in enhancing their flexibility and adaptability in the face of crises like the Covid-19 pandemic. The factors that were included in the conceptual model were confirmed by conducting five semi-structured interviews with key decision-makers who had already adopted cloud accounting for their businesses.

In addition, in their 2008 study, Soares-Aguiar and Palma-Dos-Reis utilized institutional theory alongside the Technology-Organization-Environment (TOE) model to investigate factors influencing the adoption of e-procurement systems in organizations. Within the environmental category, institutional theory was employed to examine factors such as Extent of Adoption among Competitors, Trading Partner Readiness, and Perceived Success of Competitor Adopters. Results revealed that all these environmental factors significantly impacted the adoption of e-procurement systems. Additionally, factors like technology competence and firm size were found to play influential roles in explaining adoption decisions within organizations.

Moreover, Gibbs and Kraemer (2004) also utilized institutional theory along with TOE model to study e-commerce adoption in organizations. Environmental category was explained by institutional theory and included: External Pressure, Government Promotion, and Legislation Barriers. Data was collected by telephone survey of 2139 firms across 10 countries. All the environmental factors were found to be influencing e-commerce adoption decisions. Again, this result supports the importance of considering institutional theory in studying technology adoption on the organizational level.

In other stream, Soares, Mendes-Filho and Gretzel (2020) conducted a qualitative study to explore technology adoption in hotels. The research was conducted considering institutional theory. Collected data was analyzed by applying theory-driven thematic analysis. The results of the study show that memetic pressures are highly influencing in the case of technology adoption drivers in hotels. Hotels tend to imitate each other in the frame of competition. However, coercive pressures from governing bodies have minimum influence on hotels regarding technology adoption. Rather, customers have a higher influence on hotels to adopt technology. Finally, normative pressures had greater influence on hotels than governing bodies pressures. This study

highlights the importance of customers' pressure on organizations that deal and give a high priority for their customers in the case of technology adoption.

Moreover, Jan, Lu, and Chou (2012) conducted a quantitative study to explore e-learning adoption in organizational context for on-job training, by only applying institutional theory. The research model has mimetic, coercive and normative powers as independent variables, and age, income, and gender as control variables. Researchers concluded that normative and mimetic pressures have a significant influence on adopting e-learning system for on-job training. In contrast, coercive pressures have no influence.

More than that, Gupta, Modgil, Gunasekaran and Bag (2020) in their research studied the moderation effect of institutional pressures on Industry 4.0 and digital supply chain adoption in organizations in India. They concluded that among the three pressures, only coercive pressures moderate the relationship between industry 4.0 adoption and studying technology adoption factors. exploration and exploitation to orientation. This conclusion highpoints the power of regularity bodies on organizations in India to adopt latest technological innovations. Importance of this study lies in highlighting the importance of considering institutional theory and institutional powers while

Furthermore, Etemady Jooriaby, Kheradyar & Azadi Hir (2020) have studied accounting information system adoption in Tehran stock exchange companies. To achieve their research goal, they had integrated UTAUT model along with institutional theory. The critical role of institutional theory arises with the results. The results showed that all the three institutional pressures have a positive effect on accounting technology adoption. Also, the study emphasized the critical role of institutional pressures in designing accounting information system's rules and constrains, as these constrains are tailored according to the government's rules and regulations for the financial sector and stock market. Hence, Institutional influence affects how new technologies and information systems are selected or adopted within an organization.

On the same stream, Hartley, Sawaya, and Dobrzykowski (2022) conducted research in order to understand blockchain-based supply chain management systems in organizations. The research was designed based on diffusion of innovation theory and the institutional theory. This

integration allowed the research to be more comprehensive in terms of considering both internal factors -related to the innovation itself and external factors -related to the external environment. A mixed approach of scenario-based experiments and interviews was employed. The results of the study indicated that normative pressures are pushing organizations to be keenly searching for information about blockchain supply chain applications and in turn adopting it. In addition, coercive pressures by imposing regulations and compliance needs, have led organizations to prioritize the need for acquiring and applying blockchain-based supply chain.

To provide a comprehensive overview of previous research in the context of institutional theory contribution to technology adoption studies, it is critical to consider more new recent research too. Institutional theory also can contribute to the understanding of institutionalization of a given technology. Chhina, Chadhar, Firmin, and Tatnall (2023) conducted semi-structured interview to identify which institutional powers is worthy to consider in the case of blockchain adoption. Based on these interviews, they proposed a research model to study the effect of institutional powers on the adoption of blockchain technology. They suggested that the three well-known institutional powers are present and influential on organizational decisions regarding blockchain adoption. In addition to these pressures, they also proposed a fourth institutional power, which is technological pressures. Technological pressure represents the need to examine the technological complexities and align technology with organizational goals. This eventually contributes to the institutionalization of blockchain technology and to the enhancement of decision-making process and technology implementation strategies.

Furthermore, to provide a more critical understanding of contributions of institutional theory to technology adoption context, Ioakeimidou, Chatzoudes, Symeonidis, and Chatzoglou (2023) researched Human Resources Analytics HRA in organizations. Their study took into consideration three main theories: Institutional theory, Resource Based theory, and Diffusion of Innovation theory. In the research model, they employed TOE model to classify the factors derived from these three theories. The relation between resource-based view theory and institutional theory is explained when organizations navigate external pressures, and at the same time leverage internal resources effectively. Such as leveraging human capital and IT infrastructure, to adopt and implement HRA initiatives. This relation was vital for

designing a more comprehensive research model. Research results showed that top management support, and relative advantage are highly influencing adoption decisions. While competitive pressures showed no effect.

Additionally, Bae, Saberi, Kouhizadeh, and Sarkis (2024) have studied blockchain based supply chain management system adoption from institutional theory and game theory perspectives. In their research institutional theory helped in forming an understanding of the economic and competitive outcomes of different decisions taken regarding blockchain adoption. The game theory was employed to understand different scenarios in blockchain adoption. Overall, the findings of the study highlighted the economic and competitive implications of different leadership scenarios in blockchain adoption. Also highlighted the impact of cooperation between firms running in the same institutional environment on technology adoption decisions, which is best clarified in institutional theory.

On the same stream, Özbek, Melén Hånell, Tolstoy & Rovira Nordman (2024) designed a qualitative case study research in order to research the role of mimetic pressure on the adoption of e-commerce adoption in small and medium-sized enterprises. The main focus was to shed the light on the way organizations respond to mimetic powers. The institutional theory contributed to the research by emphasizing the role of legitimacy and Conformity in encouraging firms to adopt new technological innovations, beside explaining how organizations respond to pressures in the environment. The findings showed that organizations responded in three different ways: ignoring the pressure, symbolically adopting e-commerce system, or dismissing the pressure and standing against e-commerce implementation. These findings highlight the challenges involved in aligning business strategies with industry trends and institutional pressures.

More than that, Bag, Pretorius, Gupta, and Dwivedi (2021) in their research applied institutional theory along with resource-based view theory in order study organizational adoption of big data analytics-powered artificial intelligence. The study included the three institutional pressures in the research model. The results show that mimetic, coercive and normative pressures influence adoption decisions in organizations. In some cases, this influence might not be a direct

influence. Eventually, all previously viewed studies highlight the important contribution of institutional theory in explaining technology adoption in organizations.

2.3.3 Summary of Previous Research

Table 2 Institutional theory previous research

Authors	Year	Technology investigated	Theories used	Type of study
Bag, Pretorius, Gupta & Dwivedi	2021	big data analytics-powered artificial intelligence	-institutional theory -resource-based view theory	Quantitative study
Özbek, Melén Hånell, Tolstoy & Rovira Nordman	2024	e-commerce	-institutional theory	Qualitative study
Bae, Saberi, Kouhizadeh & Sarkis	2024	blockchain based supply chain management system	-institutional theory -game theory	Mixed approach
Ioakeimidou, Chatzoudes, Symeon idis & Chatzoglou	2023	Human Resources Analytics	-Institutional theory -Resource Based theory -Diffusion of Innovation theory	Quantitative study
Chhina, Chadhar, Firmin, and Tatnall	2023	blockchain	-Institutional theory	Model proposal
Hartley, Sawaya, and Dobrzykowski	2022	blockchain based supply chain management system	-diffusion of innovation theory -institutional theory	Mixed approach
Etemady Jooriaby, Kheradyar & Azadi Hir	2020	accounting information system	-UTAUT model -institutional theory	Mixed approach
Gupta, Modgil, Gunasekaran and Bag	2020	Industry 4.0 and digital supply chain	-institutional theory	Quantitative study
Jan, Lu, and Chou	2012	e-learning	-institutional theory	Quantitative study

Soares, Mendes-Filho and Gretzel	2020	technology adoption in hotels	-institutional theory	Qualitative study
Gibbs and Kraemer	2004	e-commerce	-institutional theory -TOE model	Quantitative study
Soares-Aguiar and Palma-Dos-Reis	2008	e-procurement systems	-institutional theory -TOE model	Quantitative study
Sastararuji, Hoonsopon, Pitchayadol, and Chiwamit	2021	cloud computing	-TOE model -DOI theory -institutional theory	Mixed approach
Mujalli and Almgrashi	2020	audit software	-institutional theory -TOE model	Model proposal
Li	2008	e-procurement system	-institutional theory -TOE model	Quantitative study
Mezghani, Alsadi, and Alaskar	2022	Big Data Analytics	-institutional theory -TOE model	Quantitative study
Yoon and George	2013	Virtual Worlds	-institutional theory -TOE model	Quantitative study
Usman, Kusuma, and Ardiansyah	2022	Islamic Finance system	-institutional theory	Quantitative study

2.4 Fear Of Missing Out (FOMO)

2.4.1 Overview Of FOMO And Technology Adoption On Micro And Macro Levels

Within organizations, managers at every hierarchical level possess decision-making authority, thereby carrying significant influence over the decision-making process. Their individual characteristics, such as personality traits, cognitive styles, and emotional intelligence, play crucial roles in shaping the decisions being made. Additionally, their attitudes toward risk, adaptability to change, and ethical considerations further impact the decision-making process (Sofi, Reshi, &

Sudha, 2023). Recognized as key factors, managers' beliefs and behaviors shape the organizational context, determining strategic directions, resource allocations, and operational outcomes. Moreover, understanding the complex relationship between these elements is critical for understanding the complexities inherent in organizational decision-making processes. Also, it is important for establishing informed and effective decision-making practices within the organizational context. Psychological characteristics of decision makers also influence technology adoption decisions in organizations (Roberts, & Flin, 2020; Sofi, Reshi, & Sudha, 2023). Based on that, this dissertation looks at the possible effect of FOMO -one of the psychological anxieties that is recognized in psychology field- on blockchain technology adoption in organizations.

FOMO stands for fear of missing out, this term was originally introduced in psychology and then applied into other fields such as marketing, education, technology adoption (Elhai, Yang, Fang, Bai & Hall, 2020). It is defined as a social anxiety that results from perceiving that other people in one's environment and society might be enjoying something that the one who is experiencing the anxiety is not having it too. The anxiety is based on a desire to be always up to date with what other people are doing (Przybylski, Murayama, DeHaan & Gladwell, 2013). FOMO has two primary components: cognitive and behavioral component. Cognitive component implies concern that others are having rewarding experiences from which one is absent. Where the behavioral component implies one's current desire to stay connected with people in his\her social network (Elhai, Yang & Montag, 2020).

Moreover, FOMO is defined as "*a kind of anxiety, a sense that you will be inadequate or left behind if you don't react*" (Salem, 2015 as cited in Zhang, 2018, p 11). Also, FOMO is defined as "*the uneasy and sometimes all-consuming feeling that you are missing out, that your peers are doing something, or in possession of more of something better than you*" (JWTintelligence.com, 2015 as cited in Zhang, 2018, p 11). These definitions highlight the fact that the anxiety results from comparing one's status to others, where the anxiety can result from being late from ones' own goals. However, other definitions in the literature tied FOMO to social networks context. Based on previous definitions and arguments Zhang (2018) introduced a comprehensive, context-free definition of FOMO. FOMO is "*fear of missing an experience that can help the individual attain*

a personal and/or social goal, FOMO is a fear of missing an information or experience that can help the individual attain personal or social goals" (Zhang, 2018 p 15, p 30).

On the individual level, FOMO often serves as a powerful motivator, leading individuals to stay up to the latest trends and innovations in the technological context to avoid feeling left behind or disconnected from their social networks. This motive for social inclusion and relevance drives a continuous cycle of technology adoption. Where individuals feel the necessity to acquire or engage with new devices, applications, or platforms to maintain their sense of connectedness and belonging (Elhai, Yang, Fang, Bai & Hall, 2020). One way in which FOMO drives technology adoption is through the perception of social status and prestige associated with owning or using the latest devices or digital tools. The fear of being perceived as outdated motivates individuals to invest in these technologies as a means of indicating their relevance and social status to others (Elhai, Yang & Montag, 2020; Alabri, 2022).

In another way, FOMO drives individuals to adopt new technologies as a means of participating in shared experiences or cultural phenomena that are facilitated by digital platforms. Whether it's joining a popular social media app to stay connected with friends and family, participating in virtual events or communities, or engaging with trending topics and memes, individuals are driven by the fear of missing out on the collective trends of technological culture (Elhai, Yang & Montag, 2020; Alabri, 2022). Eventually, FOMO may lead individuals to act and acquire new technologies out of the desire to catch up with latest trend rather than satisfying a real need.

On one hand, in the context of adopting new technological trends, FOMO can have positive consequences for individuals in many ways. First, it can lead to enhanced individuals' connectivity and communication with their friends, family, and peers in their social networks. Also, it can help them to have access to information and opportunities by adopting new technologies. The wide opportunities and choices that are offered on different technological platforms can only be explored when individuals are motivated to catch up with modern technologies. Finally, FOMO can increase one's technological knowledge and skills because they'll need it to access these technological applications and trends (Kisilowska, 2021; Bui, Krishen, Anlamlier, & Berezan, 2022).

On the other hand, in the context of adopting new technological trends and innovations, FOMO has some negative effects on individuals. As widely discussed in the literature, FOMO can lead to problematic use of technologies such as smartphones and social media (Alshakhsi, Babiker, Montag, & Ali, 2023). Also, FOMO creates a financial burden for individuals if they embrace the habit of constantly upgrading to the latest devices or subscribing to unneeded multiple digital platforms. Moreover, excessive reliance on digital technologies driven by FOMO can lead to social isolation and disconnection from real-world interactions. In addition, FOMO-driven technology adoption can make feelings of anxiety, inadequacy, and self-doubt worse as a result of constant search for validation through digital interactions (Bui et al, 2022; Alshakhsi et al, 2023).

However, studies that examined FOMO effect at individual level concluded that FOMO has negative consequences within technology adoption context. Negatively FOMO leads to waste of time, effort, and money on some technology that is either not beneficial or not really needed by individuals. A popular example is smartphones adoption, most of these technology adopters did not really need it, or some of them did not used all this technology's potentials and services (Gezgin, 2018). Other studies related FOMO to problematic use of smartphone technology (Wang et al, 2019). Eventually, individuals can mitigate the negative impacts of FOMO by increasing their awareness and embracing a healthier relationship with technology (Alabri, 2022; Alshakhsi et al, 2023).

Moving to the macro level, despite the limited number of studies in the literature regarding FOMO in organizations, FOMO effect has been noticed on the organizational level too (Mari, Mandelli, & Algesheimer, 2024). FOMO applies an intense influence on decision-making processes surrounding technology adoption. Within the hypercompetitive business environments, organizations are under constant pressure to innovate and remain ahead of the competitors to retain their competitive edge. FOMO worsens this pressure, as companies fear falling behind their peers or industry rivals who may be benefiting from emerging innovations and technologies. As a result of that, organizations may rush to adopt new technologies without fully evaluating their suitability or aligning them with an organization's long-term goals. Such decisions may be driven by the fear of missing out on potential opportunities or being perceived as laggards in the marketplace (Fridchay, & Reizer, 2022; Mari et al, 2024).

Fear of missing out can lead organizations to adopt new technologies. This can be either an advantageous or disadvantageous adoption depending on how they handle it. Sometimes, FOMO drives innovation, by pushing companies to try new things and stay ahead in their industry. By being proactive, learning, and trying new things, companies can use FOMO to grow and stay competitive (Mari et al, 2024). However, if organizations are following their FOMO without careful thought, it can lead to bad decisions and wasted money. They might rush into trendy technologies without thinking about if they're right for them in the long run. This could mean missing important things like whether the technology is practical, can grow with the company, and fits with their overall goals (Dinçer, Saygın, & Karadal, 2022).

To mitigate the risks associated with FOMO-driven technology adoption, it's important for organizations to take a balanced approach. This involves carefully evaluating the benefits and drawbacks of adopting new technologies and considering how they align with the organization's overall goals and strategies. They should carefully consider their options, plan well, and make sure their choices match their long-term plans. By promoting smart decision-making and teamwork, organizations can use FOMO positively to innovate and stay competitive, while avoiding the downsides of impulsive technology adoption (Dinçer et al 2022; Fridchay, & Reizer, 2022; Mari et al, 2024).

On the same stream, organizations can balance the influence of FOMO in their technology adoption processes by taking into consideration a set of procedures. First, they should align technology adoption with strategic objectives by focusing on technologies that support their core mission and business priorities. Strategic planning involves setting clear goals, developing actionable strategies, and allocating resources effectively to achieve desired outcomes. By taking a strategic approach to technology adoption, organizations can ensure that investments align with their broader objectives and contribute to sustainable growth, rather than FOMO driven strategy planning (Namazi, M., & Rezaei, 2023). Also, they should encourage a culture of informed decision-making by encouraging open dialogue, collaboration, and critical thinking within the organization. In addition, they should conduct pilot projects before committing to large-scale technology implementations, to assess the feasibility and effectiveness of new technologies (Dinçer et al 2022; Mari et al, 2024).

2.4.2 FOMO and Decision-Making process

Fear Of Missing Out is a powerful psychological phenomenon that can greatly impact decision-making (DM) processes within organizations. A report published in 2015 concluded that business leaders are influenced by their FOMO when they decide to expand to the international market. Desire for growth was not the influencing factor for expansion decisions as expected, rather fear of missing out on what competitors are doing and missing out expansion gains was the main motive for such corporate decisions. This study included more than 2500 chief executive officers worldwide (Grantthornton.tw, 2021). Although the report was not published in an academic journal, still it indicates that FOMO do have an influence and effect over managers' decisions in organizations.

In addition to that, when individuals experience FOMO, their judgment, reasoning, and ability to decode information can be influenced in two significant ways. First of all, FOMO can influence decision-maker's judgment negatively by creating a sense of urgency or anxiety about potentially missing out on something important. This increased emotional state can lead to unplanned decisions or a tendency to prioritize short-term gains over long-term considerations (Gartner, Fink, & Maresch, 2022). For example, a manager might quickly adopt a new technology simply because they fear falling behind competitors, without thoroughly evaluating its suitability for their organization.

Moreover, FOMO can also motivate individuals to align their actions and decisions with those of a reference group or peers. In organizational settings, this could mean following industry trends or imitating the technology adoption behaviors of other companies perceived as successful. Decision-makers may feel forced to adopt certain technologies simply because others are doing so, even if it may not be the best fit for their specific needs or strategic objectives (Kang, He, & Shin, 2020). In this sense, the institutional theory presented a similar explanation for some technology adoption decisions. The three institutional powers -discussed in the previous sections- may force organizations and decision makers to adopt unneeded or unfitted technologies (DiMaggio & Powell, 1983; Soares, Mendes-Fillo & Gretzel, 2020).

In these both situations discussed, understanding and accounting for FOMO is crucial because it can provide valuable insights into why certain technology adoption choices are made. By recognizing the influence of FOMO, organizations can better understand the underlying motivations driving decision-making processes. This understanding goes beyond traditional social forces and individual biases, by shedding the light on the complex relationship of emotions, social dynamics, and external pressures shaping technology adoption decisions (Sofi, Reshi, & Sudha, 2023). Simply, acknowledging the role of FOMO in decision-making allows organizations to develop more comprehensive strategies for technology adoption. By addressing the underlying fears and motivations driving decision-makers, organizations can make more informed and effective choices that align with their long-term goals, objectives, and strategies (Kang et al, 2020; Gartner et al, 2022; Sofi et al, 2023).

In addition to that, a study conducted in Switzerland confirmed that employees, managers, and decision-makers experienced FOMO when deciding on an emerging innovative technology in three different ways. First of all, Firm-level FOMO, this type of FOMO relates to technology innovations at the organizational level. Decision-makers might worry about not keeping up with competitors or industry standards, feeling a need to stay relevant and prioritize actions based on what others are doing. This fear is often driven by a desire to maintain professional relevance and competitiveness in the market. As a result, decision-makers may feel pressured to prioritize actions and investments that align with the technological choices of others in their industry. This focus on external environment and what others are doing can affect how the company makes strategic decisions, like which technologies to use and how to run the business (Mari et al, 2024).

The second type of FOMO in organizations is Team-level FOMO. This type is experienced when internal teams within an organization feel pressure to adopt certain technologies based on the choices made by other teams. Decision-makers in these teams might worry about falling behind their peers, which can affect both their professional standing and personal satisfaction. This internal dynamic can lead to actions driven by a desire to keep pace with or outperform other teams (Mari et al, 2024). Consequently, decisions about technology adoption and other strategic initiatives may be influenced by this sense of competition or fear of missing out, shaping the organization's internal dynamics and collaborative efforts.

The third and final type of FOMO in organizations is Employee-level FOMO. This type emerges when decision-makers experience a fear of missing out in comparison to their colleagues, whether within the organization or externally. This form of FOMO can have consequences on both personal and professional aspects of their lives. It motivates them to prioritize their own interests to avoid feeling left out. Consequently, managers may engage in self-centered actions aimed at capturing perceived opportunities or experiences. In turn, this type of FOMO can influence their decision-making processes, affecting not only their interactions within the workplace but also their overall well-being and satisfaction (Fridchay, & Reizer, 2022; Mari et al, 2024). Recognizing and addressing employee-level FOMO is essential for fostering a collaborative and inclusive work environment conducive to mutual support and growth.

Fear of Missing Out (FOMO) significantly influences corporate decision-makers' adoption of emerging innovative technologies. FOMO is an emotional response triggered by the decision context, impacting conscious and nonconscious decision-making levels. This emotional response is either triggered by technology itself or by competitors. Also, FOMO can lead to biased technology evaluations, by favoring popular but immature technologies due to the fear of missing out on potential benefits or competitive advantages. Which potentially results in deviating from strategic goals (Gartner et al, 2022; Sofi et al, 2023).

In addition, FOMO influence decision making process in organizations by inflating Decision-makers’ expectations about technology outcomes. Decision-makers may overestimate the positive or negative impacts of adopting a technology due to the emotional influence of FOMO, potentially leading to negative effect on decision’s quality. More than that, FOMO drives decision-makers to seek innovative opportunities to regulate emotions and avoid missing out on professional differentiation. This can drive them to explore new technologies and opportunities to stay ahead in the market (Dinçer et al, 2022; Alabri, 2022; Gartner et al, 2022). Understanding and managing emotions, particularly FOMO, are crucial in the decision-making process for emerging technologies with uncertain market potential.

To sum up this section, Organizations can mitigate the negative impact of Fear of Missing Out (FOMO) on technology adoption decisions by enhancing executives' emotional self-awareness

to make informed decisions by understanding FOMO implications. Also, decision-makers should be encouraged to make a comprehensive assessment of personal and collective motives to avoid FOMO-driven choices through rational and intuitive analysis. And finally, organizations should conduct frequent self and company-level audits to identify and address FOMO biases, ensuring decisions are not overly influenced by FOMO (Alabri, 2022; Gartner et al, 2022, Namazi, & Rezaei, 2023; Mari et al, 2024).

2.4.3 Previous research of FOMO

In the existent literature, most studies were based on investigation of FOMO at the individual level, and more specially the studies were focused of studying the effect of social media and smart phones in the context of FOMO. These studies have explored how the extensive use of social media platforms and the widespread adoption of smartphones have influenced individuals' experiences of FOMO. Researchers have explored various sides, including the psychological, social, and behavioral ramifications of excessive social media usage and smartphone dependency on feelings of FOMO (Jupowicz-Ginalska, Kisilowska, Baran, Wysocki & Jasiewicz, 2020; Utomo, Kurniasari, & Yudiono, 2021). On the other hand, studies of FOMO effect on the organizational level are limited (Gartner, Fink, & Maresch, 2022). The purpose of this study is to examine FOMO at the organizational level. FOMO is hoped to present additional explanation of the motives behind technology adoption decision in organizations. Adopting the new trending Blockchain technology is based on a real need or a fear?

Since the majority of FOMO studies in the literature were based in social media context, scales that have been used to measure it need to be adopted to other contexts (Utomo, Kurniasari, & Yudiono, 2021). FOMO should not be limited to social media and smart phones contexts. Since FOMO is psychological anxiety, it is related to any context that is related to humans and their social environment. FOMO exhibits various aspects of human interaction and experience. This broader perspective acknowledges that the feeling of being left out or not being part of something significant can arise in diverse contexts beyond just social media usage (Utomo, Kurniasari, & Yudiono, 2021). Thus, understanding and addressing FOMO requires a comprehensive approach that encompasses the multifaceted nature of human social dynamics and aspirations. Therefore,

Zhang (2018) developed a context free scale for FOMO with the objective of measuring the FOMO anxiety in different contexts and settings. Their scale will be adopted in this dissertation as will be discussed in the next chapter.

Esfahani, Nilashi, Rahman, Ghapanchi & Zakaria (2015) studied a set of psychological factors that influence managers' intention and decisions regarding adopting new technology. In their study, the Green Information Systems was the technology under investigation. The researchers concluded that technology adoption decisions in organizations are related to and effected by manager's psychological aspects such as self-efficacy, ethical climate, values, and personal norms. Recognizing and understanding these psychological aspects is crucial for realizing the complexities involved in technology adoption processes within organizational settings. In the sense that FOMO is a psychological phenomenon, FOMO can be an effecting factor in the case of blockchain technology adoption at the organizational level too. In other words, Fear of missing out can influence decision-makers within organizations to adopt blockchain technology, driven by the desire to keep pace with industry trends or to avoid being left behind by competitors who have already embraced blockchain (Soares et al, 2020).

In their research, Gartner, Fink, and Maresch (2022) studied the role of FOMO on decision makers' adoption intention of manufacturing technologies. Their quantitative research was conducted by surveying managers at different small medium-sized enterprises SMEs. The model included the following variables: FOMO, prior experience, perceived ease of use, and perceived usefulness, The results confirmed that the FOMO bias has a notable impact on SME decision makers' choices when adopting new manufacturing technologies. This emotional factor goes beyond rational considerations based on functional attributes, potentially leading to premature or poorly justified technology investments. Also, decision makers' prior experience with the new technology can buffer the FOMO bias. Having this experience, managers are more likely to make informed decisions based on rational factors rather than emotional influences. Besides that, the study showed that when decision makers have high levels of FOMO, they tend to have stronger intentions to adopt novel manufacturing technology, even with similar evaluations of its usefulness and ease of use.

Another study confirmed the existence of FOMO on the organizational level. Shi, Wu, Pang, and Liu (2024) researched the effect of FOMO on managers' creativity. A total of 108 managers participated in the study. The research model had two types of stress as mediating variables for the relationship between managers' FOMO and their creativity. In the context of the study, Managers' creativity refers to the ability of individuals in leadership positions to generate novel and valuable ideas, solutions, and approaches in the context of their work-related tasks and responsibilities. The study highlighted the dynamic nature of managers' FOMO and its impact on creativity, indicating that managers' fear of missing out can either enhance creative performance through challenge stress or inhibit it through hindrance stress. The research explained the double-edged sword effect of managers' FOMO on their creativity, emphasizing that FOMO can have both positive and negative impacts on managers' creative abilities. Eventually, understanding the FOMO effect can lead to the development of a supportive organizational culture that helps leaders and managers deal with FOMO-related challenges more effectively.

More than that, Dinçer, Saygın, and Karadal (2022) in their review study confirmed that FOMO has influence within organizations. They concluded that FOMO can be found in the workplace among employees at all levels. Moreover, the Fear of Missing Out (FOMO) can impact managers and decision makers in several ways. It has the potential to influence employees' psychological preferences and behavior patterns in both the private and public sectors, as well as how supervisors manage. Also, FOMO is linked to an individual's productivity, work-life balance, work satisfaction, and their capacity to stay healthy. In addition to that, keeping in mind the status of today's business environment where technology is highly accessible. Researchers recommended that in order to manage the employees effectively, the fear of missing out should be handled carefully by managers. Furthermore, they emphasized the need for essential management resources and strategies to reduce personal anxiety and stress levels among employees.

In addition to that, Kyi (2020) studied the influence of FOMO on managers regarding their will to delegate their authority or not. The study was conducted with a sample size of 75 respondents using systematic random sampling and structured questionnaires. In this context it was found that FOMO can have a significant impact on delegation practices among individuals at managerial levels. Moreover, the study confirms that individuals experiencing higher levels of

anxiety and fear of missing out tend to delegate more of their responsibilities to subordinates. However, it is concluded that FOMO may hinder effective delegation practices, potentially impacting organizational performance. Eventually, it is concluded that creating a supportive and inclusive work environment helps in addressing the psychological impact of FOMO on employees and dealing with it.

On other stream, FOMO is widely discussed in marketing literature. Marketers utilize customers' FOMO to advertise and sell their goods or services. The new trend in marketing research and marketing strategy and planning is FOMO. Customers facing FOMO strategy tend to accept, adopt, or buy the advertised goods or services, more than customers who don't (Hodkinson, 2019). Keeping in mind that goods and services can be a new technology, while marketing blockchain technology to organizations, FOMO can be utilized to introduce and sell it to organizations. By highlighting the potential benefits and competitive advantages of adopting blockchain, marketers can encourage a sense of urgency and fear of missing out among decision-makers and managers at organizations. Emphasizing how blockchain can revolutionize business operations, enhance security, streamline processes, and even disrupt industries can create a perception of necessity and inevitability. And this eventually leads us to the same question, is blockchain adoption decision based on a real need or a fear?

2.5 Conceptual Research model

Based on the literature discussed in this chapter the conceptual research model was developed, figure 4 shows the conceptual model of the research. Model development will be discussed in greater detail in Chapter 3 of the dissertation.

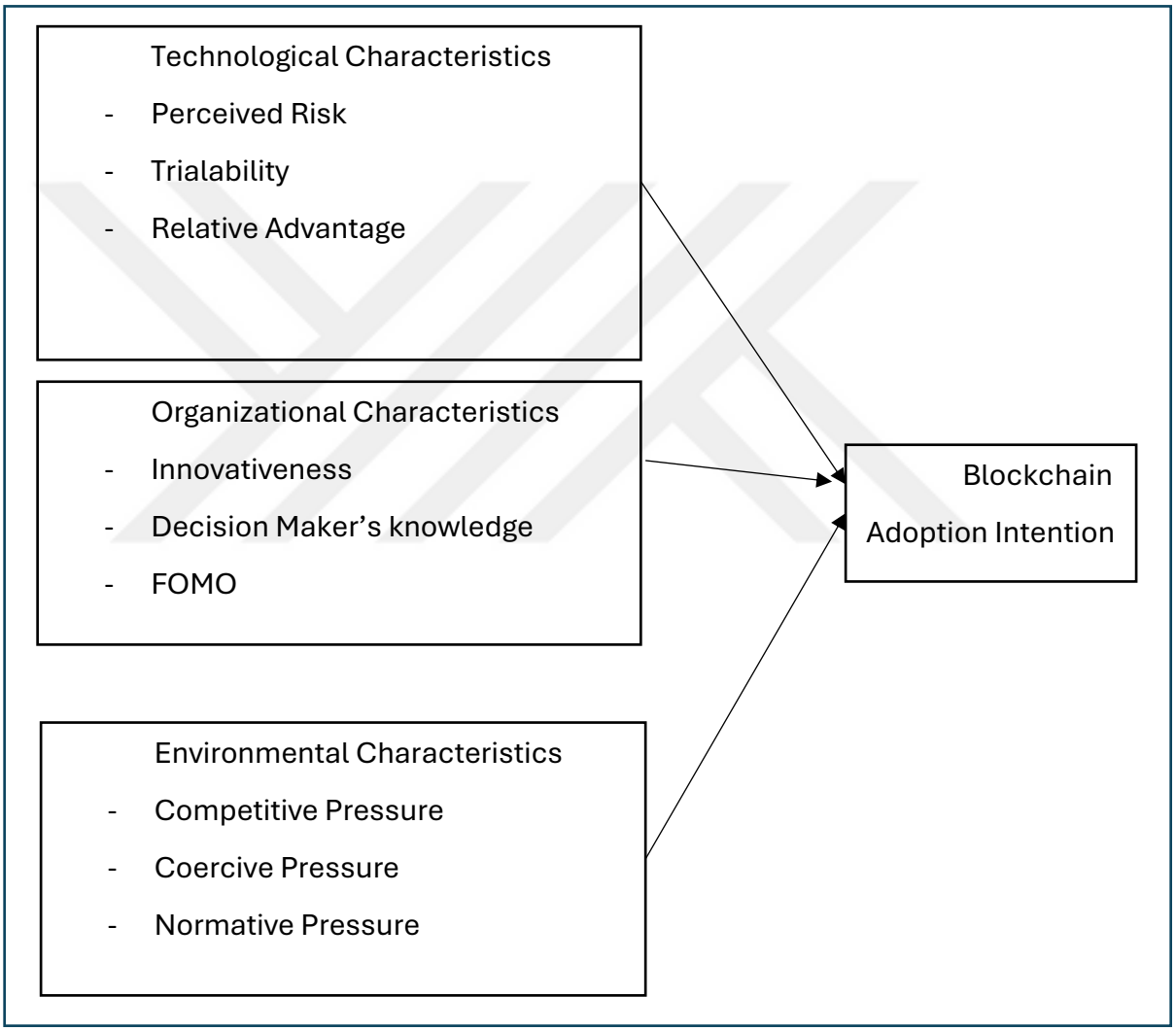

Figure 4 Conceptual Research Model

3 RESEARCH MODEL

This chapter is dedicated to explaining research model, research variables and research hypothesis. Basically, research models are based on the TOE model of technology adoption on the organizational level. As has been mentioned in chapter two of this dissertation, TOE model has three characteristics: Technological, Organizational, and Environmental characteristics. Independent variables of research models are different factors and each one of them corresponds to a different characteristic of TOE model. The following sections of this chapters show these variables along with its explanation and related hypothesis. The dependent variable is blockchain technology adoption intention in organizations. As discussed in the previous chapter, the combination of TOE and institutional theory has been applied in studies of new technology adoption (Li, 2008; Yoon & George, 2013). In this research the same combination will be employed. In addition to that, this research will extend the TOE model by adding a fourth dimension, which is human characteristics, to bridge the gap in the TOE model as explained by Li (2020).

In this chapter research hypotheses are going to be developed in order to develop model of the research. Later in this research, research model will be tested for the purpose of answering the following research questions:

RQ2: What are the factors that affect organizations' intention positively\negatively to adopt blockchain technology?

RQ3: What is the effect of FOMO on blockchain adoption intention in organizations?

3.1 Constructs and Hypothesis of Technological Characteristics

As discussed in chapter two, Technological characteristics represent a set of technologies available for the organization and can influence its productivity positively. Technological factors are factors that are related to the technology in inspection. In the case of blockchain technology adoption, we will include technological factors that are related to blockchain characteristics to

measure adoption factors more relatively. In addition, other critical technological factors in literature will be included.

3.1.1 Perceived Risk

Risk is associated with any action taken by an organization at the situation of lack of information, or in an unstable environment. Information technology adoption also implies risks at different levels, for example information privacy risk, economic risk, psychological risk, and performance risk. In the same way blockchain technology is associated with information privacy risk, and risk of not getting the expected benefit from the technology. In addition, at the literature perceived risk is concluded to have negative effect on technology adoption in organizations (Yoo, Bae, Park & Yang, 2018, Malik et al, 2021). Based on that, in this study perceived risk is defined as the perceived information privacy risk and adoption-benefit risk associated with the adoption of blockchain technology by an organization. And it is hypothesized that:

H1: Perceived risks associated with blockchain have a negative effect on the adoption of blockchain in organizations.

3.1.2 Trialability

Rogers (1995, p 251) defined trialability as "the degree to which an innovation may be experimented with on a limited basis". Offering organizations a chance to try the technological innovation before buying it will more likely allow organizations to consider adopting the technology. By doing so, the organization will have higher level of confidence in adoption decision and technology itself. Trialability has been recognized as a positively influencing factor on technology adoption decision in organizations (Banerjee, Wei & Ma, 2012). In this study Rogers's definition of trialability is adopted and based on that it is hypothesized that:

H2: Trialability of blockchain have a positive effect on the adoption of blockchain in organizations.

3.1.3 Relative Advantage

Relative advantage is defined as the benefit that the technological innovation offers to the organization, examples of benefits higher productivity, cost reduction, and time management

(Ghobakhloo et al, 2011; Siew et al, 2020). In the case of blockchain technology, it introduces many advantages such as better auditing, trust, and cost reduction (Malik et al, 2021). Relative advantage or perceived benefits is recognized in information technology research as a significant factor for technology adoption both on the individual and organizational level (Lutfi et al, 2016; Chandra & Kumar, 2018). Based on the previous discussion it is hypothesized that:

H3: Relative advantage of blockchain have a positive effect on the adoption of blockchain in organizations.

3.2 Constructs and Hypothesis of Organizational Characteristics

Since organizational characteristics represent different characteristics of organizations that helps the organization to accept the new technology such as organization size, structure, and human resources characteristics. In this research, within organizational context decision maker's knowledge, as well as FOMO are considered as dimensions of organizational characteristics because it is related to the decision-making managers in the organization.

3.2.1 Innovativeness

Rogers (2003, p 22) defined innovativeness as "*the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas than other members of a system*". Therefore, organizations that are open to change and frequently looking for possible developments in their products and services and looks for new technological solutions available in the environment are more likely to be more innovative (Ghobakhloo et al, 2011; Skafi et al, 2020). Recent study of blockchain adoption reported that higher levels of innovativeness results in higher technology adoption rates (Malik et al, 2021). Based on that, it can be hypothesized that:

H4: Organization's innovativeness has a positive effect on the adoption of blockchain in organizations.

3.2.2 Decision Maker's Knowledge

Knowledge of decision-maker is critical for decision making process. The amount and quality of available information for the decision maker plays a vital role in the quality of taken

decisions. Offering adequate information to decision-makers about the capabilities, advantages, applications, and costs of new technologies will level up their knowledge, therefore helping the take better adoption decision. In the literature of technology adoption, it has been recognized that decision-maker's knowledge -he/she can be a manger, a CEO, or a CIO- critically influences the adoption of technological innovation in an organization (Ghobakhloo et al, 2011; Chandra & Kumar, 2018). Based on that, it can be hypothesized that:

H5: Decision Maker's Knowledge has a positive effect on the adoption of blockchain in organizations.

3.2.3 Fear of Missing Out (FOMO)

-Direct effect of FOMO

In organizations, managers' individual characteristics, attitudes, beliefs, and behaviors have been recognized as influential factors on taken decisions. Psychological characteristics of decision makers also influence technology adoption decisions in organizations (Roberts & Flin, 2020). FOMO is defined as "*fear of missing an experience that can help the individual attain a personal and/or social goal, FOMO is a fear of missing an information or experience that can help the individual attain personal or social goals*" (Zhang, 2018 p 15, p 30). Zhang (2018) developed a context-free measure of FOMO to be easily adapted to any context. It has two components personal FOMO, and social FOMO. This measure will be adopted in this study, as will be explained later in chapter four. Based on the discussion in chapter 2 section 4, it can be concluded that FOMO might have a positive effect over the technology adoption intention. Based on that, it can be hypothesized that:

H6: Personal FOMO has a positive effect on the adoption of blockchain in organizations.

H7: Social FOMO has a positive effect on the adoption of blockchain in organizations.

-Moderating effect of FOMO

Previous studies in the literature concluded that FOMO in different contexts, showed a moderating effect. Liu, Liu, Yoganathan and Osburg (2021) concluded that FOMO moderated the

relationship between social media discontinuance intention and social media fatigue. In addition, Aljasir (2021) studied the moderating effect of FOMO on the relationship between life satisfaction and social media addiction, they found that FOMO moderated this relationship. In another study, FOMO was a significant moderator on the association between social media use and sleep between teenagers (Spaan, 2021).

In addition to that, moderators are usually used to present further explanations for the associations between dependent and independent variables. When a relationship holds frequently between the same variables at different contexts, a moderator explains and shows new reasons for this relationship. Based on that, among the variables in this study for example, the association between relative advantage and new technology adoption holds in different studies and contexts. This leads one to think of FOMO as a possible moderator, it may explain these associations, and it may present new insights of the factors that may be leading decision makers in organizations to adopt new technologies. Based on the previous discussion, it can be hypothesized that:

- Personal FOMO

H6a: Personal FOMO moderates the relationship between perceived risk and organization's blockchain adoption intention.
H6b: Personal FOMO moderates the relationship between trialability and organization's blockchain adoption intention.
H6c: Personal FOMO moderates the relationship between relative advantage and organization's blockchain adoption intention.
H6d: Personal FOMO moderates the relationship between innovativeness and organization's blockchain adoption intention.
H6e: Personal FOMO moderates the relationship between decision maker's knowledge and organization's blockchain adoption intention.
H6f: Personal FOMO moderates the relationship between competitive pressure and organization's blockchain adoption intention.
H6g: Personal FOMO moderates the relationship between coercive pressure and organization's blockchain adoption intention.

H6h: Personal FOMO moderates the relationship between normative pressure and organization's blockchain adoption intention.

- Social FOMO

H7a: Social FOMO moderates the relationship between perceived risk and organization's blockchain adoption intention.

H7b: Social FOMO moderates the relationship between trialability and organization's blockchain adoption intention.

H7c: Social FOMO moderates the relationship between relative advantage and organization's blockchain adoption intention.

H7d: Social FOMO moderates the relationship between innovativeness and organization's blockchain adoption intention.

H7e: Social FOMO moderates the relationship between decision maker's knowledge and organization's blockchain adoption intention.

H7f: Social FOMO moderates the relationship between competitive pressure and organization's blockchain adoption intention.

H7g: Social FOMO moderates the relationship between coercive pressure and organization's blockchain adoption intention.

H7h: Social FOMO moderates the relationship between normative pressure and organization's blockchain adoption intention.

3.3 Constructs and Hypothesis of Environmental Characteristics

Environmental characteristics implies the place and context where an organization conduct its business, its competitors, and interactions with the government. Environmental context has dimensions from institutional theory because institutional theory best explains the role of the environment and the pressures on the organization. Institutional theory is used widely in the literature to explain the motives behind technology adoption in organizations. Three institutional pressures are included in the model.

3.3.1 Mimetic (Competitive) Pressures

Mimetic powers are defined as the power or pressure that results from the belief that what competitors at the same environment are doing is beneficial. Mimetic pressures lead organizations to imitate each other which results in similar organizational structures and norms (DiMaggio & Powell, 1983). In the context of technology adoption, deciding to adopt a new technology has a risky side, so organizations tend to follow or imitate a leading competitor at the same environment in adopting or not adopting an emerging technology (Soares, Mendes-Fillo & Gretzel, 2020).

Moreover, organizations strategically plan to create their own competitive advantage and to keep their competitive position. Organizations don't prefer to stay behind in the competitive race, due to that organizations mimic and benchmark leading competitors in the industry and their competitive practices. Adopting the same technology between competitors is one of these practices. Additionally, in the literature of technology adoption, mimetic pressures have been recognized as a significant predictor of technology adoption in organization (Gupta et al, 2020). Based on that, it can be hypothesized that:

H8: Competitive pressures have a positive effect on the adoption of blockchain in organizations.

3.3.2 Coercive Pressures

Coercive Powers cause organizations to change due to a pressure from another organization which might be dependent on partners, or by government (DiMaggio & Powell, 1983). This type of pressures in the context of technology adoption leads organizations to adopt some type of technology in provision for conforming to government rules or to be able to interoperate with other partner organizations working together (Soares, Mendes-Fillo & Gretzel, 2020). Previous studies concluded that coercive pressures affect organization's technology adoption decision (Gupta et al, 2020). In the case of blockchain coercive pressures might lead organizations to adopt this technology, as a way to be able to work and incorporate with partners. Based on that, it can be hypothesized that:

H9: Coercive pressures have a positive effect on the adoption of blockchain in organizations.

3.3.3 Normative Pressures

Normative powers is defined as pressures that is caused by norms and standers in the institutional environment that each organization in that context should follow that they may be legitimized and able to operate in the environment (DiMaggio & Powell, 1983). In the context of technology adoption organizations should adopt some technologies and norms stated by trade associations or certification programs for example (Soares, Mendes-Fillo & Gretzel, 2020). A study on the adoption of industry 4.0 technology highlighted normative pressure includes pressures from customers, government, and professional bodies to adopt the technology (Gupta et al, 2020). Based on this discussion, it can be hypothesized that:

H10: Normative pressures have a positive effect on the adoption of blockchain in organizations.

3.4 Blockchain Adoption Intention and Blockchain Use

As discussed in chapter two, in this study technology adoption is defined as the decision taken by organizations to invest in acquiring a new technology and applying it in different business functionalities for achieving its goals. In this research the technology under investigation is blockchain technology. Moreover, in Technology Acceptance Model and in the Unified Theory of Acceptance and Use of Technology, actual system use was investigated all together with technology adoption. The actual system use is defined as the actual utilization and use of the system occurs at the point where individuals interact with the technology (Nguyen, Nguyen, & Cao, 2014). According to Technology acceptance model, Behavioral intention is a determinant that drives individuals to actually use the technology (Venkatesh & Davis, 2000; Zhu & Zhang, 2022). In this research behavioral intention corresponds to Blockchain Adoption Intention. Based on this discussion, it can be hypothesized that:

H11: Blockchain Adoption Intention has a positive effect on the actual Blockchain Use.

- Mediation Effect of Blockchain Adoption Intention

H12: Blockchain Adoption Intention mediates the relationship between Perceived Risk and Blockchain Use.

H13: Blockchain Adoption Intention mediates the relationship between Trialability and Blockchain Use.

H14: Blockchain Adoption Intention mediates the relationship between Relative Advantage and Blockchain Use.

H15: Blockchain Adoption Intention mediates the relationship between Innovativeness and Blockchain Use.

H16: Blockchain Adoption Intention mediates the relationship between Decision Maker's Knowledge and Blockchain Use.

H17: Blockchain Adoption Intention mediates the relationship between Personal FOMO and Blockchain Use.

H18: Blockchain Adoption Intention mediates the relationship between Social FOMO and Blockchain Use.

H19: Blockchain Adoption Intention mediates the relationship between Competitive Pressures and Blockchain Use.

H20: Blockchain Adoption Intention mediates the relationship between Coercive Pressures and Blockchain Use.

H21: Blockchain Adoption Intention mediates the relationship between Normative Pressures and Blockchain Use.

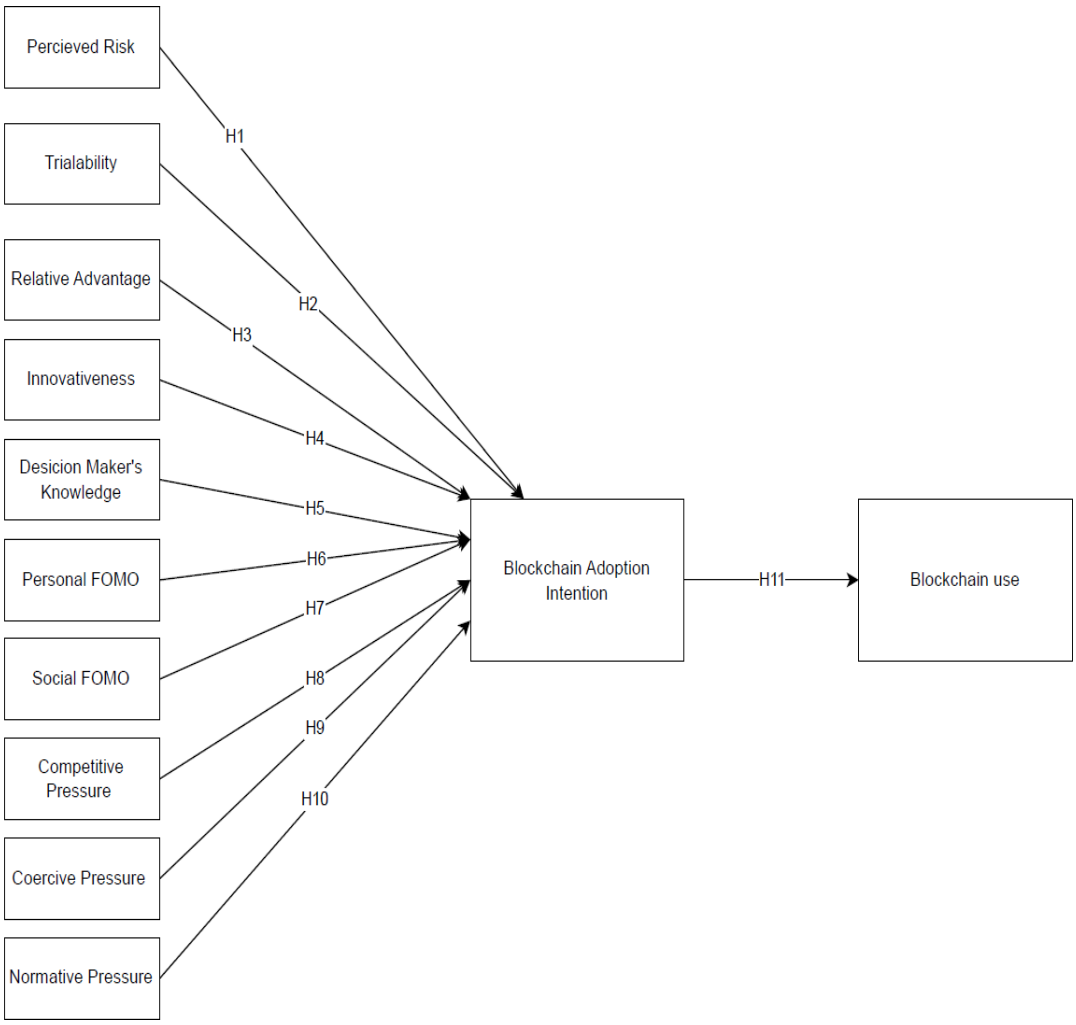

Figure 5 Research Model

Based on the discussion of constructs and research hypothesis the research model was developed, as shown in figure 5.

3.5 Summary of Research Hypothesis

Table 3 Research Hypothesis (Direct Effect)

Hypothesis number	Hypothesis statement
H1	Perceived risks associated with blockchain have a negative effect on the adoption of blockchain in organizations.
H2	Trialability of blockchain have a positive effect on the adoption of blockchain in organizations.
H3	Relative advantage of blockchain have a positive effect on the adoption of blockchain in organizations.
H4	Organization's innovativeness has a positive effect on the adoption of blockchain in organizations.
H5	Decision Maker's Knowledge has a positive effect on the adoption of blockchain in organizations.
H6	Personal FOMO has a positive effect on the adoption of blockchain in organizations
H7	Social FOMO has a positive effect on the adoption of blockchain in organizations.
H8	Competitive pressures have a positive effect on the adoption of blockchain in organizations.
H9	Coercive pressures have a positive effect on the adoption of blockchain in organizations.
H10	Normative pressures have a positive effect on the adoption of blockchain in organizations.
H11	Blockchain Adoption Intention has a positive effect on the actual Blockchain Use.

Table 4 Research Hypothesis (Mediation Effect)

Hypothesis number	Hypothesis statement
H12	Blockchain Adoption Intention mediates the relationship between Perceived Risk and Blockchain Use.
H13	Blockchain Adoption Intention mediates the relationship between Trialability and Blockchain Use.
H14	Blockchain Adoption Intention mediates the relationship between Relative Advantage and Blockchain Use.
H15	Blockchain Adoption Intention mediates the relationship between Innovativeness and Blockchain Use.
H16	Blockchain Adoption Intention mediates the relationship between Decision Maker's Knowledge and Blockchain Use.
H17	Blockchain Adoption Intention mediates the relationship between Personal FOMO and Blockchain Use.
H18	Blockchain Adoption Intention mediates the relationship between Social FOMO and Blockchain Use.
H19	Blockchain Adoption Intention mediates the relationship between Competitive Pressures and Blockchain Use.
H20	Blockchain Adoption Intention mediates the relationship between Coercive Pressures and Blockchain Use.
H21	Blockchain Adoption Intention mediates the relationship between Normative Pressures and Blockchain Use.

Table 5 Research Hypothesis (Moderation Effect)

Hypothesis number	Hypothesis statement
H6a	Personal FOMO moderates the relationship between perceived risk and organization's blockchain adoption intention.
H6b	Personal FOMO moderates the relationship between trialability and organization's blockchain adoption intention.
H6c	Personal FOMO moderates the relationship between relative advantage and organization's blockchain adoption intention.
H6d	Personal FOMO moderates the relationship between innovativeness and organization's blockchain adoption intention.
H6e	Personal FOMO moderates the relationship between decision maker's knowledge and organization's blockchain adoption intention.
H6f	Personal FOMO moderates the relationship between competitive pressure and organization's blockchain adoption intention.
H6g	Personal FOMO moderates the relationship between coercive pressure and organization's blockchain adoption intention.
H6h	Personal FOMO moderates the relationship between normative pressure and organization's blockchain adoption intention.
H7a	Social FOMO moderates the relationship between perceived risk and organization's blockchain adoption intention.
H7b	Social FOMO moderates the relationship between trialability and organization's blockchain adoption intention.
H7c	Social FOMO moderates the relationship between relative advantage and organization's blockchain adoption intention.
H7d	Social FOMO moderates the relationship between innovativeness and organization's blockchain adoption intention.
H7e	Social FOMO moderates the relationship between decision maker's knowledge and organization's blockchain adoption intention.
H7f	Social FOMO moderates the relationship between competitive pressure and organization's blockchain adoption intention.
H7g	Social FOMO moderates the relationship between coercive pressure and organization's blockchain adoption intention.
H7h	Social FOMO moderates the relationship between normative pressure and organization's blockchain adoption intention.

4 METHODOLOGY

This chapter is dedicated for explaining the research methodology that is used in this research, and for exploring the status of blockchain technology in Turkey. The type of the research, data collection methods, characteristics of the sample and unit of analysis will also be clarified. Besides that, instrument development will also be explained.

4.1 Blockchain in Turkey

This section is intended to explore blockchain technology's status in Turkey to gain a better understanding of the environment where the study is planned to be conducted. Blockchain technology is relatively new technology, adoption rates around the world are increasing day by day. Its applications are still mature and developing. A like, blockchain technology and applications in Turkey have the same situation.

Additionally, Erol, Ar, Ozdemir, Peker, Asgary, Medeni and Medeni (2020) quantitively studied the feasibility of blockchain technology for different industries in Turkey. They found that logistics and supply chain, health and finance industries have the highest feasibility rates of blockchain technology. Also, the study was based on 15 indicators to assess the feasibility of blockchain in 7 different industries in Turkey. This study indicates that these three industries are the most attractive industries for further studies in blockchain field in Turkey. Based on that, this research will collect data from the finance industry.

More than that, Takaoğlu (2019) reported application areas of blockchain technology in Turkey. These areas included: banking, internet security, supply chain, internet of things, insurance, private and public transportation, online data inventories, voting, donations, e-government, healthcare, copyright, energy management, real estate, digital identity, smart cities, smart contracts, and education. On the same stream, Baygin, Baygin, and Karakose (2019) asserted that governance, finance, technology, supply chain, and education are the sectors that will benefit from blockchain technology the most in Turkey.

Finally, at the end of this section it is beneficial to address Network Readiness Index of Turkey (NRI, 2022). This index is annually published by Portulans Institute -previously it was published by world economic forum- to evaluate the readiness of countries around the world to implement different technologies, and benefit from information and communication technologies. Turkey was ranked 45 among 113 countries in the overall index. And ranked 58 in adopting emerging technologies, with 49.37 score (NRI, 2022).

4.2 Research Approach

Basically, in an effort to expand understanding of blockchain technology adoption in organizations, basic research will be conducted (Sekaran & Bougie, 2016). Basic research is commonly applied for the purpose of getting a wider and better understanding of a certain subject (Sekaran & Bougie, 2016), which is organizational blockchain technology adoption intention in this research.

Back to research questions:

RQ1: What are the factors of blockchain technology adoption intention in organizations?

RQ2: What are the factors that affect organizations' intention positively\negatively to adopt blockchain technology?

RQ3: What is the effect of FOMO on blockchain adoption intention in organizations?

First of all, to answer RQ1 a thorough literature review has been done. Also, by doing that, factors mentioned in the literature along with the assumptions of TOE and institutional theory, a research model have been developed for conducting quantitative research for testing it and to answer RQ2. Answering RQ3 will be achieved by including FOMO in the research model, and then further analysis of FOMO results will be done.

Based on that, a positivist quantitative research approach is going to be applied in this research. Determining factors affecting intention to adopt blockchain technology in organizations requires a quantitative model to measure the relationship between each of the factors concluded from the literature, and the dependent variable of the research. Data to be used in this research will

be a primary and quantitative data (Howell, 2013), hence the data will be collected by surveying private sector organizations in Turkey. In addition, a questionnaire-survey approach is going to be used in order to collect data for this research. For the purpose of surveying larger number of organizations and enhancing the reach to different organizations, online surveys are going to be used by emailing them. The collected data will be descriptive not experimental because it will be gathered without controlling any variable. Nonexperimental settings are recommended when the researcher doesn't need to alter the situation, conditions, or the participating sample (Hood-Clark, 2016).

Generally, unit of analysis is the item that research finding is going to be about. While unit of observation is the item that is going to be actually observed (Sedgwick, 2014). Specifically, the unit of analysis of this research is private Turkish organizations that are running their business in finance sector. This sector was chosen based on the study of Erol et. al (2020), where their research concluded three sectors are the most feasible sectors for blockchain adoption in Turkey. In addition, the unit of observation is managers who are responsible for taking decisions regarding new technology adoption and employment in these organizations.

Time scale of data collection will be cross sectional; data will be collected at a single point of time. The research context doesn't necessitate collecting data at different points of time, time is not an affecting variable to the context (Sekaran & Bougie, 2016). Also, data collection location will be the field -not the lab- because data will be collected from organizations in their natural setting. In this research there is no need for measuring the effect of any controlling condition (Leedy & Ormrod, 2015). Finally, collected data will be treated and analyzed by applying statical analyzing techniques (Sekaran & Bougie, 2016). According to the research model SPSS / AMOS structural equation modeling software will be used for conducting the analysis.

4.3 Sample

Sampling will be probability sampling because this research aims at generalizing the findings (Palinkas et al, 2015). The target sample in this research is going to include adopter and potential adopter organizations, because blockchain technology is in its early stages of spread and its adoption rates are limited. In the literature of new technology adoption, limited number of

constraints were imposed on choosing target sample. In the case of cloud computing adoption for example, due to the limited spread of the technology and limited available applications, studies were targeted to all types of private sector organizations (Borgman, Bahli, Heier & Schewski, 2013; Gangwar, Date & Ramaswamy, 2015; Gangwar & Date, 2016). In this dissertation, the sample will be chosen from the finance industry based on the study of Erol et. al (2020), where their research concluded that financial industry is among the most feasible three industries for blockchain adoption in Turkey.

Many studies in the area of technology adoption surveyed a random sample of organizations. The recommended resource of candidate organizations to be surveyed was Chamber of Commerce (Gangwar, Date & Ramaswamy, 2015; Gangwar & Date, 2016). Based on that, in this research a random sample of organizations will be selected from the lists of organizations registered in the chamber of commerce that is operating in finance industry. Besides that, in the literature the studies of technology adoption on the organizational level have surveyed managers with decision making authority (Malik et al, 2021; Baral et al, 2023). Likewise, in this research managers with decision making authority and experience will be surveyed.

4.4 Measures and Instrument

Since the variables in the research model have been identified from the literature, measures will also be adopted from studies in the literature that have used these measures successfully. Adopting previously used and tested measures will positively reflect the reliability and validity of the research and increase them. At this stage face validity and content validity of the measures is critical because they ensure reliable results from the research. Content validity is defined as "*Establishes the representative sampling of a whole set of items that measures a concept and reflects how well the dimensions and elements thereof are delineated*." (Sekaran, 2009 pp.415). Where face validity is defined as "*An aspect of validity examining whether the item on the scale, on the face of it, reads as if it indeed measures that it is supposed to measure*" (Sekaran, 2009 pp.417).

A five-point Likert scale (Strongly Disagree = 1 and Strongly Agree = 5) is going to be used for measuring the items in the questionnaire. Using this type of scale allows the respondent

to express the degree of her/his agreement with each statement of the measurement items. These types of scales are used in research whenever the researcher is interested in measuring the respondents' attitudes and perceptions toward a particular topic (Sekaran, 2009).

More than that, in designing the instrument, screening questions about organizations' awareness of blockchain technology will be added to ensure their understanding of the technology and their familiarity with the technology. Also, questions about the industry and the firm size, to help in profiling the sample later in the analysis stage. Since the study is going to be done in Turkey, the instrument should be translated to Turkish language and then consult professors and experts in the field, to ensure the clarity and understandability of the translated questions.

The remaining sections of this chapter explain the measuring items for all the variables in the research model. These measures are adopted from the literature. The wording of items has been adapted and changed to fit the blockchain technology context.

4.4.1 Measures of Technological Characteristics

Perceived Risk

Technology adoption is associated with different types of risks at different levels in organizations. In the context of blockchain technology, information's privacy is a high concern for adopters. Also, in relation to adopting new technologies, not gaining expected benefits from this technology is always a concern for adopters. These two types of risks were addressed in the context of blockchain adoption by Malik et al (2021). Their measure of risk included three items as follows:

1- Transactions' information will be compromised while using blockchain technology.
2- Blockchain technology will not provide its expected benefits
3- Blockchain is not secured

In this research, the same measure is going to be adopted due to the similarity of the study context and theory.

Trialability

Offering organizations the chance to try the technological innovation before buying it, more likely allows organizations to consider adopting the technology. Also, trialability implies offering free trial version of the technology application. Besides that, offering organizations enough time to try the technology before adopting it, and offering an easy exit is important. This variable has been measured in studying different technologies adoption. Maroufkhani et al (2020) measured trialability in big data technology context within TOE model using 5 items as follows:

1- My organization could access a free trial blockchain application before deciding to adopt Blockchain technology.
2- My organization has the opportunity to try a number of blockchain applications before making a decision and try it out on a sufficiently large scale.
3- My organization is allowed to use blockchain technology on a trial basis long enough to see its true capabilities.
4- It is easy to get out after testing a blockchain package.
5- The start-up cost for using blockchain technology is low.

In this research, the same measure is going to be adopted due to the similarity of the study context and theory.

Relative Advantage

Advantage refers to the benefits that an organization may gain by adopting a certain technology. Relative advantage reflects the benefits of blockchain technology to the organization in terms of increased efficiency. In this research, a measure of relative advantage will be adopted from the research of Setiyani and Rostiani (2021), due to the similarity of the theoretical settings of their research and this research. They studied E-Commerce adoption in small and medium sized organizations in Indonesia by applying TOE model. Their measure included four items; they were adapted to the context of our research as follows:

1- The use of blockchain increases the efficiency of time in service to customers at my organization.
2- The use of blockchain increases the efficiency of operational costs at my organization.

3- The use of blockchain increases the efficiency of human resources at my organization
4- The use of blockchain reduces overhead expenses at my organization.

4.4.2 Measures of Organizational Characteristics

Innovativeness

Innovativeness is a trait of organizations that: are open to change and frequently looking for new ways to solve problems, take the risk of doing business differently, and looks for new technological solutions available in the environment, (Ghobakhloo et al, 2011; Malik et al, 2021). Innovativeness has been studied in the context of technology adoption widely. In this research measure of innovativeness will be adopted from the research of Ghobakhloo et al (2011), due to the similarity of the theoretical settings of their research and this research. They studied E-Commerce adoption in small and medium sized organizations by applying TOE model. Their measure included four items; the items were adapted to the context of this research as follows:

1- Organizations adopt blockchain when they have original ideas
2- Organizations adopt blockchain when they would sooner create something new than improve something existing
3- Organizations adopt blockchain when they often risk doing things differently
4- Organizations adopt blockchain when they often have fresh perspective on old problems

Decision Maker's Knowledge

Knowledge and awareness of decision makers in organizations of recent technological developments and technological applications in business influences the status of their organization. Knowledge of managers with decision making authority in organizations are in our interest in this research. Decision maker's knowledge has been studied in the context of technology adoption widely. In this research the measure of this concept will be adopted from the research of Ghobakhloo et al (2011), due to the similarity of the theoretical settings of their research and this research. They studied E-Commerce adoption in small and medium sized organizations by applying TOE model. Their measure included three items, the items were adapted to the context of this research as follows:

1- I would rate my own blockchain knowledge as very good compared to other people in similar positions

2- Regarding my understanding of IS, I know the effects of adopting blockchain technology application over my organization

3- I have a good level of blockchain experience

Fear Of Missing Out (FOMO)

Psychological characteristics of decision makers also influence technology adoption decisions in organizations (Roberts & Flin, 2020). FOMO is one of these psychological characteristics **.** Zhang (2018) developed a context-free measure of FOMO to be easily adapted to any context. It has two components with a total number of nine items. We adapted these items to the context of blockchain adoption as follows:

Personal FOMO

1. I feel anxious when I do not experience new blockchain technology

2. I believe I am falling behind compared with other competitors when I miss adopting new blockchain technology

3. I feel anxious because I know something important, or fun must happen when I miss adopting new blockchain technology opportunity

4. I feel sad if I am not capable of adopting new blockchain technology due to constraints of other things

5. I feel regretful of missing the chance of adopting new blockchain technology.

Social FOMO

6. I think my competitors and partners view my organization as unimportant when we don't adopt new blockchain technology

7. I think my organization do not fit in the environment when we don't adopt new blockchain technology

8. I think my organization is excluded by competitors\partners when we miss the chance to adopt new blockchain technology

9. I feel that my organization is ignored or forgotten by competitors\partners when we miss the chance to adopt new blockchain technology

4.4.3 Measures of Environmental Characteristics

Competitive Pressure

Competitive pressures are results from the power or pressure that come from the belief that what competitors at the same environment are doing is beneficial. In the context of technology adoption, deciding to adopt a new technology has a risky side, so organizations tend to follow or imitate a leading competitor at the same environment in adopting or not adopting an emerging technology (Soares, Mendes-Fillo & Gretzel, 2020). In this research, a measure of innovativeness will be adopted from the research of Siew et al (2020), due to the similarity of the theoretical settings of their research and this research. They studied audits computer application adoption in audit firms, by employing TOE model as the underlying model of their research. Their measure included three items; the items were adapted to the context of this research as follows:

1- Our firm experience competitive pressure to implement blockchain technology
2- Our firm would have experienced a competitive disadvantage if blockchain technology had not been adopted
3- Our firm's competitors have adopted blockchain technology to a high extent

Coercive Pressure

Coercive Pressures cause organizations to change due to a pressure from another organization which might be dependent on partners, or by government (DiMaggio & Powell, 1983). This type of pressures in the context of technology adoption leads organizations to adopt some type of technology in provision for conforming to government rules or to be able to interoperate with other partner organizations working together (Soares, Mendes-Fillo & Gretzel, 2020). In their study, Gupta et al (2020) adopted a three itemed measure to measure coercive pressures in the context of industry 4.0 and supply chain technology adoption intention. The same measure will be used in this study, the measure has been adapted to blockchain context as following:

1- State government requires our organization to adopt blockchain technology

2- The industry association requires our organization to adopt blockchain technology
3- The customers of our organization require our organization to adopt blockchain technology

Normative Pressure

In the context of technology adoption organizations should adopt some technologies and norms stated by trade associations, certification programs, suppliers or customers (Soares, Mendes-Fillo & Gretzel, 2020). A study on the adoption of industry 4.0 technology highlighted normative pressure includes pressures from customers, government, and professional bodies to adopt the technology (Gupta et al, 2020). In their study they adopted three itemed measures for measuring normative pressures in the context of industry 4.0 and supply chain technology adoption intention. The same measure will be used in this study, the measure has been adapted to blockchain context as following:

1-The extent to which your organization's customers have adopted blockchain technology
2-The extent to which supplier of your organizations have adopted blockchain technology
3-The extent to which professional bodies promotion of blockchain has influenced your organization to adopt blockchain technology

4.4.4 Measures of Blockchain Adoption Intention

Technology adoption intention or technology adoption shortly, has been subject of interest for many researchers in the field of technology and other fields (Shukla, & Shankar, 2022). Many theories and models were employed to study it both on the organizational and individual level. In our research we are studying it on the organizational level using TOE model. It is the analytical base in organizational technology adoption research. TOE, Wei and Benbasat (2003) used the following measure for technology adoption intention. The following three items are adapted to fit the blockchain technology context:

1- My organization is considering adopting blockchain technology in the future.
2- My organization is likely to adopt blockchain technology in the future.
3- My organization will adopt blockchain technology when they have access to it in the future.

4.4.5 Measures of Blockchain Use

A study on the adoption of cloud computing-based E-learning system, highlighted that actual system use is the actual utilization and use of the system occurs at the point where individuals interact with the technology (Nguyen, Nguyen, & Cao, 2014). In their study they adopted two itemed measures for measuring technology use in the context of cloud computing and e-learning technology adoption intention. The same measure will be used in this study, the measure has been adapted to blockchain context as following:

1- Blockchain technology is currently used in my organization
2- Blockchain technology is frequently used in my organization

4.5 Summary of survey items

Table 6 Summary Of Survey Items With Codes

Factors	Measuring items
Perceived Risk (RS)	-RS1 Transactions' information will be compromised while using blockchain technology. -RS2 Blockchain technology will not provide its expected benefits - RS3 Blockchain is not secured
Trialability (TR)	-TR1 My organization could access to a free trial blockchain application before deciding to adopt Blockchain technology. -TR2 My organization has the opportunity to try a number of blockchain applications before making a decision and try it out on a sufficiently large scale. -TR3 My organization is allowed to use blockchain technology on a trial basis long enough to see its true capabilities. -TR4 It is easy to get out after testing a blockchain package. -TR5 The start-up cost for using blockchain technology is low.
Relative Advantage (RA)	-RA1 The use of blockchain increases the efficiency of time in service to customers at my organization. -RA2 The use of blockchain increases the efficiency of operational costs at my organization. -RA3 The use of blockchain increases the efficiency of human resources at my organization -RA4 The use of blockchain reduces overhead expenses at my organization.
Innovativeness (INV)	In my opinion, organizations adopt blockchain when: -INV1 They have original ideas -INV2 They would sooner create something new than improve something existing -INV3 They often risk doing things differently -INV4 They often have fresh perspective on old problems
Decision Maker's knowledge (DMK)	-DMK1 I would rate my own blockchain knowledge as very good compared to other people in similar positions -DMK2 Regarding my understanding of IS, I know the effects of adopting blockchain technology application over my organization -DMK3 I have a good level of blockchain experience
Personal Fear Of Missing Out (FO)	-FO1 I feel anxious when I do not experience new blockchain technology -FO2 I believe I am falling behind compared with other competitors when I miss adopting new blockchain technology -FO3 I feel anxious because I know something important or fun must happen when I miss adopting new blockchain technology opportunity

	-FO4 I feel sad if I am not capable of adopting new blockchain technology due to constraints of other things -FO5 I feel regretful of missing the chance of adopting new blockchain technology.
Social Fear Of Missing Out (sFO)	-sFO6 I think my competitors and partners view my organization as unimportant when we don't adopt new blockchain technology -sFO7 I think my organization do not fit in the environment when we don't adopt new blockchain technology -sFO8 I think my organization is excluded by competitors\partners when we miss the chance to adopt new blockchain technology -sFO9 I feel that my organization is ignored or forgotten by competitors\partners when we miss the chance to adopt new blockchain technology
Competitive Pressure (CVP)	CVP1. Our firm experience competitive pressure to implement blockchain technology CVP2. Our firm would have experienced a competitive disadvantage if blockchain technology had not been adopted CVP3. Our firm's competitors have adopted blockchain technology to a high extent
Coercive Pressure (CP)	- CP1 State government requires our organization to adopt blockchain technology - CP2 The industry association requires our organization to adopt blockchain technology - CP3 The customers of our organization require our organization to adopt blockchain technology
Normative Pressure (NP)	-NP1 The extent to which your organization's customers have adopted blockchain technology -NP2 The extent to which supplier of your organizations have adopted blockchain technology -NP3 The extent to which professional bodies promotion of blockchain has influenced your organization to adopt blockchain technology
Blockchain adoption intention (INT)	-INT1 My organization is considering adopting blockchain technology in the future. -INT2 My organization is likely to adopt blockchain technology in the future. -INT3 My organization will adopt blockchain technology when they have access to it in the future.
Blockchain use (BU)	- BU1: Blockchain technology is currently used in my organization -BU2: Blockchain technology is frequently used in my organization

5 DATA ANALYSIS

This chapter is dedicated to data analysis. In order to reach the research results, several analytical tests will be conducted. During the data collection stage, out of 500 surveys sent, only 228 surveys were completed by managers at different organizational levels, on the internet using Google Forms. These managers spanned different levels of the organizational hierarchy, ensuring a diverse range of perspectives. The survey process was designed to gather comprehensive data on various aspects relevant to the study. To ensure the quality and relevance of the data, screening questions were considered. As a result, a total of 211 surveys were found eligible for analysis.

The data collected between the dates 6th of March 2024 and 28th of April 2024. The resulting dataset of 211 eligible surveys provides a solid foundation for subsequent analysis, offering insights derived from the experiences and perspectives of managers at different organizational levels over nearly two months of data collection. In this chapter descriptive statistics, exploratory factor analysis EFA, confirmatory factor analysis CFA, structural equation modelling SEM, mediation, and moderation analytical tests will be done. Afterward, hypotheses results will be presented. Both IBM SPSS Statistics 23 and AMOS Graphics 23 are used for the analysis.

5.1 Descriptive Statistics

In this section, the demographic statistics will be presented, covering the distribution frequencies of gender, education level, organization type, work experience, organization size, managerial levels, sector types, and participation in decision making process. Moreover, mean and standard deviation of each variable in the research model will be presented.

5.1.1 Gender Distribution

The total number of respondents in the sample of the study is 211. As can be seen from the following table, the majority of respondents are males. The gender distribution of the study is 59.7% males and 40.3% females with frequencies of 126 and 85 respectively. More details are shown in the following figure and table.

Table 7 Gender

Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	85	40.3	40.3	40.3
	Male	126	59.7	59.7	100
	Total	211	100	100	

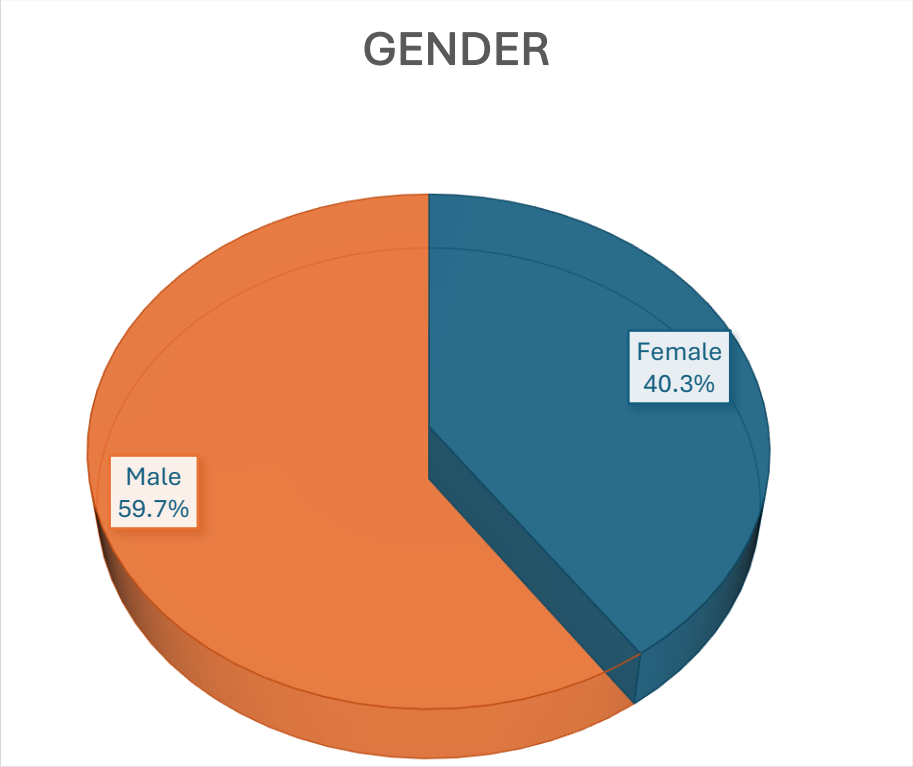

Figure 6 Pie Chart of Gender

5.1.2 Education Level Distribution

The participants were asked about their educational level. As can be seen from the following table, the majority of respondents have a bachelor's degree. Less number of respondents hold graduate degrees (PhD and Masters). More details are shown in the following figure and table.

Table 8 Education levels

Education					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Associate	45	21.3	21.3	21.3
	Bachelor	129	61.1	61.1	82.5
	High School	15	7.1	7.1	89.6
	Masters	22	10.4	10.4	100
	PhD	0	0	0	100
	Total	211	100	100	

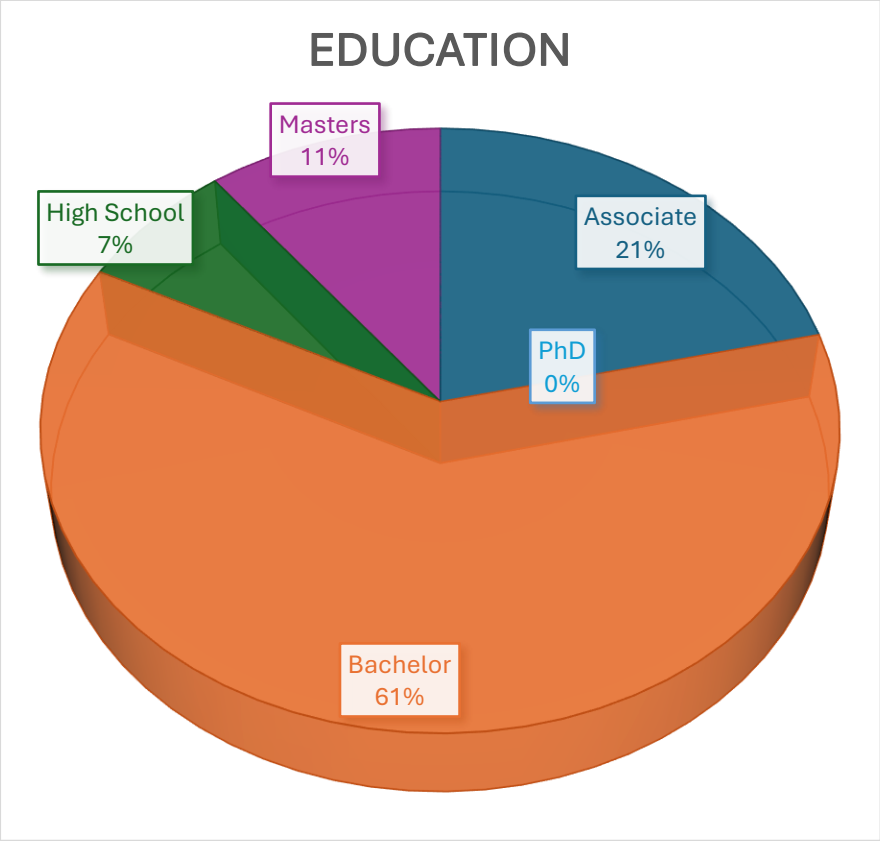

Figure 7 Pie Chart of Education levels

5.1.3 Organization Type Distribution

As can be seen from the following table and figure, in the sample the respondents are working in private organizations. This result meets the goal of the research. The goal of this research is to test the model in private not public sector organizations.

Table 9 Organization Type

Organization Type					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Private	211	100	100	100
	Public	0	0	0	100

Figure 8 Pie Chart of Organization Type

5.1.4 Work Experience Distribution

The participants were asked to fill out their work experience in years. After that, the data of years of experience were categorized into four categories according to Tella, Ayeni, and Popoola (2007)'s categorization. As can be seen from the following table, the majority of respondents have 6-10 years of work experience. More details are shown in the following figure and table.

Table 10 Work Experience

Experience					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0-5 Years	70	33.2	33.2	33.2
	6-10 Years	80	37.9	37.9	71.1
	11-20 Years	58	27.5	27.5	98.6
	21-30 Years	3	1.4	1.4	100
	Total	211	100	100	

Figure 9 Pie Chart of Work Experience

5.1.5 Number of Employees Distribution

The Organization for Economic Co-operation and Development (OECD, 2024), categorizes organizations according to their number of employees into micro enterprises (1-9 employees), small enterprises (10-49 employees), medium enterprises (50-249 employees), and large enterprises (more than 49 employees). The majority of the sample are medium enterprises with 55%. More details are shown in the following figure and table.

Table 11 Organization Size

Organization size					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Small Enterprises	8	3.8	3.8	3.8
	Medium Enterprises	116	55.0	55.0	58.8
	Large Enterprises	87	41.2	41.2	100
	Total	211	100	100	

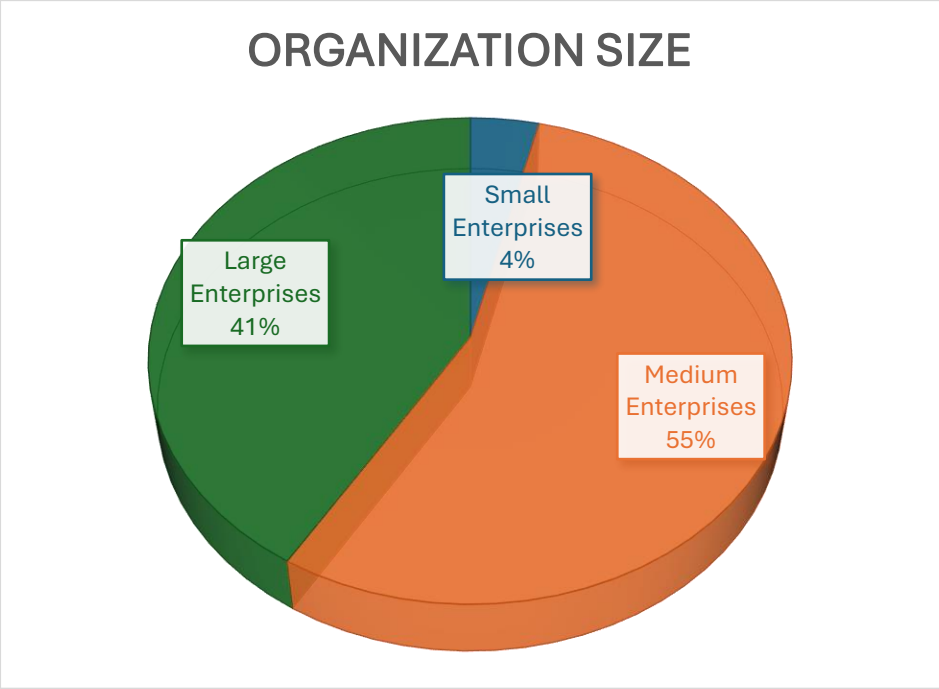

Figure 10 Pie Chart of Organization Size

5.1.6 Managerial Level Distribution

In this research, managers at three managerial levels were surveyed. According to the results, the majority of the sample are middle level managers with 55.9%. More details are shown in the following figure and table.

Table 12 Managerial Level

Managerial Level					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Middle	118	55.9	55.9	55.9
	Operational	64	30.3	30.3	86.3
	Senior	29	13.7	13.7	100
	Total	211	100	100	

Figure 11 Pie Chart of Managerial level

5.1.7 Sectors Distribution

As can be seen from the following table and figure, in the sample the respondents are working in private organizations in the financial sector. This result meets the goal of the research. The goal of this research is to test the model in private organizations operating in the financial sector.

Table 13 Sector

Sector					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Finance	211	100	100	100

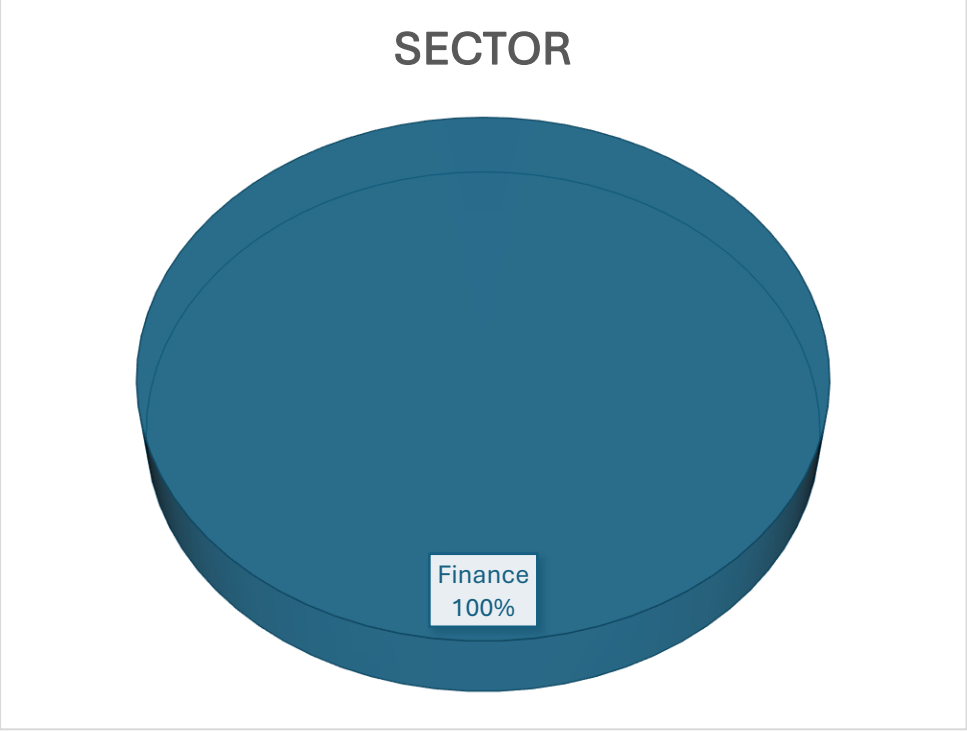

Figure 12 Pie Chart of Sector

5.1.8 Frequency of Decision Participation Distribution

The participants were asked about how frequently they participate in the process of making decisions related to technology adoption. This question was the criteria in which a survey was considered for analysis. Respondents who answered "never" were omitted from the sample. A total number of 228 were collected, only 211 were considered for analysis. Because 17 respondents answered that they never participate in decision making process regarding technology adoption issues, As can be seen from the following table, the majority of respondents usually participates in the process with 36%. More details are shown in the following figure and table.

Table 14 Decision participation

Decision Participation					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always	70	33.2	33.2	33.2
	Rarely	18	8.5	8.5	41.7
	Sometimes	47	22.3	22.3	64.0
	Usually	76	36.0	36.0	100
	Never	0	0	0	100
	Total	211	100	100	

Figure 13Decision Participation

5.1.9 Mean and Standard Deviation of Research Model Variables

The following two tables show mean and standard deviation values for each variable in the research model. The mean, or average, is a measure of central tendency that indicates the typical value within a data set. The standard deviation measures the amount of variation or dispersion in a set of data values. It indicates how much the individual data points differ from the mean. Together, they provide a comprehensive picture of the data's central tendency and variability, helping to interpret the data's overall distribution and reliability (Sekaran, 2009).

Looking at the values of mean and standard deviation of both personal and social FOMO, it can be concluded that:

1- On average, participants have a slightly positive inclination towards experiencing social FOMO, and personal FOMO. Since the midpoint of the scale is 3, a mean of 3.15 and 3.27 indicates that participants tend to agree slightly more than disagree with statements indicating social FOMO or personal FOMO. This implies a moderate level of social FOMO and personal FOMO within the sample.

2- The relatively high standard deviation of 1.02 and 1.10 shows significant diversity in how participants experience social FOMO. There is a considerable spread around the mean, indicating that individual experiences of social FOMO vary widely. Some participants experience much higher levels of social FOMO or personal FOMO, while others experience much lower levels.

Table 15 Mean and Standard Deviation Statistics

		Personal FOMO	Social FOMO	Risk	Trialability	Relative advantage	Innovation
N	Valid	211	211	211	211	211	211
	Missing	0	0	0	0	0	0
Mean		3.27	3.15	3.84	3.32	3.95	3.78
Std. Deviation		1.02	1.1	1.06	0.63	0.8	0.77
		DM knowledge	Competitive Pressure	Coercive Pressure	Normative Pressure	Adoption Intention	Blockchain Use
N	Valid	211	211	211	211	211	211
	Missing	0	0	0	0	0	0
Mean		3.58	3.15	2.55	3.33	4.02	2.16
Std. Deviation		0.97	1.17	0.98	0.96	0.97	1.07

5.2 Exploratory Factor Analysis EFA

Factor analysis is a technique well-suited for analyzing the complex, multidimensional relationships often encountered by researchers. It broadly and conceptually defines the fundamental aspects of factor analytic methods. This technique can be used to explore the underlying patterns or relationships among a large number of variables, determining if the information can be condensed into a smaller set of factors or components (Hair et al, 2013). Exploratory Factor Analysis (EFA) is particularly powerful for uncovering the underlying structure of complex data sets, making it especially useful in scale development and data reduction. It offers insights into how observed variables cluster together, aiding in further research and analysis (Hair et al, 2013).

5.2.1 EFA for Technological Characteristics

The process of doing EFA analysis starts with measuring Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) and Bartlett's Test of Sphericity. They are vital because they help determine whether the dataset is suitable for uncovering underlying factor structures, ensuring the reliability and validity of the analysis. KMO Measure ensures that the sampling adequacy is sufficient for factor analysis. Its values range from 0 to 1, the higher the value the better. Values between 0.7 and 0.8 are considered adequate. Any value under 0.5 is considered unacceptable (Kaiser, 1979). Bartlett's Test of Sphericity confirms that there are significant correlations among variables, suggesting that they can be reduced into factors. A significant test ($p < 0.05$) indicates that there are significant relationships among the variables and that factor analysis may be appropriate (Bartlett, 1951).

The EFA analysis was performed to explore the underlying structure of the technological characteristics of TOE based research model. The data of the model had met the requirements of performing EFA, as follows:

KMO = 0.785, $\chi 2$ = 947.319 and p=0.000 and df= 45.

During EFA process, TR3 was deleted due to loading on multiple factors, and TR5 was deleted due to low sampling adequacy MSA. The following table shows the final results of EFA

and reliability analyses for technological characteristics. The variables that resulted from EFA are similar to the theoretical model, with items reduced from the Trialability variable. The reliability test showed good results above 0.7. The Trialability variable will be treated later in CFA analysis.

Table 16 Results of EFA and Reliability Analyses for Technological Characteristics

Factor Name	Items	Factor Loadings	Variance Explained (%)	Reliability (Cronbach's α)
Relative Advantage	RA2	.882	37.54	0.878
	RA3	.868		
	RA4	.788		
	RA1	.788		
Risk	RS3	.904	19.578	0.878
	RS2	.886		
	RS1	.866		
Trialability	TR2	.786	13.975	0.634
	TR1	.767		
	TR4	.692		
Total Variance (%)			**71.093**	
KMO			**0.785**	
Bartlett's Test of Sphericity Chi-square			**947.319**	

5.2.2 EFA for Organizational Characteristics

The EFA analysis was performed to explore the underlying structure of the organizational characteristics of TOE based research model. The data of the model had met the requirements of performing EFA, as follows:

KMO = 0.853, $\chi 2$ = 2123.034 and p=0.000 and df= 120

During EFA process, no items were deleted due to loading on multiple factors, or low sampling adequacy MSA. The variables that resulted from EFA are similar to the theoretical model, with the same items. The variables showed a 72.514% explained variance. The reliability test

(Cronbach's **α**) showed very good results greater than 0.7. The following table shows the final results of EFA and reliability analyses for organizational characteristics:

Table 17 Results of EFA and Reliability Analyses for Organizational Characteristics

Factor Name	Items	Factor Loadings	Variance Explained (%)	Reliability (Cronbach's α)
Social FOMO	sFO9	.909	38.817	0.931
	sFO8	.875		
	sFO7	.872		
	sFO6	.821		
Personal FOMO	FO3	.838	16.105	0.863
	FO4	.825		
	FO5	.783		
	FO1	.725		
	FO2	.707		
Innovation	INV2	.835	11.293	0.840
	INV1	.779		
	INV4	.765		
	INV3	.735		
Decision Makers' Knowledge	DMK1	.820	6.299	0.789
	DMK3	.784		
	DMK2	.705		
Total Variance (%)			**72.514**	
KMO			**.853**	
Bartlett's Test of Sphericity Chi-square			**2123.034**	

5.2.3 EFA for Environmental Characteristics

The EFA analysis was performed to explore the underlying structure of the environmental characteristics of TOE based research model. The data of the model had met the requirements of performing EFA, as follows:

KMO = 0.759, $\chi 2$ = 1070.203 and p=0.000 and df= 36

During the EFA process, no items were deleted due to loading on multiple factors, or low sampling adequacy MSA. The variables that resulted from EFA are similar to the theoretical model, with the same items. The variables showed a 79.072% explained variance. The reliability test (Cronbach's **α**) showed very good results greater than 0.7. The following table shows the final results of EFA and reliability analyses for environmental characteristics:

Table 18 Results of EFA and Reliability Analyses for Environmental Characteristics

Factor Name	Items	Factor Loadings	Variance Explained (%)	Reliability (Cronbach's α)
Mimetic (Competitive) Pressures	CVP1	.884	43.794	0.895
	CVP2	.857		
	CVP3	.852		
Coercive Pressures	NP1	.858	22.791	0.868
	NP2	.851		
	NP3	.829		
Normative Pressures	CV2	.876	12.487	0.794
	CV1	.838		
	CV3	.794		
Total Variance (%)			**79.072**	
KMO			**.759**	
Bartlett's Test of Sphericity Chi-square			**1070.203**	

5.2.4 EFA for Blockchain Adoption and Use

The EFA analysis was performed to explore the underlying structure of the dependent variables of the research model. The data of the model had met the requirements of performing EFA, as follows:

KMO = 0.717, $\chi 2$ = 790.044 and p=0.000 and df= 10

During the EFA process, no items were deleted due to loading on multiple factors, low sampling adequacy MSA. The variables that resulted from EFA are similar to the theoretical model, with the same items. The reliability test (Cronbach's **α**) showed excellent results greater than 0.7.

The following table shows the final results of EFA and reliability analyses for Blockchain Adoption and Use:

Table 19 Results of EFA and Reliability Analyses for Blockchain adoption and use

Factor Name	Items	Factor Loadings	Variance Explained (%)	Reliability (Cronbach's α)
Blockchain Adoption Intention	INT2	.922	63.739	0.919
	INT1	.901		
	INT3	.901		
Blockchain Use	BU2	.947	25.284	0.928
	BU1	.943		
Total Variance (%)			**89.023**	
KMO			**0.717**	
Bartlett's Test of Sphericity Chi-square			**790.044**	

5.3 Confirmatory Factor Analysis, Convergent and Discriminant Validity Analysis of the EFA research model

Confirmatory Factor Analysis (CFA) is a statistical technique used to test whether a hypothesized factor structure fits the observed data. Unlike Exploratory Factor Analysis (EFA), which is used to identify potential underlying structures without predetermined concepts, CFA is used when the researcher has a specific model or theory in mind about the relationship between observed variables and their underlying latent factors (Bowen & Guo, 2012).

Moreover, CFA is a powerful technique for testing hypotheses about the structure of latent variables and their relationships with observed variables. By providing a framework for model specification, estimation, and evaluation, CFA helps researchers validate theoretical models and ensure the reliability and validity of their measurement instruments (Bowen & Guo, 2012; Hair et al, 2013).

In addition, CFA involves assessing the goodness of fit, which indicates how well the hypothesized model fits the observed data. Various fit indices are used to evaluate this fit. Here, in the following table, are the most commonly used fit indices and their interpretations:

Table 20 Model fit cutoff Criteria

Measure	Terrible	Acceptable	Excellent
CMIN/DF	> 5	> 3	> 1
CFI	<0.90	<0.95	>0.95
SRMR	>0.10	>0.08	<0.08
RMSEA	>0.08	>0.06	<0.06
PClose	<0.01	<0.05	>0.05

Source: Hu and Bentler (1999)

In the light of these cutoff criteria, model goodness of fit will be assessed. In this research, we will first test the CFA for the model resulted from EFA, then CFA for the original research

model will be tested. A comparison between the two models will be conducted. In addition to that, both convergent and discriminant validity analysis for the two models will be done.

5.3.1 CFA for Technological Characteristics

After completing the CFA of technological characteristics, the following structure resulted. TR4 was deleted due to low factor loading (0.48). And after completing the necessary modifications to the structure, it was possible to get a satisfying model fit result. Modifications were done in light of modification indices resulting from AMOS. Some error terms were highly correlated, and to solve this covariance path was drawn. The following two tables show fit indicators before and after modifications.

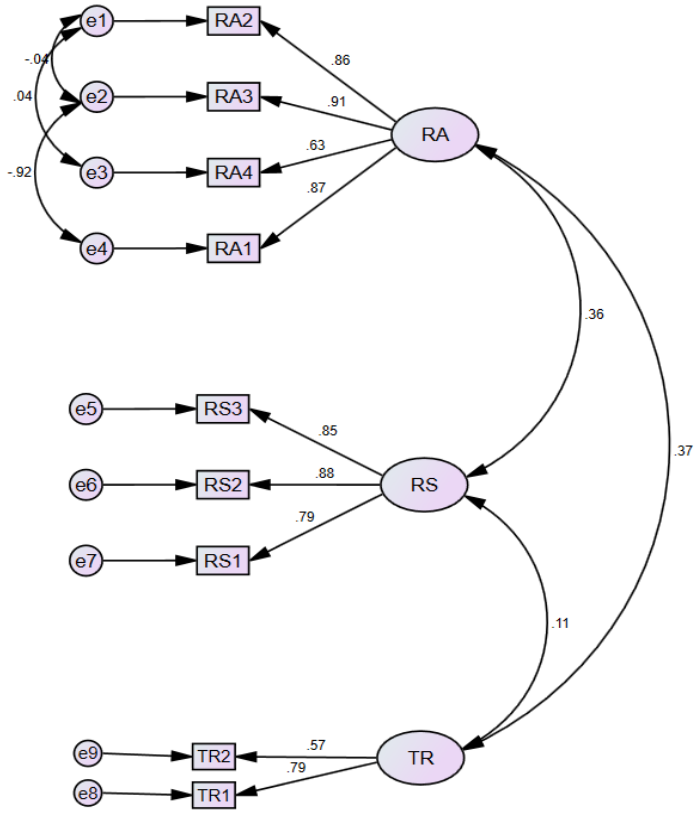

Figure 14 AMOS map for CFA of Technological Characteristics

Table 21 Fit Statistics of Measurement Model Before Modification

χ2	df	χ2/df	RMSEA	CFI	SRMR	RMR	GFI	AGFI
44.897	32	1.403	0.044	0.986	.0324	0.04	0.961	0.933

Note: * p < .05

Table 22 Fit Statistics of Measurement Model After Modification

χ2	df	χ2/df	RMSEA	CFI	SRMR	RMR	GFI	AGFI
22.552	21	1.074	0.019	0.998	0.0347	0.039	0.977	0.951

Note: * p < .05

Results of Convergent and Discriminant Validity Analysis

Convergent and discriminant validity are essential for validating the measurement model in CFA and other structural equation modeling techniques. Convergent validity ensures that indicators of the same construct are related. While discriminant validity ensures that indicators of different constructs are distinct. Discriminant validity assesses whether concepts or measurements that are supposed to be unrelated are actually unrelated. Together, they help establish the accuracy and integrity of the measurement instruments used in research (Bowen & Guo, 2012; Hair et al, 2013).

CR evaluates the internal consistency of the indicators. A CR value of 0.70 or higher is considered acceptable. AVE measures the average amount of variance that a construct captures from its indicators. An AVE of 0.50 or higher indicates good convergent validity (Hu & Bentler, 1999).

Table 23 Cutoff Criteria for validity measures

Measure	**Accepted Value**
CR	>0.7
AVE	>0.5
MSV	<AVE
MaxR(H)	>0.7

MSV ensures discriminant validity by showing that constructs share more variance with their indicators than with other constructs. The MSV should be less than the AVE for each construct. Moreover, MaxR(H) indicates the maximum reliability that a construct can achieve, with values above 0.70 suggesting good reliability (Hu & Bentler, 1999).

Table 24 Convergent and Discriminant Validity of Technological characteristics

	CR	AVE	MSV	MaxR(H)	RA	RS	TR
RA	0.894	0.683	0.135	0.921	**0.826**		
RS	0.88	0.71	0.127	0.886	0.356***	**0.842**	
TR	0.638	0.474	0.135	0.68	0.367***	0.109	**0.689**

Significance of Correlations:
*** p < 0.001

The Trialability factor was dropped from the model due to failure in both convergent (0.638) and discriminant validity (0.474) tests.

CFA of technological characteristics after deleting Trialability completely:

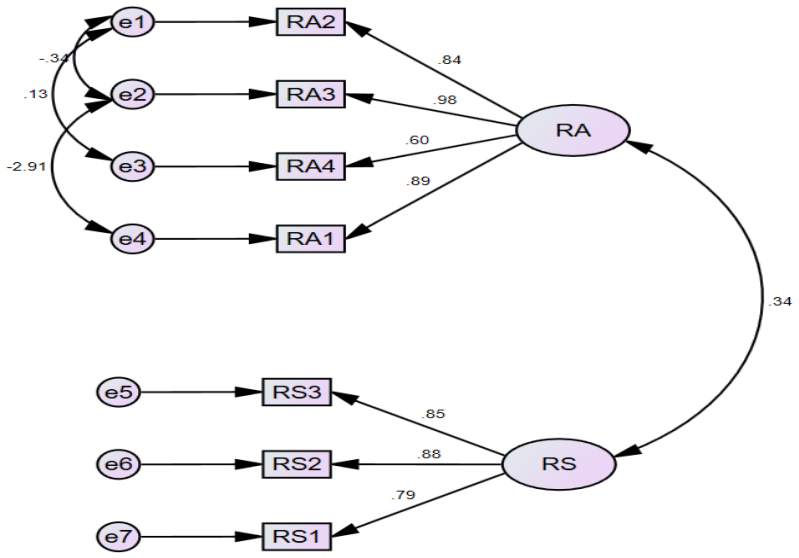

Figure 15 AMOS map for CFA of Technological Characteristics after modification

Table 25 Fit Statistics of Measurement Model

Measure	Estimate	Threshold	Interpretation
CMIN	8.206	--	--
DF	10	--	--
CMIN/DF	0.821	Between 1 and 3	Excellent
CFI	1.000	>0.95	Excellent
SRMR	0.032	<0.08	Excellent
RMSEA	0.000	<0.06	Excellent
PClose	0.880	>0.05	Excellent

The final results of CFA for technological characteristics and fit statistics shows excellent and acceptable values.

Results of Convergent and Discriminant Validity Analysis:

The results of the analysis show very good values for both convergent and discriminant validity for Relative Advantage (RA) and Risk (RS) variables, as shown in the following table:

Table 26 Convergent and Discriminant Validity of Technological characteristics after modification

	CR	AVE	MSV	MaxR(H)	RA	RS
RA	0.903	0.704	0.113	0.968	**0.839**	
RS	0.88	0.71	0.113	0.886	0.336***	**0.842**

Significance of Correlations: *** p < 0.001

5.3.2 CFA for Organizational Characteristics

After completing the CFA of organizational characteristics, the following structure resulted. Fo1 and Fo2 were deleted due to low factor loading. And after completing the necessary modifications to the structure, it was possible to get a satisfying model fit result. Modifications were done in light of modification indices resulting from AMOS. Some error terms were highly correlated, and to solve this covariance path was drawn. The following two tables show fit indicators before and after modifications.

Table 27 Fit Statistics of Measurement Model Before Modification

χ2	df	χ2/df	RMSEA	CFI	SRMR	RMR	GFI	AGFI
236.987*	98	2.418	0.082	0.933	0.0526	0.63	0.876	0.828

Note: * p < .05

Table 28 Fit Statistics of Measurement Model After Modification

χ2	df	χ2/df	RMSEA	CFI	SRMR	RMR	GFI	AGFI
123.382*	69	1.788	0.061	0.971	0.0464	0.054	0.921	0.88

Note: * p < .05

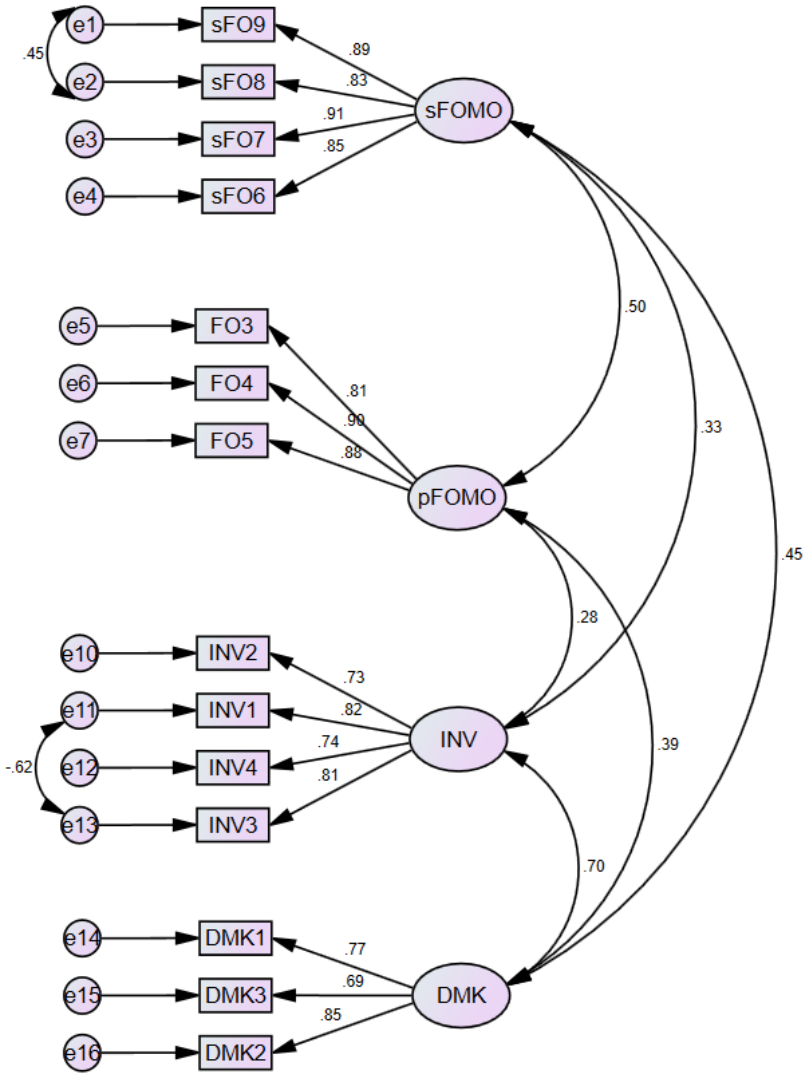

Figure 16 AMOS map for CFA of Organizational Characteristic

Results of Convergent and Discriminant Validity Analysis

In the light of table (23), the results of the analysis show very good values for both convergent and discriminant validity for Social FOMO (sFOMO), Personal FOMO (sFOMO), Innovation (INV), Decision-maker's Knowledge (DMK) variables, as shown in the following table:

Table 29 Convergent and Discriminant Validity of Organizational characteristics

	CR	AVE	MSV	MaxR(H)	sFOMO	pFOMO	INV	DMK
sFOMO	0.925	0.754	0.253	0.929	**0.868**			
pFOMO	0.898	0.746	0.253	0.905	0.503***	**0.864**		
INV	0.86	0.606	0.492	0.866	0.334***	0.282***	**0.779**	
DMK	0.814	0.595	0.492	0.833	0.453***	0.385***	0.702***	**0.772**

Significance of Correlations:
*** p < 0.001

5.3.3 CFA for Environmental Characteristics

After completing the CFA of environmental characteristics, the following structure resulted. No modifications were needed to the structure, because it was possible to get a satisfying model fit result. The following table shows fit indicators for the measurement model.

Table 30 Fit Statistics of Measurement Model

$\chi 2$	df	$\chi 2$/df	TLI	CFI	SRMR	GFI	AGFI
93.457	24	3.894	0.901	0.934	0.0678	0.923	0.856

Note: * p < .05

Results of Convergent and Discriminant Validity Analysis

In the light of table (23), the results of the analysis show very good values for both convergent and discriminant validity for Competitive Pressures (CVP), Coercive Pressures (CV), and Normative Pressures (NP) variables, as shown in the following table:

Table 31 Convergent and Discriminant Validity of Environmental characteristics

	CR	AVE	MSV	MaxR(H)	CVP	NP	CV
CVP	0.897	0.744	0.368	0.902	**0.862**		
NP	0.873	0.697	0.368	0.898	0.607***	**0.835**	
CV	0.802	0.58	0.075	0.866	0.169*	0.273***	**0.762**

Significance of Correlations: * p < 0.050
*** p < 0.001

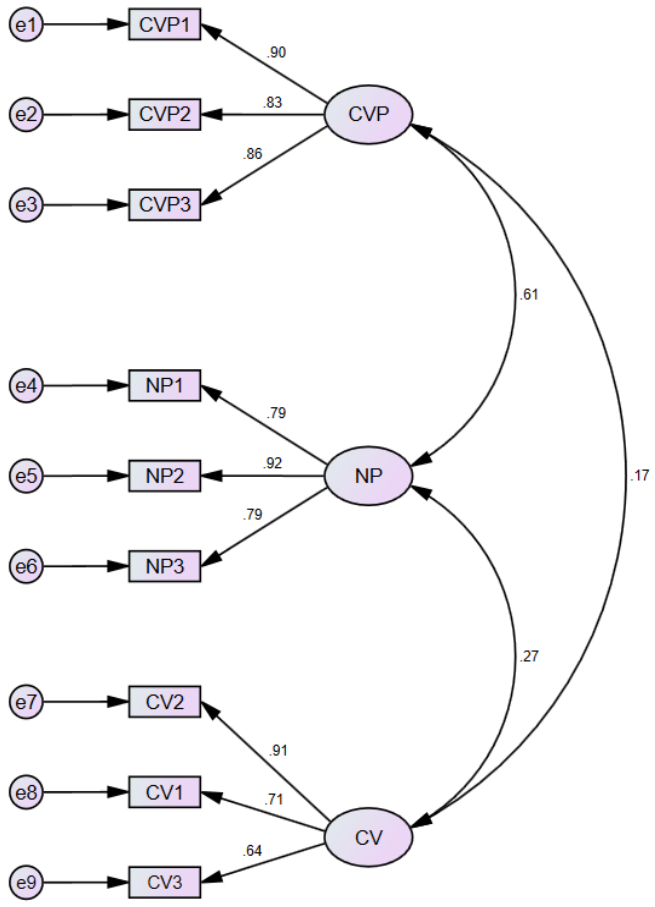

Figure 17 AMOS map for CFA of Environmental Characteristic

5.3.4 CFA for Blockchain Adoption And Use

After completing the CFA of blockchain adoption and use, the following structure resulted. No modifications were needed to the structure, because it was possible to get a satisfying model fit result. The following table shows fit indicators for the measurement model.

Table 32 Fit Statistics of Measurement Model

χ2	df	χ2/df	RMSEA	CFI	SRMR	RMR	GFI	AGFI
5.337	4	1.334	0.04	0.998	0.0106	0.012	0.99	0.963

Note: * p < .05

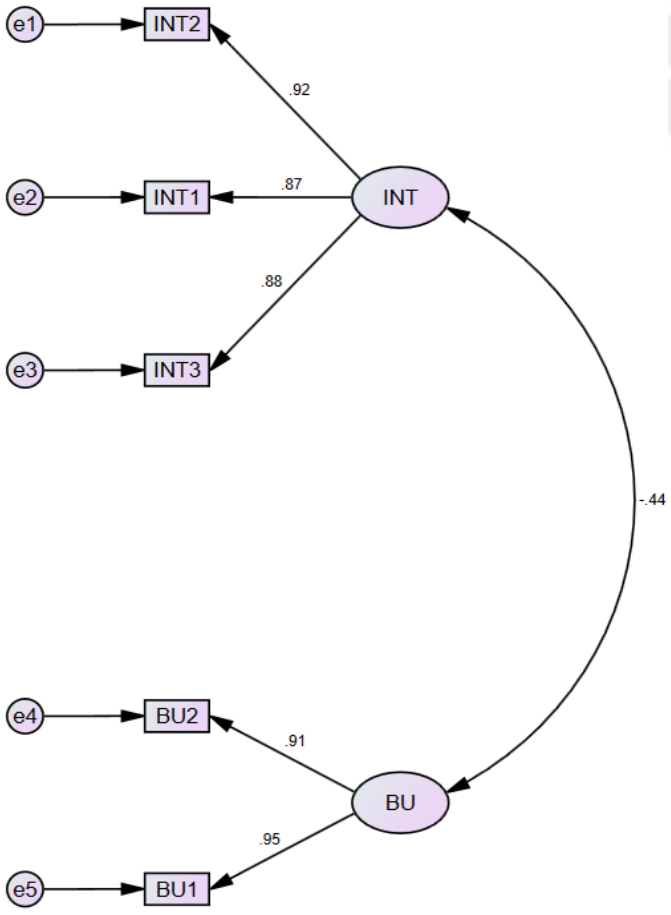

Figure 18 AMOS map for CFA of Blockchain adoption intention and Use

Results of Convergent and Discriminant Validity Analysis

In the light of table (23), the results of the analysis show very good values for both convergent and discriminant validity for Blockchain Adoption Intention (INT), and Blockchain Use (BU) variables, as shown in the following table:

Table 33 Convergent and Discriminant Validity of Blockchain adoption intention and Use

	CR	AVE	MaxR(H)	INT	BU
INT	0.92	0.793	0.924	**0.891**	
BU	0.929	0.867	0.935	-0.436	**0.931**

5.4 Confirmatory Factor Analysis, Convergent and Discriminant Validity Analysis of the Original Research Model

After testing the CFA for the model resulted from EFA, in this section CFA for the original research model will be tested. In addition to that, both convergent and discriminant validity analysis for the models will be evaluated.

5.4.1 CFA for Technological Characteristics

After completing the CFA of technological characteristics, the following structure resulted. TR3, TR4, TR5 were deleted due to low factor loadings. And after completing the necessary modifications to the structure, it was possible to get a satisfying model fit result. Modifications were done in light of modification indices resulting from AMOS. Some error terms were highly correlated, and to solve this covariance path was drawn. The following two tables show fit indicators before and after modifications.

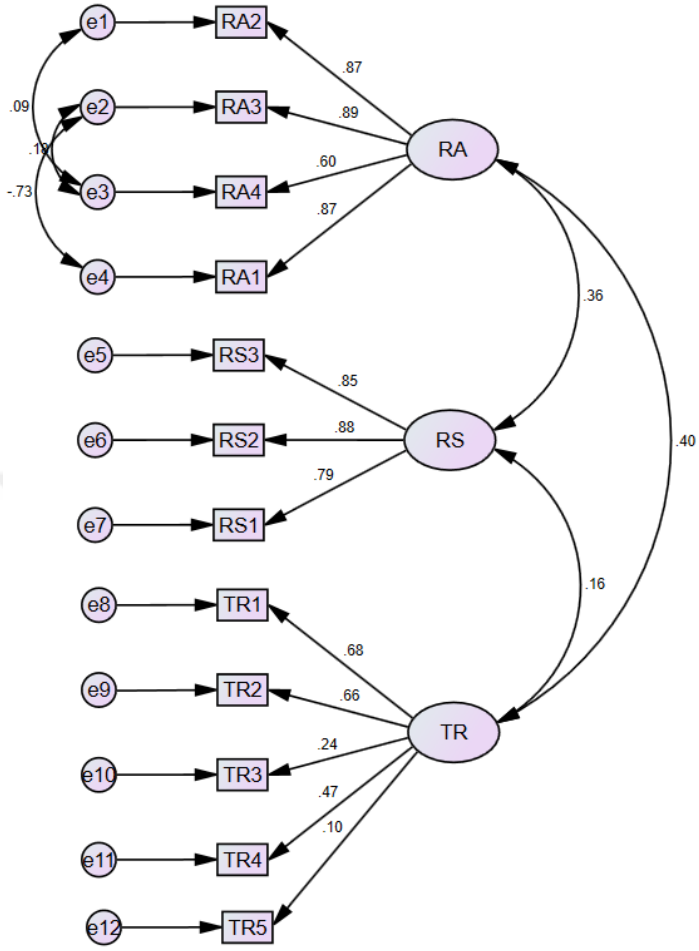

Figure 19 AMOS map for CFA of Technological Characteristics

Table 34 Fit Statistics of Measurement Model Before Modification

Measure	Estimate	Threshold	Interpretation
CMIN	27.653	--	--
DF	13	--	--
CMIN/DF	2.127	Between 1 and 3	Excellent
CFI	0.982	>0.95	Excellent
SRMR	0.044	<0.08	Excellent
RMSEA	0.073	<0.06	Acceptable
PClose	0.142	>0.05	Excellent

Table 35 Fit Statistics of Measurement Model After Modification

Measure	Estimate	Threshold	Interpretation
CMIN	20.657	--	--
DF	21	--	--
CMIN/DF	0.984	Between 1 and 3	Excellent
CFI	1.000	>0.95	Excellent
SRMR	0.037	<0.08	Excellent
RMSEA	0.000	<0.06	Excellent
PClose	0.903	>0.05	Excellent

Results of Convergent and Discriminant Validity Analysis

The Trialability factor was dropped from the model due to failure in both convergent (0.640) and discriminant validity (0.477) tests.

Table 36 Convergent and Discriminant Validity of technological characteristics

	CR	AVE	MSV	MaxR(H)	RA	RS	TR
RA	0.886	0.666	0.140	0.915	**0.816**		
RS	0.880	0.710	0.131	0.886	0.362***	**0.842**	
TR	0.640	0.477	0.140	0.688	0.374**	0.106	**0.691**

CFA of Technological characteristics after deleting Trialability factor

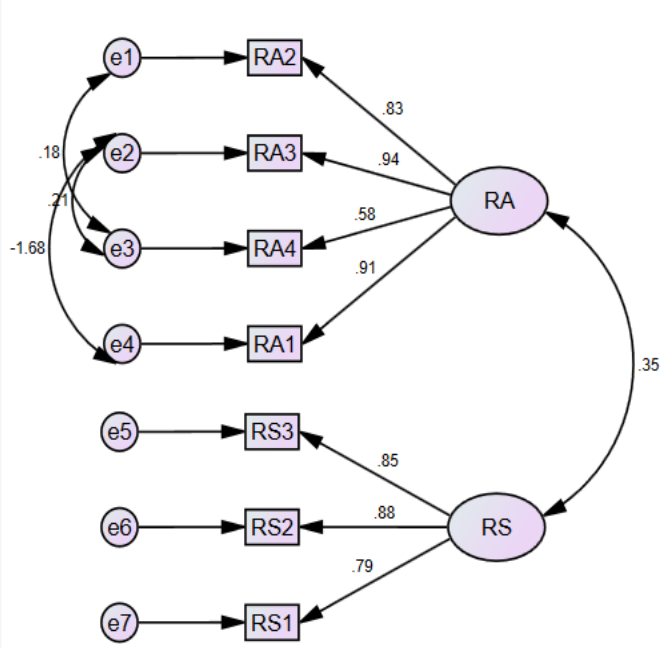

Figure 20 Final AMOS map for CFA of Technological Characteristics

Table 37 Fit Statistics of Measurement Model

Measure	Estimate	Threshold	Interpretation
CMIN	7.216	--	--
DF	10	--	--
CMIN/DF	0.722	Between 1 and 3	Excellent
CFI	1.000	>0.95	Excellent
SRMR	0.029	<0.08	Excellent
RMSEA	0.000	<0.06	Excellent
PClose	0.921	>0.05	Excellent

Results of Convergent and Discriminant Validity Analysis

In the light of table (23), The results of the analysis show very good values for both convergent and discriminant validity for Relative Advantage (RA) and Risk (RS) variables, as shown in the following table:

Table 38 Final Convergent and Discriminant Validity of Technological characteristics

	CR	AVE	MSV	MaxR(H)	RA	RS
RA	0.892	0.680	0.120	0.937	**0.825**	
RS	0.880	0.710	0.120	0.886	0.347***	**0.842**

Taking into consideration that EFA analysis resulted in identical model to the theoretical research model in terms of organizational and environmental characteristics, beside the model of Blockchain adoption intention, and use; there is no need to do CFA again for these factors.

In comparison between CFA of the original model, and CFA of the model resulted from EFA, both had resulted in the same structure. Since Trialability variable was dropped from both models.

5.5 Structural Equation Modeling (SEM)

In this section, the research model will be tested using Structural Equation Modeling (SEM). SEM is a flexible and powerful technique for exploring and testing complex relationships among variables. By integrating measurement models and structural models, SEM provides a comprehensive approach to understanding both direct and indirect effects within a theoretical framework (Hu et al, 1999). SEM combines multiple regression analysis, factor analysis, and path analysis, allowing for the modeling of complex relationships between observed and latent variables. This makes SEM valuable in various fields of research, from social sciences to marketing and beyond (Hair et al, 2013). The sample size of 211 was found to be sufficient for conducting SEM, as the minimum required sample size was 195 as calculated based on the number of latent and observed variables, and the desired probability and statistical power levels (Cohen,1988; Westland, 2010; Soper, 2024).

5.5.1 Technological Characteristics

This section presents the results of the hypothesis testing for the Technological part of the research model. And highlighting the significant paths within the model. The following figure

illustrates the final model, including the latent variables with their respective indicators, as well as the mediating and dependent variables.

Table (39) shows fit statistics for the structural equation analysis. As seen from the table the model has a good fit given that all the values are evaluated excellent against the thresholds.

Table 39 Fit Statistics of Measurement Model

Measure	Estimate	Threshold	Interpretation
CMIN	73.004	--	--
DF	47	--	--
CMIN/DF	1.553	Between 1 and 3	Excellent
CFI	0.985	>0.95	Excellent
SRMR	0.038	<0.08	Excellent
RMSEA	0.051	<0.06	Excellent
PClose	0.438	>0.05	Excellent

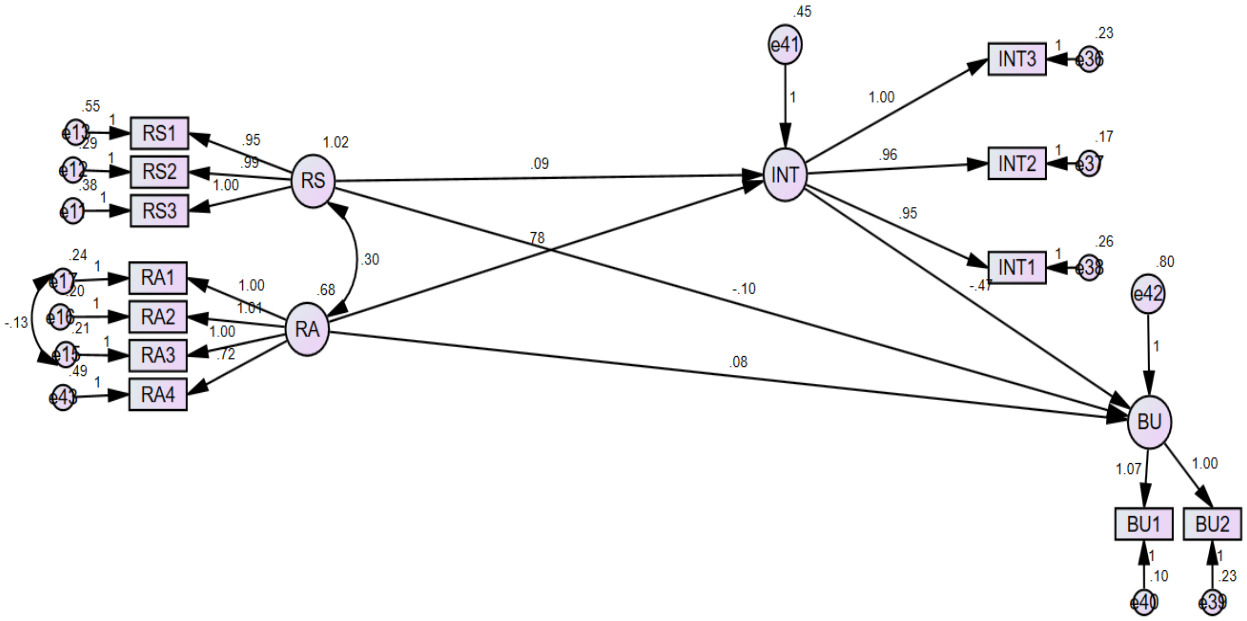

Figure 21 AMOS Map for SEM Technological characteristics

The following table shows the results of direct effects and p values for each relationship. As shown in the table, Risk has a positive impact on blockchain adoption intention, but this impact is not significant (p=0.107). In the same way, Risk has positive but insignificant impact on blockchain actual use in private financial organizations (p=0.199). On the other hand, Relative advantage, has a positive significant direct effect on adoption intention, but insignificant effect on blockchain use. Adoption intention has a significant negative effect on blockchain use. After inspecting direct effects, indirect effects through mediation were also tested.

Table 40 Results of direct effects and p values

Relationship			Standardized Estimate	Estimate	S.E	C.R	P-value
INT	<---	RS	0.1	0.094	0.059	1.611	0.107
INT	<---	RA	0.671	0.777	0.082	9.466	***
BU	<---	INT	-0.447	-0.469	0.113	-4.152	***
BU	<---	RS	-0.097	-0.096	0.075	-1.286	0.199
BU	<---	RA	0.063	0.077	0.124	0.62	0.535

To test the mediation effect, a boot strap technique was utilized. This technique is used to determine the significance of the indirect effect. If the effect falls within the confidence interval, then the effect is significant. Keeping in mind that mediation might be full or partial. The following table shows the results of mediation analysis of blockchain adoption intention variable.

Table 41 Mediation Analysis results

Relationship	Direct Effect	Indirect Effect	Confidence Interval		P-Value	Conclusion
			Lower Bound	Upper Bound		
RS->INT->BU	-0.096 (0.199)	-0.044	-0.15	0.002	0.052	No Mediation
RA->INT->BU	0.077 (0.535)	-0.364	-0.79	-0.195	0.004	Full Mediation

As seen from the table, blockchain adoption intention fully mediated the relationship between relative advantage and blockchain use. Meaning that relative advantage affects blockchain use only through adoption intention. On the other hand, risk has no indirect effect on blockchain use, since the indirect effect is not significant.

5.5.2 Organizational Characteristics

This section presents the results of the hypothesis testing for the Organizational part of the research model. And highlighting the significant paths within the model. Table (42) shows fit statistics for the structural equation analysis. As seen from the table the model has a good fit given that all the values are evaluated excellent against the thresholds.

Table 42 Fit Statistics of Measurement Model

Measure	Estimate	Threshold	Interpretation
CMIN	210.869	--	--
DF	135	--	--
CMIN/DF	1.562	Between 1 and 3	Excellent
CFI	0.974	>0.95	Excellent
SRMR	0.046	<0.08	Excellent
RMSEA	0.052	<0.06	Excellent
PClose	0.403	>0.05	Excellent
GFI	0.902	>0.90	Excellent
AGFI	0.862	>0.85	Excellent

The following figure illustrates the final model, including the latent variables with their respective indicators, as well as the mediating and dependent variables.

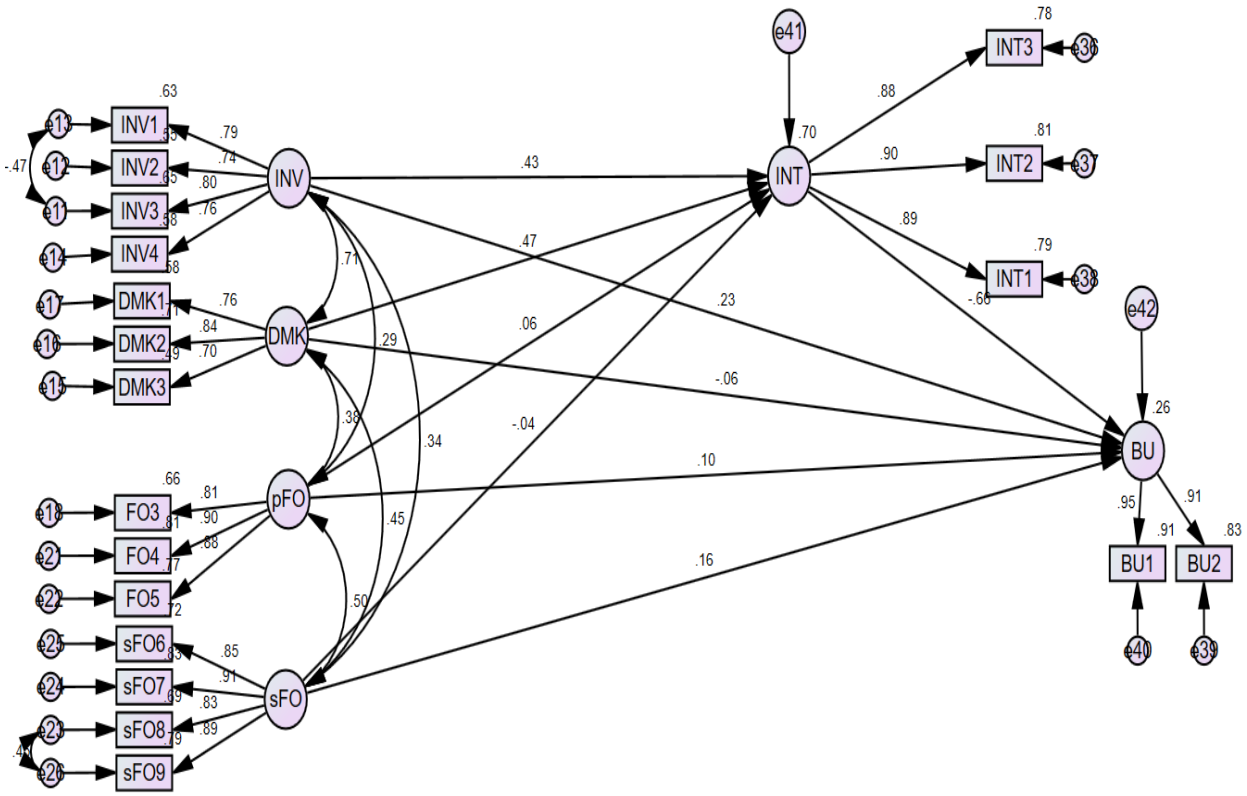

Figure 22 AMOS Map for SEM Organizational characteristics

The following table shows the results of direct effects and p values for each relationship. As shown in the table, both Innovation and decision maker's knowledge had a significant positive effect on blockchain adoption. Both personal FOMO and social FOMO have no effect on adoption intention. On the other hand, none of the organizational variables have a direct effect on blockchain use. Adoption intention has a significant negative effect on blockchain use. After inspecting direct effects, indirect effects through mediation were also tested.

Table 43 Results of direct effects and p values

Relationship			Standardized effect	Estimate	S.E.	C.R.	P
INT	<---	INV	0.426	0.526	0.107	4.9	***
INT	<---	DMK	0.472	0.45	0.094	4.798	***
INT	<---	pFO	0.056	0.058	0.061	0.942	0.346
INT	<---	sFO	-0.041	-0.041	0.061	-0.667	0.505
BU	<---	INT	-0.658	-0.704	0.16	-4.398	***
BU	<---	INV	0.233	0.307	0.165	1.862	0.063
BU	<---	DMK	-0.064	-0.065	0.149	-0.435	0.664
BU	<---	pFO	0.104	0.114	0.09	1.263	0.207
BU	<---	sFO	0.163	0.17	0.09	1.886	0.059

To test the mediation effect, a boot strap technique was utilized. This technique is used to determine the significance of the indirect effect. If the effect falls within the confidence interval, then the effect is significant. Keeping in mind that mediation might be full or partial. The following table shows the results of mediation analysis of blockchain adoption intention variable.

Table 44 Mediation Analysis results

Relationship	Direct Effect	Indirect Effect	Confidence Interval		P-Value	Conclusion
			Lower Bound	Upper Bound		
INV->INT->BU	0.307 (0.063)	-0.371	-0.924	-0.128	0.005	Full Mediation
DMK->INT->BU	-0.065 (0.664)	-0.317	-0.882	-0.118	0.012	Full Mediation
pFO->INT->BU	0.114 (0.207)	-0.41	-0.196	0.033	0.176	No Mediation
sFO->INT->BU	0.17 (0.059)	0.029	-0.063	0.186	0.496	No Mediation

As seen from the table, blockchain adoption intention fully mediated the relationship between innovation and blockchain use. Meaning that innovation affects blockchain use only through adoption intention. In the same way, blockchain adoption intention fully mediated the relationship between decision maker's knowledge and blockchain use. On the other hand, both personal FOMO and social FOMO have no indirect effect on blockchain use, since the indirect effect is not significant.

5.5.3 Environmental Characteristics

This section presents the results of the hypothesis testing for the Environmental part of the research model. And highlighting the significant paths within the model. Table (45) shows fit statistics for the structural equation analysis. As seen from the table the model has a good fit given that all the values are evaluated excellent against the thresholds.

Table 45 Fit Statistics of Measurement Model

Measure	Estimate	Threshold	Interpretation
CMIN	202.209	--	--
DF	67	--	--
CMIN/DF	3.018	Between 1 and 3	Acceptable
CFI	0.933	>0.95	Acceptable
SRMR	0.067	<0.08	Excellent
GFI	0.882	>0.90	Acceptable
TLI	0.91	>0.90	Excellent

The following figure illustrates the final model, including the latent variables with their respective indicators, as well as the mediating and dependent variables.

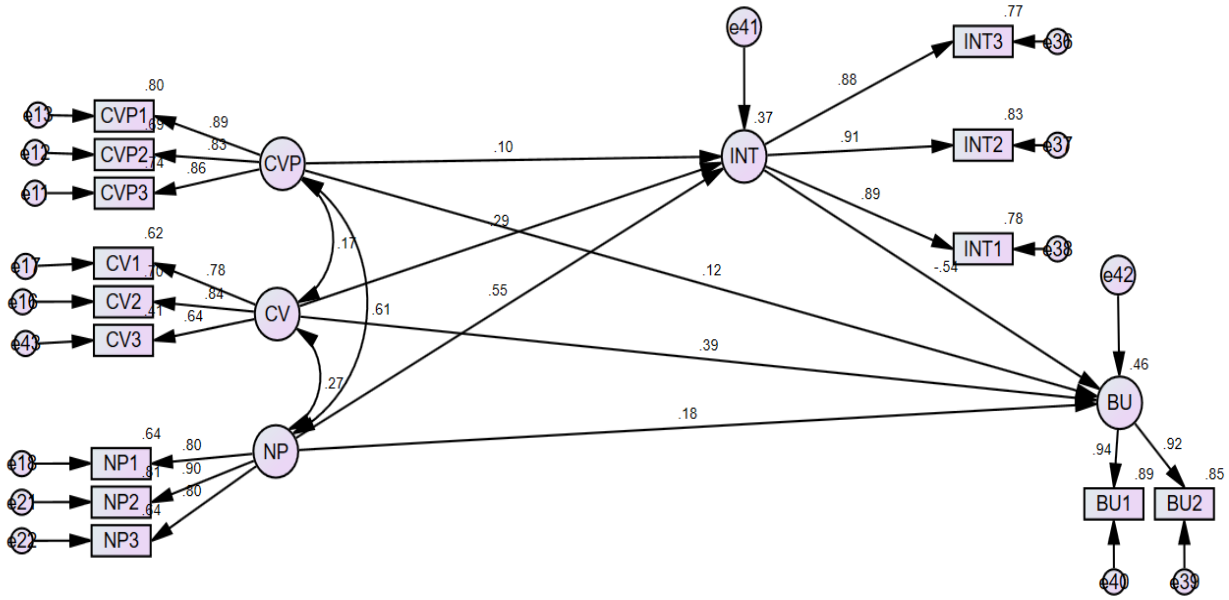

Figure 23 AMOS Map for SEM Environmental characteristics

The following table shows the results of direct effects and p values for each relationship. As shown in the table, both coercive pressures and normative pressures had a significant effect on blockchain adoption. moreover, competitive pressures have no effect on adoption intention. On the other hand, only coercive pressure has a significant direct effect on blockchain use. Adoption intention has a significant negative effect on blockchain use. After inspecting direct effects, indirect effects through mediation were also tested.

Table 46 Results of direct effects and p values

Relationship			Standardized Estimate	Estimate	S.E.	C.R.	P
INT	<---	CVP	0.101	0.089	0.077	1.165	0.244
INT	<---	CV	-0.289	-0.276	0.07	-3.95	***
INT	<---	NP	0.549	0.556	0.097	5.72	***
BU	<---	INT	-0.535	-0.582	0.091	-6.405	***
BU	<---	CVP	0.125	0.12	0.078	1.543	0.123
BU	<---	CV	0.387	0.403	0.079	5.096	***
BU	<---	NP	0.181	0.2	0.108	1.841	0.066

To test the mediation effect, a boot strap technique was utilized. This technique is used to determine the significance of the indirect effect. If the effect falls within the confidence interval, then the effect is significant. Keeping in mind that mediation might be full or partial. The following table shows the results of mediation analysis of blockchain adoption intention variable.

Table 47 Mediation Analysis results

Relationship	Direct Effect	Indirect Effect	Confidence Interval		P-Value	Conclusion
			Lower Bound	Upper Bound		
CVP->INT->BU	0.12 (0.123)	-0.052	-0.159	0.113	0.472	No Mediation
CV->INT->BU	0.403 (***)	0.161	0.078	0.269	0.008	Partial mediation
NP->INT->BU	0.2 (0.066)	-0.324	-0.559	-0.161	0.006	Full Mediation

As seen from the table, blockchain adoption intention fully mediated the relationship between normative pressures and blockchain use. Meaning that normative pressures affect blockchain use only through adoption intention. In the same way, blockchain adoption intention partially mediated the relationship between coercive pressures and blockchain use. Meaning that, coercive pressures effects blockchain use both directly and indirectly through blockchain adoption intention. On the other hand, competitive pressures have no indirect effect on blockchain use, since the indirect effect is not significant.

5.6 Moderation effect of FOMO

This study assesses the moderation effect of Personal FOMO (pFOMO) and Social FOMO (sFOMO) on the relationship between the independent variables of the research model (RS, RA, INV, DMK, CVP, CV, NP) and the blockchain adoption intention (INT). The results revealed that personal FOMO only moderated the relationship between Competitive pressures (CVP) and

blockchain adoption intention (INT). As shown in the following table (48): pFOMO weakens the positive relationship between CVP and INT.

Table 48 Moderation Analysis results

			Beta	C.R.	P.Value
Intention	<---	Compatitive_Pressure	0.018	0.394	0.694
Intention	<---	Personal_FO	0.069	1.462	0.144
Intention	<---	M_CVPxpFO	-0.08	-1.98	0.048

The graph presented shows the results of a moderation analysis examining the interaction between CVP and pFOMO on the dependent variable INT (intention). The moderation analysis explores how different levels of pFOMO (low vs. high) influence the relationship between CVP and INT.

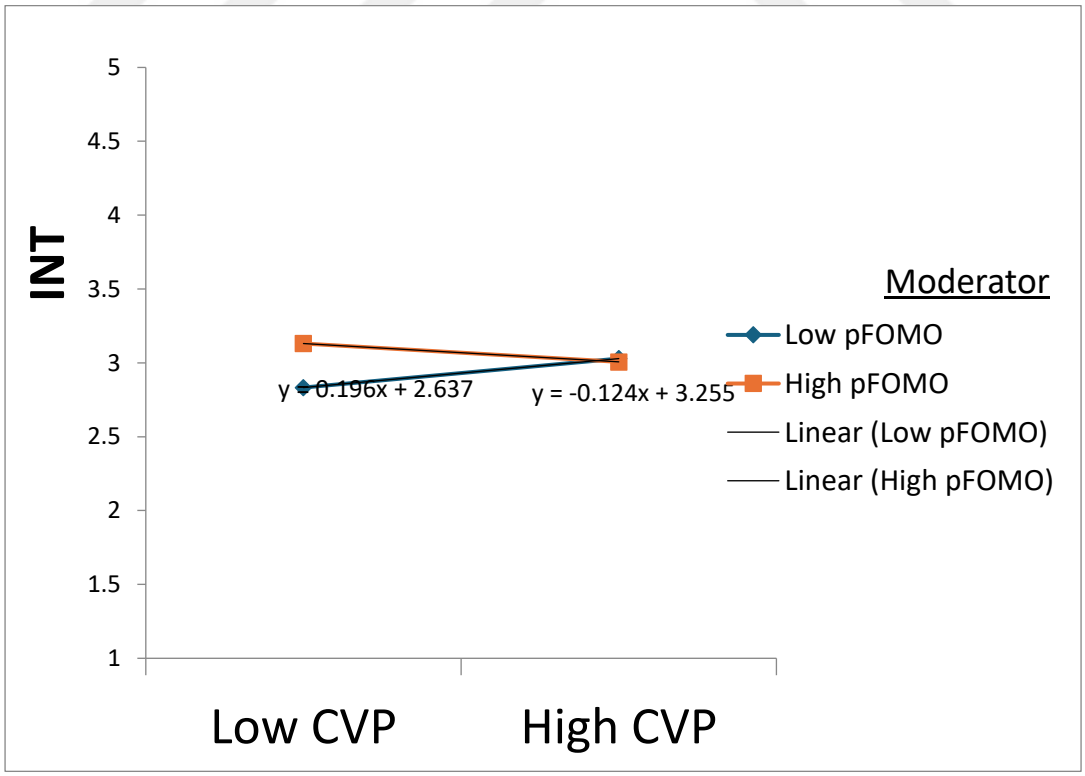

Figure 24 Slope of Moderation

For individuals with low pFOMO, the slope is positive (0.196), suggesting a slight increase in INT as CVP increases. The intercept is 2.637, indicating the baseline level of INT when CVP is at its minimum for low pFOMO individuals. For individuals with high pFOMO, the slope is negative (-0.124), indicating a slight decrease in INT as CVP increases. The intercept is 3.255, showing a higher baseline level of INT compared to those with low pFOMO when CVP is at its minimum.

In other words, The differing slopes suggest that pFOMO moderates the relationship between CVP and INT. Specifically, as CVP increases, individuals with low pFOMO tend to show a slight increase in intention, whereas those with high pFOMO show a slight decrease. High pFOMO individuals start with a higher intention, but their intention decreases as CVP increases, whereas low pFOMO individuals start with a lower intention that slightly increases with higher CVP.

5.7 Summary of Research Hypothesis Results

Table 49 Summary of Hypothesis Results direct and mediating effect

Hypothesis number	Hypothesis statement	Result
H1	Perceived risks associated with blockchain have a negative effect on the adoption of blockchain in organizations.	Not Supported
H2	Trialability of blockchain have a positive effect on the adoption of blockchain in organizations.	*Not tested*
H3	Relative advantage of blockchain have a positive effect on the adoption of blockchain in organizations.	**Supported**
H4	Organization's innovativeness has a positive effect on the adoption of blockchain in organizations.	**Supported**
H5	Decision Maker's Knowledge has a positive effect on the adoption of blockchain in organizations.	**Supported**
H6	Personal FOMO has a positive effect on the adoption of blockchain in organizations	Not Supported
H7	Social FOMO has a positive effect on the adoption of blockchain in organizations.	Not Supported
H8	Competitive pressures have a positive effect on the adoption of blockchain in organizations.	Not Supported
H9	Coercive pressures have a positive effect on the adoption of blockchain in organizations.	Not Supported
H10	Normative pressures have a positive effect on the adoption of blockchain in organizations.	**Supported**
H11	Blockchain Adoption Intention has a positive effect on the actual Blockchain Use.	Not Supported
H12	Blockchain Adoption Intention mediates the relationship between Perceived Risk and Blockchain Use.	Not Supported
H13	Blockchain Adoption Intention mediates the relationship between Trialability and Blockchain Use.	*Not tested*
H14	Blockchain Adoption Intention mediates the relationship between Relative Advantage and Blockchain Use.	**Supported**
H15	Blockchain Adoption Intention mediates the relationship between Innovativeness and Blockchain Use.	**Supported**
H16	Blockchain Adoption Intention mediates the relationship between Decision Maker's Knowledge and Blockchain Use.	**Supported**
H17	Blockchain Adoption Intention mediates the relationship between Personal FOMO and Blockchain Use.	Not Supported
H18	Blockchain Adoption Intention mediates the relationship between Social FOMO and Blockchain Use.	Not Supported
H19	Blockchain Adoption Intention mediates the relationship between Competitive Pressures and Blockchain Use.	Not Supported
H20	Blockchain Adoption Intention mediates the relationship between Coercive Pressures and Blockchain Use.	**Supported**
H21	Blockchain Adoption Intention mediates the relationship between Normative Pressures and Blockchain Use.	**Supported**

Table 50 Summary of Hypothesis Results Moderation effect

Hypothesis number	Hypothesis statement	Result
H6a	Personal FOMO moderates the relationship between perceived risk and organization's blockchain adoption intention.	Not Supported
H6b	Personal FOMO moderates the relationship between trialability and organization's blockchain adoption intention.	*Not tested*
H6c	Personal FOMO moderates the relationship between relative advantage and organization's blockchain adoption intention.	Not Supported
H6d	Personal FOMO moderates the relationship between innovativeness and organization's blockchain adoption intention.	Not Supported
H6e	Personal FOMO moderates the relationship between decision maker's knowledge and organization's blockchain adoption intention.	Not Supported
H6f	Personal FOMO moderates the relationship between competitive pressure and organization's blockchain adoption intention.	**Supported**
H6g	Personal FOMO moderates the relationship between coercive pressure and organization's blockchain adoption intention.	Not Supported
H6h	Personal FOMO moderates the relationship between normative pressure and organization's blockchain adoption intention.	Not Supported
H7a	Social FOMO moderates the relationship between perceived risk and organization's blockchain adoption intention.	Not Supported
H7b	Social FOMO moderates the relationship between trialability and organization's blockchain adoption intention.	*Not tested*
H7c	Social FOMO moderates the relationship between relative advantage and organization's blockchain adoption intention.	Not Supported
H7d	Social FOMO moderates the relationship between innovativeness and organization's blockchain adoption intention.	Not Supported
H7e	Social FOMO moderates the relationship between decision maker's knowledge and organization's blockchain adoption intention.	Not Supported
H7f	Social FOMO moderates the relationship between competitive pressure and organization's blockchain adoption intention.	Not Supported
H7g	Social FOMO moderates the relationship between coercive pressure and organization's blockchain adoption intention.	Not Supported
H7h	Social FOMO moderates the relationship between normative pressure and organization's blockchain adoption intention.	Not Supported

6 DISCUSSION AND CONCLUSIONS

This chapter is dedicated to discussing the results of the research. Here, a detailed analysis of the findings will be presented. Moreover, interpretation of the data within the context of the research objectives and hypotheses outlined earlier will be discussed. A detailed analysis of the findings will be presented in this chapter, with the results of various statistical techniques being explored in chapter 5 of this dissertation. Initially, the underlying structure of the data was identified through the results of the Exploratory Factor Analysis (EFA). Following this, the factor structure suggested by the EFA is validated by the Confirmatory Factor Analysis (CFA).

The relationships between the variables are assessed and the hypothesized model is tested through the outcomes of the Structural Equation Modeling (SEM). SEM results will be discussed too. Additionally, the results of mediation analysis are discussed to explore the effect of the independent variables on Blockchain Use (BU) transmitted through a Blockchain adoption Intention (INT). Similarly, results of moderation analysis are explored to reflect the effect of FOMO.

Additionally, the implications of these results will be explored, and how they contribute to the existing body of knowledge in the field. More than that, any unexpected outcomes will be examined, along with possible explanations for these differences. The chapter will also consider the limitations of the study, providing a balanced perspective on the reliability and validity of the results. Finally, areas for future research will be suggested, drawing on the insights gained from this study to propose new opportunities for investigation.

Mainly, this research was pursued to take a closer look at the factors that might be affecting decision makers in organizations to adopt new technology by studying both institutionalization powers and FOMO effect. A comprehensive quantitative research model was needed to study blockchain adoption on an organizational level. The research model was developed in order to bridge this gap in the existent literature. Beside quantitative study, applying FOMO to the context of management and business administration will provide more insights to understand technology adoption in organizations.

In addition, this research was originally undertaken to answer the following research questions:

RQ1: What are the factors of blockchain technology adoption in organizations?

RQ1 was answered throughout the theoretical background chapter of this dissertation.

RQ2: What are the factors that affect organizations positively\negatively to adopt blockchain technology?

RQ2 was answered in the quantitative part of the research. The results of the hypothesis clearly stated the effect of each factor. Detaitls in table (49) and table (50).

RQ3: What is the effect of FOMO on blockchain adoption intention in organizations?

In the sample of this study, FOMO levels were moderate. All possible effects of FOMO on blockchain adoption intention in organizations were tested. In the context of this research, FOMO didn't have a significant direct effect on blockchain adoption intention. Personal FOMO only moderated the effect of competitive pressures on blockchain adoption intention. In different contexts, FOMO may have higher levels and may show significant effects, which need to be in future research.

6.1 Interpretations of EFA and CFA Results

The results of Exploratory Factor Analysis (EFA) resulted in a model similar to the original research model with little alterations. This shows that the used scales fitted with the culture of Turkish private organizations in the financial sector. Most of the scales demonstrated good reliability and validity, which suggests that the constructs being measured are relevant and appropriately adapted for this specific cultural and organizational context.

However, the "Trialability" scale did not perform as well. It showed low reliability levels and failed to pass the convergent and discriminant validity tests. This suggests that the items within the "Trialability" scale were not consistently measuring the same construct, or that the construct

itself may not be as applicable or understood in the same way within Turkish private financial organizations. This result could be interpreted in several ways:

1. Cultural Differences: The concept of "Trialability" might not be as relevant or might be interpreted differently in Turkish private financial organizations compared to other contexts. This could be due to differing attitudes towards innovation, risk, and testing new technologies within these organizations (Sousa & Rojjanasrirat, 2011; Alserr & Salepçioğlu, 2021).

2. Scale Adaptation: The items used to measure "Trialability" may need further refinement or rewording to better capture the essence of the construct in the Turkish financial sector. This could involve a re-translation of the original scale or qualitative research to understand how decision-makers in these organizations perceive and experience "Trialability" (Sousa & Rojjanasrirat, 2011).

3. Sector-Specific Factors: The financial sector in Turkey might have specific characteristics that affect the relevance of "Trialability". For instance, regulatory constraints or organizational practices unique to the sector might influence how new technologies are tested and adopted (Alserr & Salepçioğlu, 2021).

Keeping in mind the EFA and CFA results, the trialability factor was not tested in the analytical tests. And based on that hypothesizes that are relevant to the trialability factor (H2, H13, H6b, H7b) were not tested. Consequently, the Trialability scale requires further investigation and possibly revision. Understanding the specific reasons for its low reliability and validity can help in refining the scale, ensuring that it accurately reflects the factors influencing technology adoption in Turkish private financial organizations.

More than that, the EFA test for all the three characteristics of TOE model was successful. In terms of Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) and Bartlett's Test of Sphericity. KMO Measure ensures that the sampling adequacy is sufficient for factor analysis (Bartlett, 1951). Bartlett's Test of Sphericity confirms that there are significant correlations among variables, suggesting that they can be reduced into factors (Kaiser, 1979). All the results were within the necessary thresholds. Based on that, the successful EFA for the TOE model's three

characteristics means that the factors identified during the analysis accurately represent the constructs defined by the model. This indicates that the scales used to measure these characteristics are reliable and valid within the context of Turkish private organizations in the financial sector.

This result was also confirmed by the reliability test (Cronbach's alfa), most scales scored Cronbach's α grater that 0.8 which demonstrates strong internal consistency and reliability of the scales used in the study. This result enhances the validity of the research findings and provides confidence in the accuracy of the interpretations made based on these scales. This will allow to draw robust conclusions and make informed decisions based on the results obtained from these scales (Hair et al, 2013).

The results of the Confirmatory Factor Analysis (CFA) indicate that the model fit is within a good range for all indicators of model fit. The positive results of the CFA provide strong support for the validity and reliability of the measurement model used in the study. These findings enhance the credibility of the research outcomes and have important implications for both research and practice in the field of technology adoption. Also, all the factors of the research model showed good validity results (Hair et al, 2013). By proving convergent and discriminant validity, this study confirms that the measurement tools used to assess the constructs of blockchain adoption factors accurately capture the intended theoretical concepts within the context of Private financial Turkish organizations.

The validation of measurement tools for Turkish organizations opens up opportunities for future research to build upon this foundation. Researchers can now confidently use these tools in subsequent studies to further explore and understand the dynamics of technology adoption and organizational behavior within the Turkish context.

6.2 Interpretations of Research Hypothesis Results

Subsequently, after discussing the results of EFA and CFA, research hypothesis results and SEM can be discussed. The SEM analysis revealed that H1 is not supported. Risk factor has no significant effect on Blockchain adoption intention. This result suggests that within the unique context of private Turkish organizations in the financial sector, perceptions of risk may not play a

significant role in influencing blockchain adoption intentions. Alternatively, the lack of a significant effect of the risk factor may indicate that the perceived benefits of adopting blockchain technology outweigh the perceived risks for private Turkish organizations in the financial sector. These organizations may perceive blockchain as offering significant advantages such as increased efficiency, transparency, and security, which outweigh any potential risks. Which was supported in the results of H3 hypothesis, that relative advantage has a positive significant effect on blockchain adoption intentions.

The SEM analysis revealed that H3 is supported, It suggests that organizations in the private Turkish financial sector perceive blockchain technology as offering significant advantages over existing systems or technologies. The positive effect of relative advantage on blockchain adoption intentions indicates that decision-makers within these organizations prioritize the potential benefits of blockchain technology when considering adoption. This suggests a strategic approach to technology adoption, where organizations weigh the expected advantages against the associated costs and risks (Onay & Öztaş, 2018). Moreover, the positive relationship between relative advantage and blockchain adoption intentions underscores the role of innovation drivers in shaping organizational behavior. Organizations that prioritize innovation and seek to stay ahead of industry trends may be more inclined to adopt emerging technologies like blockchain, particularly when they perceive clear advantages over existing alternatives, which was supported in the results of H4 hypothesis, that Innovativeness has a positive significant effect on blockchain adoption intentions.

The SEM analysis revealed that H4 is supported. The positive effect of Innovativeness on blockchain adoption intentions suggests that financial organizations in Turkey value Innovativeness and are motivated to adopt new technologies to maintain or enhance their competitive edge. These organizations may see blockchain adoption as a way to demonstrate technological leadership within the industry (Ghobakhloo et al, 2011; Skafi et al, 2020; Malik et al, 2021). It indicates that decision-makers within financial organizations in Turkey recognize the strategic importance of Innovativeness in driving organizational growth and success. They may view blockchain technology as an innovative solution that aligns with their strategic objectives and supports their long-term vision.

In addition to that, the SEM analysis revealed that H5 is supported. Which implies that Decision Maker's Knowledge has a positive effect on the adoption of blockchain within the unique context of private Turkish organizations in the financial sector. The H5 result agrees with previous research. This finding suggests that decision-makers who possess a higher level of knowledge about blockchain technology are more likely to perceive its benefits and make informed decisions regarding its adoption. Their understanding of blockchain's capabilities, applications, and potential impacts likely drives their confidence in integrating this technology within their organizations (Ghobakhloo et al, 2011; Chandra & Kumar, 2018). Moreover, Knowledgeable decision-makers are better trained to assess and mitigate the uncertainties and risks associated with adopting new technologies like blockchain. Their expertise allows them to anticipate challenges and develop effective strategies to address potential issues, thus facilitating smoother adoption processes (Foster, Hurriyati, & Johansyah, 2022). This agrees with and is consistent with the results of H1 and H3. Were high levels of perceived relative advantage is coming from high levels of Decision Maker's Knowledge about blockchain technology, and both have higher priority in the context of technology adoption that Perceived Risks (Foster et al, 2022).

Moreover, both H6 and H7 were not supported by SEM results. H6 and H7 are regarding FOMO effect both personal and social respectively. Indicating that neither personal Fear of Missing Out (pFOMO) nor social Fear of Missing Out (sFOMO) have a significant positive effect on blockchain adoption intention in private Turkish organizations in the financial sector. This suggests that FOMO, whether personal or social, is not a primary driver for blockchain adoption decisions in these organizations. Decision-makers in the financial sector might rely more on rational, strategic considerations rather than emotional or social pressures when evaluating new technologies. In the same way, the decision-making process in private Turkish financial organizations is structured and formalized, focusing on thorough cost-benefit analyses, risk assessments, and alignment with strategic goals rather than being influenced by FOMO. This indicates a mature and methodical approach to technology adoption (Huyut, & Temur, 2021).

More than that, H8 is not supported, indicating that competitive (mimetic) pressures have no significant effect on blockchain adoption intention in private Turkish organizations in the financial sector. This suggests that private Turkish financial organizations are not significantly

influenced by the actions of their competitors when deciding whether to adopt blockchain technology. Instead, they may rely more on their internal assessments and strategic priorities rather than imitating competitors. Organizations in this sector might prioritize internal factors such as cost-benefit analyses, risk management, regulatory compliance, and alignment with long-term strategic goals over external pressures. This indicates a preference for making decisions based on intrinsic organizational needs and capabilities rather than external competitive dynamics (Mujalli & Almgrashi, 2020; Huyut, & Temur, 2021). Additionally, the lack of influence from mimetic pressures could suggest that the perception of blockchain technology's maturity and relevance varies widely. Organizations might have differing views on blockchain's applicability and benefits, leading them to make independent adoption decisions rather than following industry trends (Lustenberger, Malešević, & Spychiger, 2021; Chhina et al, 2023).

Looking at the results of H7 and H8 collectively, they suggest that neither social influences (Fear of Missing Out) nor competitive pressures (mimetic pressures) significantly affect blockchain adoption intentions in private Turkish organizations in the financial sector. Both results suggest that private Turkish financial organizations operate independently of social and competitive pressures when it comes to technology adoption. This indicates a decision-making culture that does not heavily weigh external peer behaviors or competitive actions in their technology adoption strategies.

Additionally, SEM results revealed that H9 is not supported, indicating that coercive pressures have no significant effect on blockchain adoption intention in private Turkish organizations in the financial sector. This result suggests that regulatory and legal requirements (coercive pressures) are not strong drivers of blockchain adoption in these organizations. It implies that current regulations and legal frameworks may not be compelling enough to force or strongly encourage the adoption of blockchain technology. The regulatory environment in Turkey is not yet sufficiently developed to push blockchain adoption (Erol et al, 2021, Alnıpak & Toraman, 2024). This is due to the fact that blockchain technology is relatively new and still has low adoption rates.

Moreover, H10 is supported, implying that normative pressures have a significant positive effect on blockchain adoption intentions in private Turkish organizations in the financial sector.

This suggests that professional standards, industry norms, and best practices exert a strong influence on the adoption of blockchain technology. Financial organizations are likely influenced by the expectations and recommendations of industry bodies, professional associations, and other normative institutions. The support for H10 indicates that industry-wide trends and movements toward blockchain adoption create a normative environment where adopting the technology becomes the expected course of action. This collective movement can create a momentum that individual organizations find compelling to join. Also, there is a strong internal culture within these organizations that values conformity to industry standards and norms. This culture likely promotes the adoption of technologies that are perceived as aligning with the professional and ethical standards of the industry (Hartley, Sawaya, & Dobrzykowski, 2022; Mishra et al, 2024).

However, the SEM results revealed that H11 is not supported, indicating that blockchain adoption intention does not have a significant positive effect on the actual blockchain use in private Turkish organizations in the financial sector. This suggests a significant gap between the intention to adopt blockchain and its actual implementation. Organizations are expressing interest and intention to adopt blockchain but face barriers that prevent them from translating these intentions into action. This might be due to several adoption barriers such as: implementation challenges, and lack of organizational readiness (Ullah et al, 2020; Yadav et al, 2020; Xu et al, 2021).

The SEM also evaluated the indirect effects of independent variables on blockchain use, the results came in compliance with TAM theory. That the effect of different factors of technology adoption is mediated by the intention to adopt that technology (Davis, 1989). So, it was not surprising to see that independent variables' effect on blockchain actual use is mediated by blockchain adoption intention. On this stream, H14, H15, H16, H20, H21 was supported, where the effect of Relative Advantages, Innovativeness, Decision Makers' Knowledge, Coercive Pressures, and Normative Pressures on blockchain use, respectively, was mediated by blockchain adoption intention. Where the effect passes through blockchain adoption intention. Moreover, H12, H17, H18, H19 were not supported. Implying that the effect of Perceived Risk, pFOMO, sFOMO, and Competitive Pressures on blockchain actual use, is not mediated by blockchain adoption intention. Suggesting that these factors are not influential in these organizations.

Finally, moderation hypotheses (H6a throughout H6h and H7a throughout H7h) were all unsupported except for H6f. this implies that FOMO (Fear of Missing Out) did not moderate the relationship between independent variables and blockchain adoption intention, which consequently suggests that the social and psychological pressures associated with FOMO do not significantly influence how various factors impact the decision to adopt blockchain technology. This again highlights that organizations base their adoption intentions more on intrinsic and strategic factors rather than on psychological or social influences (Huyut, & Temur, 2021). The moderation effect of competitive pressures (H6f) was discussed in detail in chapter 5. This was the only proved FOMO effect; Decision-makers who are personally concerned about staying current with industry trends and not falling behind competitors are more likely to translate competitive pressures into actionable intentions to adopt new technologies.

6.3 Theoretical Implications

The fact that the Exploratory Factor Analysis (EFA) resulted in a model similar to the theoretical research model carries several theoretical implications, particularly regarding the validity and robustness of the constructs within the Technology-Organization-Environment (TOE) framework (Hair et al, 2013). It indicates that the three characteristics of TOE are robust across different contexts, suggesting that the theoretical model is well-founded and applicable to the specific setting of Turkish private organizations in the financial sector. Also, it means that the underlying constructs proposed in the TOE framework (such as relative advantage, innovativeness, and competitive pressures) are empirically distinguishable and relevant in the context of blockchain adoption in Turkish financial organizations. Also, this fact promotes that TOE model is applicable across different cultural contexts (Hair et al, 2013; Skafi et al., 2020; Chittipaka et al., 2023; Baral et al., 2023).

On the other stream, the theoretical implications of the results of the research are multidimensional. And they contribute to the management and technology adoption literature in several ways. First, the minimal impact of perceived risk challenges traditional assumptions and suggests that risk may not be as significant a barrier in certain contexts, particularly in regulated sectors. This implies the need for context-specific adjustments to technology adoption models. And

it challenges traditional views that emphasize risk as a primary barrier to technology adoption (Yoo et al., 2018, Malik et al, 2021).

Also, the positive impact of innovativeness and decision-makers' knowledge on adoption intentions highlights the importance of internal capabilities and awareness in technology adoption. This aligns with theories that emphasize the role of organizational learning and capability building in innovation adoption, such as DOI and TOE (Rogers, 1983; Tornatzky & Fleischer, 1990).

In terms of institutional theory, although coercive pressures' direct effect on adoption intentions was not supported, their mediated effect through adoption intentions suggests that regulatory and legal environments indirectly influence adoption decisions by shaping organizational intentions. In addition to that, the non-significant effect of competitive pressures, except when moderated by personal FOMO, suggests that competitive dynamics alone are insufficient to drive adoption intentions. This indicates that organizations might prioritize strategic fit and intrinsic benefits over competitive mimicry.

Moreover, the complex interactions between competitive pressures, personal FOMO, and normative pressures suggest that environmental factors influence adoption through more refined ways than previously understood. This calls for a more detailed examination of how external pressures are perceived and acted upon within organizations.

In addition, although the FOMO's effect was limited in our study, the finding that personal FOMO moderates the relationship between competitive pressures and adoption intentions introduces a refined understanding of how individual psychological factors can influence organizational decisions. This extends existing theories by integrating personal-level influences (such as FOMO) with organizational-level phenomena (such as competitive pressures).

Finally, the mediation of various factors through adoption intentions reinforces the idea that intentions are a critical antecedent to actual technology use, as proposed by TAM and its extensions (Davis, 1989; Venkatesh & Davis, 2000).

6.4 Practical Implications

Practitioners and managers can benefit from the validated measurement tools by using them to assess and evaluate technology adoption processes within Turkish organizations. By understanding the factors influencing technology adoption more accurately, organizations can make more informed decisions and develop strategies that are better aligned with their unique cultural and organizational context.

Moreover, the support for H3 hypothesis regarding relative advantage, provides practical insights for organizations in the private Turkish financial sector considering blockchain adoption. It highlights the importance of assessing the relative advantages of blockchain technology and aligning adoption decisions with strategic objectives and organizational priorities.

In addition to that, the support for H4 hypothesis highlights the role of innovation in driving industry transformation within the financial sector in Turkey. By embracing blockchain technology, financial organizations have the potential to reshape traditional business models, streamline processes, and create new value propositions for customers.

More than that, The findings highlight the critical role of decision maker's knowledge and leadership in driving technological change within organizations. Knowledgeable leaders can navigate the complexities of technology adoption, champion innovation, and guide their organizations through the transition to new systems and processes.

The fact that coercive pressures had no effect on blockchain adoption within financial sector in Turkey highlights the need for regulations. This finding could inform policymakers about the current inadequacy of coercive pressures in driving blockchain adoption. It suggests the need for clearer, more robust regulatory frameworks that either encourage or mandate the adoption of blockchain, thereby influencing organizational behavior more effectively.

In addition to that, understanding the influence of normative pressures can help in designing effective implementation strategies for blockchain technology. Efforts to promote blockchain adoption can focus on enhancing industry-wide education, fostering professional networks, and highlighting success stories from leading organizations.

Highlighting that within the financial sector in Turkey there is no actual use of blockchain technology, despite its robust applications such as cryptocurrency, organizations need to identify and address the barriers that prevent the transition from intention to actual use. This could involve investing in infrastructure, training, and change management processes. Providing targeted support and resources for the implementation phase can help organizations move from intention to action. This might include technical assistance, regulatory guidance, and strategic consulting. Establishing mechanisms to monitor and evaluate the progress of blockchain initiatives can help organizations stay on track and address issues promptly as they arise.

6.5 Limitations and Future Directions

The study is limited to private organizations in the financial sector within Turkey. This narrow focus may limit the generalizability of the findings to other regions, countries, or sectors with different regulatory, economic, and cultural contexts. The financial sector has unique regulatory and competitive dynamics, which may not be applicable to other industries. Thus, the findings may not fully translate to sectors with different technological and operational characteristics.

Moreover, the sample size, while adequate for the study, may not be representative of all private financial organizations in Turkey. This could limit the robustness of the findings and their applicability to the broader population of organizations. Also, there may be a response bias, as the study relies on self-reported data from decision-makers who might have varying levels of understanding or interest in blockchain technology. This could influence the reliability of the responses. However, it was struggling to collect data from managers at the top-level management, which in some way limited the reach to top management views and perceptions regarding blockchain adoption.

While risk's negative effect was not supported in this study, it provides valuable insights into the factors driving blockchain adoption within the private Turkish organizations in the financial sector. The results of the research highlight the importance of understanding the specific drivers of technology adoption in different contexts. Future research could explore other institutional pressures, such as coercive (regulatory) and normative (professional) pressures, to see

if they have a more significant impact on blockchain adoption. Also, Future research could explore additional factors that may influence adoption intentions, such as organizational readiness, technological capabilities, or external pressures.

Finally, expanding research to include various sectors beyond finance, such as healthcare, manufacturing, and logistics, can reveal sector-specific adoption drivers and barriers. This would help tailor strategies for blockchain adoption in different industries. Conducting comparative studies across different countries can provide insights into how cultural, regulatory, and economic contexts influence blockchain adoption. This can help generalize findings and develop more universally applicable models.

6.6 Conclusions

In conclusion, this research has successfully identified the factors influencing the adoption of blockchain technology within organizations, with a particular focus on those in the private sector. The study has examined various elements that drive decision-makers to embrace blockchain technology in their organizations. One of the key insights gained from this research is the role of FOMO (Fear of Missing Out) in the decision-making process. It also highlighted the fact of relatively low actual use of blockchain technology in private financial organizations in Turkey.

Moreover, the analysis revealed that organizational leaders are not only motivated by the technical and economic benefits of blockchain technology but also by the perceived pressure to adopt it due to fear of being left behind by competitors. This psychological factor, FOMO, emerged as a crucial determinant in the adoption process, suggesting that decision-makers are influenced by the broader market trends and peer actions within their industry.

Furthermore, the study highlighted several other adoption factors, including perceived benefits, innovativeness, decision makers' knowledge, and external pressures. These factors collectively shape the decision-making landscape for blockchain adoption in the private sector. The findings emphasize the importance of a holistic approach, considering both rational and psychological factors when analyzing technology adoption in organizations.

By shedding light on these dynamics, this research contributes to a deeper understanding of the complexities involved in blockchain adoption. It underlines the need for decision-makers to balance technical evaluations with an awareness of market perceptions and competitive pressures. The insights provided by this study can serve as a valuable guide for organizations contemplating the integration of blockchain technology, helping them to make informed and strategic decisions.

Finally, Future research could build on these findings by exploring how these adoption factors vary across different industries and organizational sizes, as well as by investigating the long-term impacts of FOMO-driven decisions on organizational performance and innovation.

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APPENDIX A

Turkish version of the survey

Genel Bilgiler

Cinsiyetiniz:	Kadin () Erkek ()
Eğitim durumunuz:	Lise () Önlisans () Lisans () Yüksek Lisans () Doktora ()
Çalıştığınız kurumun türü:	Kamu () Özel ()
Profesyonel iş deneyiminiz: (yıl)	
Çalıştığınız kurumunuzda kaç çalışanınız var?	
Hangi yönetim kademesında çalışıyorsunuz?	Üst kademe yönetim () Orta kademe yönetim () Alt kademe yönetim ()
Çalıştığınız kurum hangi sektörde faaliyet göstermektedir?	Lojistik Ve Tedarik Zinciri() Sağlık() Finans() Diğer_____
Çalıştığınız kurumda yeni teknolojilerin benimsenmesi ile ilgili karar verme sürecine ne sıklıkla katılıyorsunuz?	Herzaman() Sık sık() Bazen() Nadiren() Hiçbir zaman ()

Bu ankette yer alan ifadeler, şu anda çalışmakta olduğunuz kuruma ilişkindir. Aşağıdaki ölçeği kullanarak lütfen her ifadeye katılım durumunuza göre seçeneklerden birini işaretleyiniz.

1= **Kesinlikle Katılmıyorum** 2= **Katılmıyorum** 3=**Kararsızım** 4=**Katılıyorum** 5= **Kesinlikle Katılıyorum**

Bence, kurumlar şu durumlarda blockchain'i benimseyecektir:

RS1	Blockchain teknolojisi kullanılırken işlemlerin bilgileri ele geçirilirse
RS2	Blockchain teknolojisi beklenen faydalarını sağlamazsa
RS3	Blockchain güvenli değilse
TR1	Çalıştığım kurum, Blockchain teknolojisini uygulamaya karar vermeden önce ücretsiz bir deneme blockchain uygulamasına erişebilir.
TR2	Çalıştığım kurum blockchain uygulamasını büyük bir ölçekte kullanma kararını vermeden önce birçok blockchain uygulamasını kullanma şansına sahiptir
TR3	Çalıştığım kurum, blockchain teknolojisi'nin gerçek potansiyelini görmeye yetecek kadar uzun zamandır blockchain teknolojisi kullanmaktadır
TR4	Bir blockchain paketini test ettikten sonra deneme sürecinden çıkmak kolaydır.
TR5	Blockchain teknolojisini kullanmanın başlangıç maliyeti düşüktür.
RA1	Blockchain kullanımı, kurumdaki müşterilere hizmet verme süresinin verimliliğini arttırır
RA2	Blockchain kullanımı, kurumdaki operasyonel maliyetlerin verimliliğini arttırır
RA3	Blockchain kullanımı, işleri yaparken zaman kazandırır
RA4	Blockchain kullanımı, kurumumdaki genel giderleri azaltır.
INV1	Orijinal fikirleri olduğunda

INV2	Var olan bir şeyi geliştirmektense yeni bir şey yaratmayı tercih ettiklerinde
INV3	Genellikle işleri farklı şekilde yapma riskini aldıkları zaman
INV4	Genellikle eski sorunlara karşı yeni bir bakış açısına sahip olduklarında
DMK1	Benzer pozisyonlardaki diğer insanlara kıyasla kendi blockchain bilgimi çok iyi olarak değerlendiririm.
DMK2	Bilgi sistemleri anlayışımla ilgili olarak, blockchain teknolojisi uygulamasını uygulamanın kurumum üzerindeki etkilerinin farkındayım.
DMK3	Blockchain deneyim seviyem (Yok, Az, Orta, İyi, Çok İyi)
FO1	Yeni blockchain teknolojisini deneyimlemediğimde endişeli hissediyorum
FO2	Yeni blockchain teknolojisini deneyimlemediğimde, Çalıştığım kurumdaki diğer kişilere kıyasla geride kaldığıma inanıyorum.
FO3	Endişeli hissediyorum çünkü blockchain teknolojisine sahip olma fırsatını kaçırmanın önemli bir şey olduğunu biliyorum
FO4	Başka kısıtlamalar Nedeniyle yeni blockchain teknolojisine sahip olamazsam üzülürüm.
FO5	Yeni blockchain teknolojisi kullanma şansını kaçırırsam pişman olurum.
sFO6	Blockchain teknolojisi kullanmazsak rakiplerimiz ve ortaklarımız bizim kurumumuzu önemsemez
sFO7	Yeni blockchain teknolojimiz olmadığında kurumumuz çevreye uyum sağlayamaz
sFO8	Yeni blockchain teknolojisini uygulama şansını kaçırdığımızda, kurumumun rakipler/ortaklar tarafından dışlandığını düşünüyorum.
sFO9	Yeni blockchain teknolojisi uygulama şansını kaçırdığımızda, kurumumun rakipler/ortaklar tarafından göz ardı edildiğini hissediyorum.
CVP1	Çalıştığım kurum, blockchain teknolojisini uygulamak için rakip baskısı yaşıyor.
CVP2	Blockchain teknolojisi uygulanmasaydı, çalıştığım kurum rekabet açısından dezavantajlı bir durum yaşayacaktı.
CVP3	Çalıştığım kurumun rakipleri blockchain teknolojisini büyük ölçüde kullanmaktadır
CV1	Devlet, kurumumuzun blockchain teknolojisini uygulamasını şart koşuyor
CV2	Sektör, kurumumuzun blockchain teknolojisini uygulamasını şart koşuyor
CV3	Kurumumuzun müşterileri, kurumumuzun blockchain teknolojisini uygulamasını istiyor.
NP1	Müşterilerimizin çoğu blockchain teknolojisini kullanır
NP2	Tedarikçilerimizin çoğu blockchain teknolojisini kullanır
NP3	Meslek kuruluşlarının (ticaret/sanayi dernekleri) blokchain teşviki, kurumunuzu blockchain teknolojisini kullanması için etkiledi
INT1	Kurumum, gelecekte blockchain teknolojisini kullanmayı düşünüyor
INT2	Kurumum, muhtemelen gelecekte blockchain teknolojisini kullanacak
INT3	Kurumum, gelecekte erişimleri olduğunda blockchain teknolojisini kullanacaktır.
BU1	Blockchain teknolojisi şu anda kuruluşumda kullanılıyor
BU2	Blockchain teknolojisi kuruluşumda sıklıkla kullanılıyor