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Original Research

The Pattern of Blockchain Technology Deployment Requirements in the Developing Accounting Industry

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Abstract

In the accounting position, there has been a great deal of spotlight on the utilization of blockchain innovation, particularly in developing countries, where apparently remarkable assumptions ought to be acknowledged in the near future. The objective of this study is to recognize the prerequisites that should be met for the effective execution of blockchain innovation in developing nations. Our study was directed with regard to Iran, a developing nation. A qualitative research method (thematic method) was employed for this study, with the statistical population comprising blockchain, information technology, and accounting specialists in Iran. By using purposeful and snowball sampling techniques, we collected a total of 20 samples. We conducted semi-structured interviews to gather data for later analysis. The result of this study revealed that IT infrastructure, institutional, social, strategic, and organizational requirements are all crucial prerequisites for the successful deployment of blockchain technology in the accounting industry in developing countries. The study offers a blockchain implementation roadmap for the accounting industry.

Keywords: Accounting industry, blockchain, developing countries, information technology.

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Introduction

Data innovation offices have recently become increasingly important (Kale, Gimekar, Tamboli, Patil, & Pawar, 2023). As one of the new advancements in data innovation, blockchain is no exception (Zhang, Shi, Pan, 2022). Today, we see the utilization and development of this innovation in different ventures, for example, in monetary and bookkeeping-related industries (Tran, 2022). Blockchain is an innovation that records information through a framework that cannot be changed or replicated (Liang, Ruan, Xu, & Liu, 2022). It has been utilized for quite a while (Kim, Park, & Kim, 2022). Blockchain is a carefully designed, straightforward, and secure circulated record innovation that can change the bookkeeping business (Supriadi, Harjanti, Suprihandari, & et al., 2020).

The innovation is excellent for recording monetary exchanges since it decreases extortion and mistakes. This innovation can diminish costs and provide more straightforwardness and security in accounting (Akram, 2017). It likewise empowers quicker and more effective exchanges and constant examination. An investigation discovered that blockchain innovation could diminish monetary administration framework costs by US$15–20 billion annually by 2022 (Shahi, 2020). Moreover, it disposes of Manual record keeping, considering more accurate and advanced records (Rahman, Kabir, Ahmed, & et al., 2020). Additionally, blockchain could save the accounting business up to $100 billion annually by 2025 (Hakim, Toledo, & Laksmi, 2022). Accordingly, due to the importance of blockchain innovation in the accounting business, it is necessary to constantly pay attention to the essentials for the foundation of reference innovation (Hakim & Bahari, 2021). With the aim that it may be done correctly. However, developing countries facing banning conditions face different requirements for blockchain foundations in the accounting business (Pandey & Gilmour, 2023). Focusing on countries like Iran can help organizers and strategy makers understand the mentioned innovations. The majority of studies on identifying the necessary conditions for blockchain adoption in the accounting industry have concentrated on industrialized and developed nations (Francisco & Swanson, 2018; Kokina, Mancha, & Pachamanova, 2017; Singh, Haque, Kaphle & et al., 2021). A limited amount of blockchain prerequisite study has been conducted in developing countries. (Kumar, Srivastava, & Singh, 2022). Also, they have not considered all the parts of blockchain prerequisites in developing countries like Asia with limitations. Therefore, in this way, like any emerging innovation, blockchain additionally requires prerequisites for its use and foundation (Cornea, 2022). Paying attention to these requirements can stimulate a better and faster organization of the mentioned innovations. Also, this issue is more evident in non-industrial countries like Iran with social restrictions (sanctions). Also, considering the need of the day to use the advancements of Propulsion, this study aims to understand the needs of blockchain in accounting with financial verification in countries. The ongoing review aims to fill the gap in the literature by exploring the critical factors for the successful adoption of blockchain technology in the accounting industry in developing countries, particularly Iran. The remainder of this work is structured as follows: Section 2 reviews prior relevant reviews. Section 3 displays the study methodology's structure regarding data collection and analysis methodologies. In Section 4 of our report, we present findings that clarify the classifications we have made. Section 5 not only compares the findings of our review to relevant literature but also suggests some theoretical implications. Lastly, in Section 6,

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we conclude our study by acknowledging its limitations and proposing some areas for further research.

Theoretical background

In this section, according to Table 1, several studies will be reviewed in the field of blockchain requirements in the accounting industry. In a study conducted in 2021 by Betül Şeyma Alkan, the researchers aimed to use blockchain technology in accounting and financing information systems and tax systems. This study talks about how blockchain innovation functions, its fundamental qualities, and how it could improve bookkeeping and monetary systems' proficiency, straightforwardness, and security. This study found that increased transparency, audibility, and real-time tracking of transactions were beneficial and challenging in Turkey.

In a 2022 study by Al-Zaqeba, Jarah, Ineizeh, & et al, by evaluating the impacts of blockchain quality and managers' bookkeeping procedures, the researchers hoped to explore the possible influence of blockchain innovation on store network abilities. To do this, the designers ran a comprehensive written survey, revealing that blockchain innovation will likely irritate production network administrators. However, they point out that blockchain innovation's full potential will not be achieved until board and accounting standards are updated to take advantage of this new invention. In a 2020 study by Gupta, Shukla, Rao, & et al., researchers aimed to investigate a framework for financial auditing using blockchain technology and identity-based cryptography. In this research, which refers to Dubai, the results showed that blockchain technology and identity-based cryptography could improve financial auditing significantly after challenges such as the non-standard security of the blockchain network and the scalability of blockchain networks.

In a 2019 study by Gurtu & Johny, researchers aimed to provide a comprehensive literature review of blockchain technology. Researchers also reviewed its potential implications for supply chain management. According to this research conducted in India, blockchain technology is rapidly penetrating many industries. It has tremendous potential to eliminate intermediaries and make SCM more efficient. In a study conducted in 2022 by Bellucci, Cesa Bianchi, & Manetti, the researchers aimed to perform a methodical examination of the present academic status of the investigation into blockchain for accounting, scrutinize how blockchain will revolutionize accounting and business practices, and recognize forthcoming research tendencies linked to blockchain for accounting.

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Table 1. Theoretical background

Requirement of blockchain in accounting	Result	Year	Developed country	Reference
Transparency Immutability Auditability	Reduced risk of fraud Improved efficiency Enhanced transparency	2022		(Zhou & Sun, 2022)
Distributed ledger Immutability Transparency	Reduced risk of fraud Improved efficiency Enhanced transparency	2022	+	(Wu & Zhou, 2022)
Data security consensus mechanism Distributed ledger	Increased security Increased transparency Improved efficiency	2018		(Yu, Lin & Tang, 2018)
Security Immutability Scalability Interoperability transparency	Improve security Increase efficiency improving transparency	2016	+	(Brandon, 2016)
There is a need for further research on the technical and organizational challenges of implementing blockchain in accounting	Blockchain has the potential to improve efficiency transparency and security of accounting processes	2016	+	(Bahga & Madisetti, 2016)

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Requirement of blockchain in accounting	Result	Year	Developed country	Reference
security Immutability Scalability Interoperability transparency	Increase efficiency improving transparency improving security	2019	+	(Casado-Vara &. Corchado, 2019)
Data security Cost saving Data transparency	Increased data security and integrity Increase transparency Reduce costs Improved collaboration	2017		(Dai & Vasarhelyi, 2017)
Data security Data integrity Data transparency	Increased efficiency Reduced risk of fraud Enhanced transparency Improved audit quality	2022	+	(Abdennadher, Grassa, Abdulla & et al., 2021)
Data security Data integrity Data transparency	Increased efficiency Reduced risk of fraud Enhanced transparency Improved audit quality	2021		(Perera & Abeygunasekera, 2022)
Data security Data integrity Data transparency	Improved tax compliance Increased efficiency Reduced risk of fraud Enhanced transparency	2021	+	(Grundel, Zhuravleva, Mandroshchenko, & et al., 2021)

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So far, studies have yet to be presented to provide a model for accounting industry service requirements. This is with a focus on blockchain facilities. Most studies worldwide focus on blockchain's consequences in the accounting industry. Most of these studies have been conducted in developed countries or address limited aspects of blockchain implementation requirements in the accounting industry. It was created to fill this research gap and pave the way for planning and policymaking. This was done to develop blockchain technology in the accounting industry.

Methodology

This experimental study was conducted using the structuralism paradigm. This study aims to determine blockchain requirements in the accounting industry in developing countries. Providing practical applications and future innovative programs also illustrates the use of inductive thinking. Also, the paradigm of structuralism allows us to consider different parts of the accounting system and their cooperation with blockchain innovation. In addition, data analysis was done based on Braun and Clark's six-step work technique (Braun & Clarke, 2006). It is like viewing a jigsaw puzzle with many components. Examining the fascinating pieces, their relationships, and how they interact can provide more excellent knowledge of how they work together. It is simpler to grasp the situation if the issue is seen holistically. Consequently, better coordination and potential arrangements will be possible. It can be used in different areas, for example, decisive reasoning, direction, goal setting, and imaginative thinking.

Data collection and participants

The data gathering tools in this study to analyze blockchain requirements in accounting were semi-structured interviews with accounting, blockchain, and information technology professionals surveyed in Iran, a developing country. They had a master's or doctorate in relevant subjects. They had done a study in the field of information technology in finance, or blockchain in finance. In addition, they had employment experience in domains linked to information technology and blockchain. Finance had at least four years of experience. Table 2 shows the demographic information of interview participants.

Table 2. demographic information about participants

Participant	Sector	Educational level	Position of the interviewer	Experience of the interviewer
P1	Tax accounting	PhD	Faculty member	7
P2	Information technology	PhD	Government	5
P3	Accountant	MSc	Accountant	8
P4	Information technology	PhD	IT Security Engineer	6
P5	Internal auditing	MSc	Government	4
P6	Accountant	PhD	Faculty member	9
P7	Information technology	PhD	IT manager	7

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Participant	Sector	Educational level	Position of the interviewer	Experience of the interviewer
P8	Government	PhD	Software engineer	5-7
P9	Financial analysis	MSc	Bank	11
P10	Management Accounting	PhD	Faculty member	13
P11	Healthcare Accounting	MSc	Hospital	4-6
P12	Government	PhD	Blockchain Developer	5
P13	Government	MSc	Blockchain Consultant	4
P14	Banking Accounting	MSc	Accountant	4-5
P15	Government	PhD	Software Engineer	12
P16	Insurance accounting	PhD	Faculty member	14
P17	Information technology	PhD	IT Support Analyst	9
P18	Government Accounting	PhD	Faculty member	14
P19	Information technology	MSc	Blockchain Developer	4-6
P20	Management Accounting	PhD	Faculty member	12

After evaluating related studies and sources, interview questions were ready in the main stage. Then, utilizing the semi-structured interviews. In these semi-structured interviews, specialists were furnished with questions connected with blockchain impacts in bookkeeping.

- What are the advantages and disadvantages of this technology?

- What are the challenges and practical solutions for implementing blockchain in the accounting industry?

- What are the prerequisites for blockchain deployment in Iran's accounting industry?

- Can Special economic conditions, such as sanctions, create different requirements for blockchains in the accounting industry?

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Data analysis

By analyzing the data obtained from the interviews, the patterns, requirements, and needs for blockchain implementation in the accounting industry in developing countries were identified. These analyses were conducted qualitatively, and the extracted results were presented using thematic analysis methods (Braun & Clark, 2006).

Finally, by combining qualitative data obtained from interviews and analysis, an operational description of the requirements of the blockchain revolution in accounting countries was presented. This operational description includes key concepts, implementation solutions, and requirements necessary to implement this revolution in accounting. By utilizing purposeful and snowball sampling methods, the number of samples for our qualitative study was not determined, and the interviews will continue until the categories are saturated. However, we reached category saturation when we reached the 18th interview, and no new category was found. Therefore, we conducted two more interviews to ensure the work was done correctly. This resulted in a total of twenty interviews. Maxqda20 software was used to facilitate data analysis.

Lastly, we applied Lincoln and Cuba's (1985) qualitative study validation criteria. Credibility, reliability, transferability, and confirmability are among these characteristics. According to Table 3, the introduced criteria validated the validity of the applied qualitative technique.

Table 3. Validation of the qualitative method

Criterion	Activities
Credibility	Setting aside enough time to read and comprehend the material Using the peer review approach Assisting the researcher in the field of information technology management
Dependability	There were two groups of researchers in the study. The first researcher coded once, while the second oversaw the research implementation procedure and its outcomes.
Transferability	Other developing countries can benefit from the research findings.
Confirmability	The personal viewpoints of the researcher are not allowed to intrude. A researcher from outside the research team reviews the results at the end of the study.

Result

For analysis, we used Braun and Clark's thematic analysis method. Table 4 shows the results of the thematic analysis. The primary codes can be seen in the appendix. The theme analysis is based on Brown and Clark's six steps: In the phase of getting to know the data, first, the available sources, which are the same results obtained from the semi-structured interviews, were reviewed several times to understand the content thoroughly. Then, During the initial coding stage, the hidden patterns of the data, which were attractive and

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extractable from the study's point of view and included 85 initial basic theme codes, were discovered from the text of the interviews. In the next step, incomplete or duplicate codes in the interview transcript were removed, and 60 selective codes were obtained. In the next step, the basic codes analyzed in the previous step were categorized and arranged into three comprehensive organizing and central sections. In the last stage, the themes were reviewed and assessed again to define global themes. As a result, in this section, five global themes for requirements were identified, including infrastructure, Institutional, social, strategic, and organizational requirements. The following table and theme network Figure 1 shows the essential, organizing, and global themes to identify blockchain implementation requirements in the accounting industry in different countries.

Table 4. Research findings

Participants	Basic theme	Organizing theme	Global theme
P1,P8,P20,P17,P19,P18,P16	Internet access	Technical equipment is present	Information technology infrastructure requirements
P2, P18,P20,P6,P8	Use virtual private networks		
P8,P1,P11,P19	Hardware and equipment		
P3,P9,P16,P20,P8	Software and equipment		
P8,P5,P17	Data storage equipment		
P19,P12,P17,P18,P8	Rapid information processing equipment		
P18,P4,P8	Authentication and encryption	Establish security	
P10,P14,P8,P18,P15	Security of online systems		
P3,P18,P15,,P13,P8,P6	Transaction and information security		
P1,P11,P10,P20,P8	Privacy protection		
P8,P17,P12,P20,P18	Secure and cloud communication network		
P8,P1,P16,P10,P19	Electronic signature		
P17,P10,P11,P8,P19,P18,P20	Artificial intelligence		

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Participants	Basic theme	Organizing theme	Global theme
	algorithms for error detection		
P6,P19,P12,P14,P15	Complying with accounting principles and standards	Compilation of standards	Institutional requirements
P7,P11,P15,P18	Compliance with the principles and standards of blockchain interactions		
P8,P10,P15	Compilation of updated principles and standards		
P13,P17,P6,P15	Development of financial transaction standards		
P20,P15	Drafting amendments to financial and accounting laws	Compilation of rules and regulations	
P18,P20,P11,P16,P15	Amendment of e-commerce laws		
P15,P20,P18	Realization of information technology government		
P15,P19,P17,P10	Data protection laws		
P10,P15,P20,P18,P17,P13	The legal status of contracts concluded on the blockchain platform		
P11,P20,P18,P17,P13	Training of service providers	Education and Awareness	
P18,P19,P20,P13	Training and informing users		

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Participants	Basic theme	Organizing theme	Global theme
P13,P19	Consolidation of existing concepts		Social requirement
P16,P14,P9,P17,P13	Transparency of the work steps		
P19,P4,P5,P13,P15	International Experts' Cooperation	Cooperation	
P13,P14,P6,P19,P20	Determine responsibilities transparently		
P1,P20,P17,P13	Sharing knowledge and experiences		
P14,P18,P13,P15	Existence of an environment that supports cooperation changes between employees		
P20,P18,P13	Presentation of joint projects		
P15,P17,P16,P13,P5	Using other countries' experiences		
P17,P13	Academic participation		
P3,P15,P17	Confidence in the new service style		
P17,P18,P20,P3,P11	Investment in infrastructure	investment	Strategic requirements
P11,P20,P18,P17	Investment in education		
P12,P20,P17,P5,P11	Investment in security		
P17,P18,P20,P8,P7,P11,P2	Providing cryptocurrency		
P6,P19,P14,P9,P11,P18,P20	Investment in attracting cooperation		

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Participants	Basic theme	Organizing theme	Global theme
P4,P17,P11,P7,P19	The need for blockchain feasibility	Research and development	
P18, P11,P14,P17	Investigation and research into different aspects of the problem		
P11,P14,P17	Conducting prospective research		
P8, P6,P17,P11,P12,P18	Investigation and research to remove obstacles and limitations		
P13,P10,P14,P19,P16,P11	The body overseeing services and transactions	Supervision	
P14,P11,P17	Independent experts in each unit related to the blockchain field		
P15, P11,P18,P11,P20	An authoritative body to confirm activities		
P1, P20,P4,P5,P3,P17,P11	An accurate information recording and monitoring system		
P19,P10,P18,P11,P20	Developing a new strategy	Managerial	Organizational requirements
P5,P20,P3,P15,P17,P9	Alignment of blockchain research perspectives with organizations' mission		

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Participants	Basic theme	Organizing theme	Global theme
P18,P10,P20,P9,P15	delegation of authority and responsibilities		
P20, P8,P15,P9,P2,P19,P17	change of organizational structures,		
P9,P18,P19,P6,P7,P1,P13	Creating a cooperation network between different departments		
P14,P19,P7,P6,P15,P9,P20	Development of organizational processes for sending reports		
P20,P4,P8,P9	Integration of internal accounting systems with blockchain	Integration	
P11,P9,P11,P20,P19	Integration and consistency with other information systems		
P16,P17,P18	Integration of the Mohabdar system with the blockchain		

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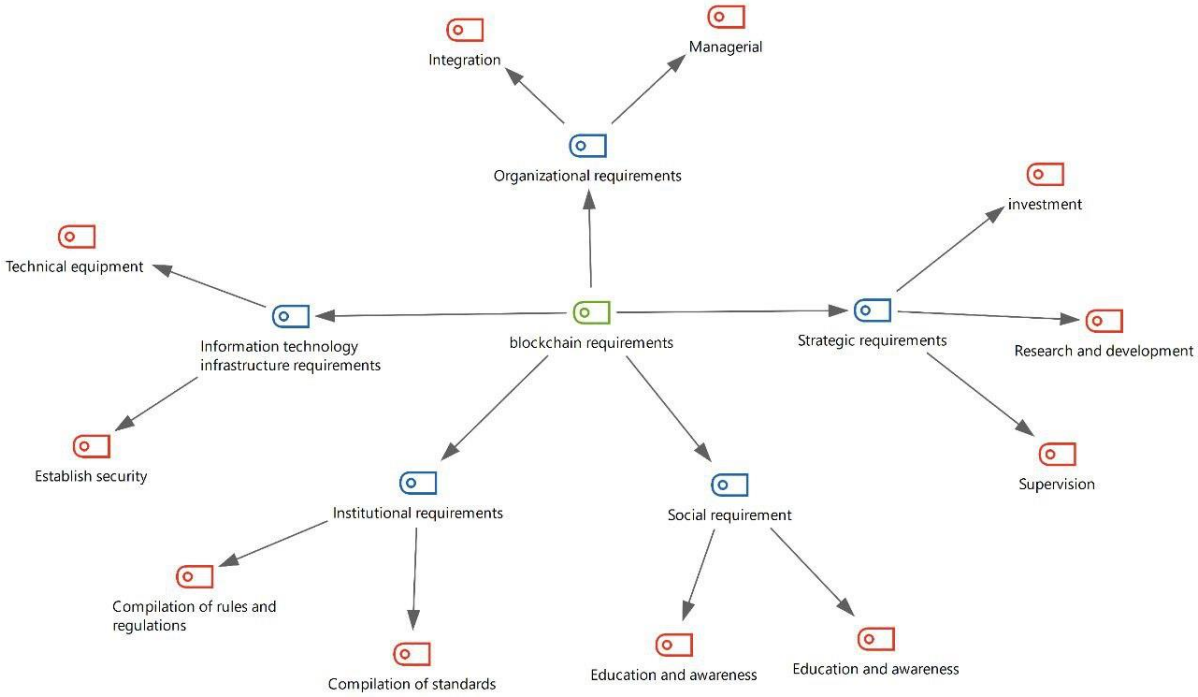

Figure 1. The theme network of blockchain requirements in accounting

The theme network of blockchain requirements in accounting Figure 1 shows the various pieces of a blockchain framework. This innovation, known as a dispersed record, has the capacity to keep exchanges safe and straightforward.

Discussion

In this section, based on the research in the previous section, the results have been analyzed and reviewed. We compared the results obtained with previous studies.

Information Technology Infrastructure Requirements

One of the essential prerequisites for stimulating innovation in developing countries is the arrangement of specialized bases in data and correspondence innovation (Ramanathan, Chacko, & Andrlic, 2022). Due to the prevalence of significant digital divide and limited connectivity in these countries (Solarz & Adamek, 2023), As shown in the 8th session of this review, "Developing countries without reliable internet access and secure networks cannot fully trust blockchain technology." The types of foundation requirements can be divided into two categories: technical requirements, which relate to the equipment and programming expected to implement a framework, and performance requirements, which relate to the methodology and strategies expected to deal with the framework (Plekhanova & Vinogradova, 2020).

Although it is essential to consider the security requirements for acquiring a system separately, it is crucial to understand that technical requirements involve hardware components such as firewalls. Meanwhile, functional requirements concentrate on the

processes and approaches for acquiring the system. For instance, consider client authentication and access control measures (Wu, 2022).

The Institutional Requirements

One of the fundamental issues to focus on to implement and use blockchain in accounting business in non-industrialized countries is to focus on the institutional prerequisites (Alfian, Ritchie, Adrianto, & et al., 2021). This prerequisite type refers to fundamental changes in improving guidelines and core values for innovation. In addition, issues, for example, changes in regulations and guidelines to reflect new management practices, are seen in these organizational prerequisites (Olander, Vanhala, & Hurmelinna-Laukkanen, & et al., 2016). During the 15th meeting, "One of the central questions that we should focus on is to approve the approved regulations and to choose in the context of the transformation of the foundation and coordination issues such as the development of regulations and guidelines." This is because regulations and guidelines must be updated to reflect advanced changes in aid delivery, such as digitization. Also, the foundation must be set to make these improvements accurately and constructively (Sheffield, Jacobs, & Ellis, 2022). In addition, coordination between the various partners involved in the aid transfer process should be arranged to ensure that all parties work together to achieve the ideal outcome. Such an arrangement of guidelines and frameworks does not produce more or less random results (Kandpal, Das, Misra, & et al., 2022). Public authorities must carefully prepare and implement to ensure the new frameworks are adequately regulated. Public authorities must also provide essential assets and prepare officials to implement the new frameworks to ensure a positive outcome. They also need to ensure that the necessary framework is in place to support the new principles. Finally, they must change depending on the situation to ensure the new frameworks are workable and proficient (Borghoff, Pfeiffer, & Rödig, 2022).

Social Requirements

One of the primary issues to focus on when implementing and using blockchain in accounting businesses in developing countries is to focus on the social prerequisites. This prerequisite type refers to fundamental changes in improving guidelines and core values for innovation (Pugna & Duțescu, 2020). In addition, issues, such as changes in regulations and guidelines to reflect new management practices, are seen in these organizational prerequisites. As stated in the 13th meeting, "Through proper training in the utilization of blockchain technology for financial transfers in institutions, a large number of groups of people can confidently participate in its effective use." This is because regulations and guidelines must be updated to reflect advanced changes in aid delivery, such as digitization. Also, the foundation must be set to make these improvements accurately and constructively (Al-Zaqeba & Jarah, Ineizeh & et al., 2022).

Furthermore, coordination among the many partners participating in the assistance transfer process should be established to ensure that all parties work together to obtain the best possible result. Such an arrangement of guidelines and frameworks does not produce more or less random results. This requires careful preparation and implementation by public authorities to ensure that the new frameworks are regulated and work properly (Uduji, 2016). Public authorities must also provide essential assets and

prepare officials to implement the new frameworks to ensure a positive outcome. They also need to ensure that the necessary framework is in place to support the new principles. Finally, they must change depending on the situation to ensure the new frameworks are workable and proficient (Vikhrova, Hradziushka, & Gorlova, 2022).

Strategic Requirements

Another critical requirement for blockchain implementation in the accounting business is the creation of strategic prerequisites. This type refers to the need for significant-level issues, for example, obtaining essential capital and exploring and directing innovative work practices. As mentioned at the 11th meeting, "one of our problems is legally presenting digital forms of money." The essential requirements of countries like Iran in agriculture are considered extremely basic. These requirements can be divided into three categories: Management of subsidies for innovative works (Sanjari & Tabesh, 2014).

Research and development financing forms the main category. This requires financing from private and public sources, including investments and government awards (Olvido & Sanchez, 2018). The next class leads to study and development activities. This includes managing progress interactions and ensuring access to critical assets to perform ideal tasks (Rahardja, Aini, & Maulana, 2021). The third classification is legitimate compatibility. This includes ensuring compliance with relevant regulations and guidelines when conducting cryptocurrency activities. This means ensuring all transactions are routed within the legal system, and all necessary permits are obtained. Likewise, it involves staying alert to legal developments. Additionally, it needs to track all transactions and ensure that this information is secure (Labunska, Serikova, & Sobakar, 2021).

Organizational Requirements

One of the significant requirements for organizations in developing countries is adopting blockchain technology. As service providers, organizations must provide the basis for acceptance of this technology. As stated in the 9th interview, "Organizations in this situation need to change their structures because they have to move towards flexibility. In this way, they can also use the opinions of the employees. The result of this is the reduction of employee resistance." Therefore, organizational requirements can be divided into two general categories: management factors, such as developing an effective strategy. This procedure ought to consider the particular requirements of the association. It should also consider the potential benefits and risks of blockchain technology or changes in organizational structures (Derhachova, Ogynskyiy, & Shchemur, 2022). This is to restructure their departments and divisions. For example, they may need to create new departments or divisions to manage blockchain systems. In addition, they may need to merge existing departments that are no longer necessary.

A mix of interior bookkeeping frameworks with blockchain alludes to the most common way of interfacing an association's current bookkeeping frameworks with a blockchain network (Derhachova, et al., 2022). This allows the organization to store its accounting data on the blockchain, which improves accounting security, transparency, and efficiency (Sarwar, Iqbal, Alyas, & et al., 2021).

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Additionally, combination and similarity with other data frameworks allude to a blockchain organization's capacity to cooperate with other data frameworks (Malik, Mittal, Mavaluru, & et al., 2023). This includes ERP systems, CRM systems, and supply chain management systems. This permits associations to share information across various frameworks, which can improve their proficiency and adequacy (Chong, 2021). The theoretical validity of the research results can be seen in Table 5.

Table 5. Theoretical validation

Previous studies	Findings		
(Bahga & Madisetti, 2016)	Use virtual private networks	Technical equipment is present	Information technology infrastructure requirements
	Data storage equipment		
(Zhou & Sun, 2022)	Secure and cloud communication network	Establish security	
	Security of online systems		
(Gupta et al., 2020)	Development of financial transaction standards	Compilation of standards	Institutional requirements
	Complying with accounting principles and standards		
(Yu, Lin, &, Tang, 2018)	Data protection laws	Compilation of rules and regulations	
	Realization of information technology government		
(Abdennadher et al, 2021)	Training of service providers	Education and Awareness	Social requirement
	Consolidation of existing concepts		
(Perera & Abeygunasekera, 2022)	Sharing knowledge and experiences	Cooperation	
	Using other countries' experiences		
(Bellucci et al., 2022)	Investment in infrastructure	Investment	Strategic requirements
	Investment in education		

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Bellucci et al., 2022)	Conducting prospective research	Research and development	
	The need for blockchain feasibility		
(Zaqeba et al., 2022)	An accurate information recording and monitoring system	Supervision	
	An authoritative body to confirm activities		
(Wu & zhou, 2022)	change of organizational structures,	Managerial	Organizational requirements
	delegation of authority and responsibilities		
(Zaqeba et al. 2022)	Integration of internal accounting systems with blockchain	Integration	
	Integration and consistency with other information systems		

Our research has uncovered a need for more attention to technical equipment, security measures, standards, regulations, training, awareness, collaboration, investment, research and development, management, monitoring, integration, and work dimensions. These parts need to be given more attention in past discoveries. Our discoveries have been creative and have added to existing information progress.

Conclusion

In recent years, emphasis has been placed on the necessity of information technology in accounting in developing countries. The demand for it has grown. Based on this, the study aimed to identify the requirements for blockchain in the accounting industry in developing countries. We used a qualitative approach, involving the statistical community of information technology specialists and collecting 20 semi-structured interviews based on purposeful and snowball sampling methods. Thematic analysis was also employed to collect and assess the data. The results showed that information technology must be established in the accounting industry. The study focused on the information technology infrastructure and organizational, social, and strategic requirements to implement the research. The study faced limitations, such as needing more blockchain experts in countries with economic sanctions. According to research findings, the study also found a need for more access to international blockchain information due to economic sanctions.

The following suggestions are made for the following researchers and also for the development of the research path:

- Understanding the digital divide in developing countries: Evaluating and designing the implementation of robust security methods. It is like VPN encryption to deal with the challenges of the digital divide between countries. This is done so that they have complete transparency for blockchain use.

- Investigating Blockchain Solutions for Developing Country: investigating and analyzing the practical methods of education and increasing transparency at every level of society, as well as promoting the use of blockchain technology in accounting for people and institutions in developing countries, to speed up and increase transparency in work processes, and to eliminate resistance to exploitation, From blockchain to the next stage of acceleration and transparency in work processes It is recommended to conduct research as the next step in studying this field.

- Security Measures in Governmental Online Services: The evaluation of governmental information technology initiatives' efficacy entails analyzing governmental websites and online services. This comprehensive analysis necessitates a comparison of the usability, security, and scalability of these digital platforms.

- Understanding Data Analysis in Education: To examine educational data to evaluate various investment strategies is known as analysis. Analysis refers to disintegrating something, such as data, into smaller components to gain better comprehension. In the present context, assessing different investment strategies refers to scrutinizing the data to discern which investment plans would yield the highest success.

- Establishing Regulatory Frameworks for Effective Implementation: Inquiry into the optimal procedures for international collaboration in blockchain for development reveals that exemplary methodologies encompass the establishment of regulatory frameworks that guarantee the appropriate implementation of blockchain technology, the creation of a milieu that fosters innovation, the cultivation of collaboration among diverse stakeholders, and the promotion of education and training to ensure the correct application of the technology.

References

Akram, W. (2017). Blockchain Technology: Challenges And Future Prospects. *International Journal of Advanced Research in Computer Science*, 8, 642-644. doi:https://doi.org/10.26483/IJARCS.V8I9.4950.

Al-Zaqeba, M. A. A., Jarah, B. A. F., Ineizeh, N. I., Almatarneh, Z., & Jarrah, M. A. A. (2022). The effect of management accounting and blockchain technology characteristics on supply chains efficiency. *Uncertain Supply Chain Management*. doi:https://doi.org/10.5267/j.uscm.2022.2.016.

Alkan, B. Ş. (2021). Real-time Blockchain accounting system as a new paradigm. *Muhasebe ve Finansman Dergisi*, 41-58. doi:https://doi.org/10.25095/mufad.950162.

Alfian, A., Ritchi, H., Adrianto, Z., Setiono, K., & Sugianto, L. (2021). Construct Identification on Blockchain Implementation in Emerging Accounting and assurance Domain. *Indonesian Journal of Business and Entrepreneurship (IJBE)*, 7(1), 82-82. doi:http://dx.doi.org/10.17358/IJBE.7.1.82.

Abdennadher, S., Grassa, R., Abdulla, H., & Alfalasi, A. (2022). The effects of blockchain technology on the accounting and assurance profession in the UAE: an exploratory study. *Journal of Financial Reporting and Accounting*, 20(1), 53-71. doi:https://doi.org/10.1108/JFRA-05-2020-0151

Braun, V., & Clarke, V. (2006). *Using thematic analysis in psychology*. Qualitative Research in Psychology, 3(2), 77-101. doi:10.1191/1478088706qp063oa.

Borghoff, U. M., Pfeiffer, E., & Rödig, P. (2022). Long-term lifecycle-related management of digital building documents: towards a holistic and standard-based concept for a technical and organizational solution in building authorities. *Proceedings of the 22nd ACM Symposium on Document Engineering*. doi:https://doi.org/10.1145/3558100.3563842.

Bellucci, M., Cesa Bianchi, D., & Manetti, G. (2022). Blockchain in accounting practice and research: systematic literature review. *Meditari Accountancy Research*. doi:https://doi.org/10.1108/medar-10-2021-1477.

Bahga, A., & Madisetti, V. K. (2016). Blockchain Platform for Industrial Internet of Things. *Journal of Software Engineering and Applications*, 09, 533-546. doi:https://doi.org/10.4236/JSEA.2016.910036.

Brandon, D. (2016). The blockchain: The future of business information systems. *International Journal of the Academic Business World*, 10(2), 33-40.

Chong, K. C. (2011). A middleware integrating ERP, CRM and supply chain management system using service oriented architecture. *(Unpublished doctoral dissertation). University Malaya, Kuala Lumpur.*

Cornea, A.-A. (2022). Prerequisites of a blockchain-oriented technique to assure a digital management of products recall caused by notified issues in food industry. *Proceedings of the International Conference on Business Excellence*, 16, 1246 - 1258. doi:https://doi.org/10.2478/picbe-2022-0114.

Casado-Vara, R., & Corchado, J. (2019). Distributed e-health wide-world accounting ledger via blockchain. *Journal of Intelligent & Fuzzy Systems*, 36(3), 2381-2386. https://doi.org/10.3233/JIFS-169949

Dai, J., & Vasarhelyi, M. A. (2017). Toward blockchain-based accounting and assurance. *Journal of information systems*, 31(3), 5-21. doi:https://doi.org/10.2308/isys-51804

Derhachova, H., Ogynskyiy, O. S., & Shchemur, V. Y. (2022). The Role Of Management Factors In The Concept Of The Diversification Strategy Of The Enterprise's Foreign Economic Activities. *Scientific Opinion: Economics And Management*. Doi:Https://Doi.Org/10.32782/2521-666x%2F2022-80-8.

Fabe, A. P. H., Toledo, J. A., & Laksmi, S. (2022). The Growth of Financial Technology in Indonesia: Implications for Terrorism Financing. *International Annals of Criminology*, 60, 162 - 181. doi:https://doi.org/10.1017/cri.2022.16.

Francisco, K., & Swanson, D. (2018). The supply chain has no clothes: Technology adoption of blockchain for supply chain transparency. *Logistics*, 2(1), 2. doi:https://doi.org/10.3390/logistics2010002

Gupta, R., Shukla, V. K., Rao, S. S., Anwar, S., Sharma, P., & Bathla, R. (2020). Enhancing privacy through "smart contract" using blockchain-based dynamic access control. *Paper presented at the 2020 International Conference on Computation, Automation and Knowledge Management (ICCAKM).* https://doi.org/10.1109/ICCAKM46823.2020.9051521

Gurtu, A., & Johny, J. (2019). Potential of blockchain technology in supply chain management: a literature review. *International Journal of Physical Distribution & Logistics Management*, 49(9), 881-900. doi:https://doi.org/10.1108/IJPDLM-11-2018-0371.

Grundel, L. P., Zhuravleva, I. A., Mandroshchenko, O. g. V., Kniazeva, A. V., & Kosenkova, Y. Y. (2021). Applications of Blockchain in Taxation: New Administrative Opportunities. *Webology*. doi:https://doi.org/10.14704/web%2Fv18si04%2Fweb18139

Hakim, T., & Bahari, M. (2021). Blockchain Technology Research in Business, Management and Accounting Field: A Bibliometric Analysis. 2021 7th *International Conference on Research and Innovation in Information Systems (ICRIIS)*, 1-7. doi:https://doi.org/10.1109/ICRIIS53035.2021.9616980.

Kandpal, M., Das, C., Misra, C., Sahoo, A. K., Singh, J., & Barik, R. K. (2022). Blockchain assisted Supply Chain Management System for Secure Data Management. *2022 International Conference on Advancements in Smart, Secure and Intelligent Computing (ASSIC)*, 1-6. doi:https://doi.org/10.1109/ASSIC55218.2022.10088404

Kale, P. M. S., Gimekar, A., Tamboli, Z., Patil, V., & Pawar, A. (2023). Survey on Blockchain Cryptocurrency Wallet. *International Journal of Advanced Research in Science, Communication, and Technology*. doi:https://doi.org/10.48175/ijarsct-8910

Kim, Y., Park, B., & Kim, S.-Y. (2022). A selective encryption/decryption method of sensitive music usage history information on theme, background and signal music blockchain network. *Journal of Web Engineering*, 1265–1282-1265–1282. doi:https://doi.org/10.13052/jwe1540-9589.21411.

Kokina, J., Mancha, R., & Pachamanova, D. A. (2017). Blockchain: Emergent Industry Adoption and Implications for Accounting. *Journal of Emerging Technologies in Accounting*, 14, 91-100. doi:https://doi.org/10.2308/JETA-51911.

Kumar, A., Srivastava, S. K., & Singh, S. (2022). How blockchain technology can be a sustainable infrastructure for the agrifood supply chain in developing countries. *Journal of Global Operations and Strategic Sourcing*. doi:https://doi.org/10.1108/jgoss-08-2021-0058.

Lincoln, Yvonna S. & Guba, Egon G. (1985). *Naturalistic inquiry*. Beverly Hills, Calif: Sage Publications.

Liang, X., Ruan, W., Xu, Z., & Liu, J. (2022). Analysis of Safe Storage of Network Information Data and Financial Risks Under Blockchain Combined With Edge Computing. *Journal of Global Information Management*. doi:https://doi.org/10.4018/jgim.312580.

Labunska, S., Serikova, T., & Sobakar, M. (2021). Approaches to and Methodological Basis of Accounting for Intangible Assets Generated in Cryptocurrency. *The Problems of Economy*, 2, 225-235. doi:https://doi.org/10.32983/2222-0712-2021-2-225-235

Malik, V., Mittal, R., Mavaluru, D., Narapureddy, B. R., Goyal, S., Martin, R. J., . . . Mittal, A. (2023). Building a Secure Platform for Digital Governance Interoperability and Data Exchange using Blockchain and Deep Learning-based frameworks. *IEEE Access*. doi:https://doi.org/10.1109/ACCESS.2023.3293529 Olvido, M. M & Sanchez.(2017). Government spending vis-à-vis business enterprise investments on research and development. CNU-Journal of Higher Education, 11, 13-27.

Olander, H., Vanhala, M., Hurmelinna-Laukkanen, P., & Blomqvist, K. (2016). Preserving prerequisites for innovation: Employee-related knowledge protection and organizational trust. *Baltic Journal of Management*, 11, 493-515. doi:https://doi.org/10.1108/BJM-03-2015-0080.

Perera, P. A., & Abeygunasekera, A. W. J. C. (2022). Blockchain Adoption in Accounting and Auditing: A Qualitative Inquiry in Sri Lanka. *Colombo Business Journal*. doi:https://doi.org/10.4038/cbj.v13i1.89.

Pugna, I. B., & Duțescu, A. (2020). Blockchain – the accounting perspective. *Proceedings of the International Conference on Business Excellence*, 14, 214 - 224. doi:https://doi.org/10.2478/picbe-2020-0020.

Plekhanova, S. V., & Vinogradova, N. A. (2020). Analysis of the requirements of normative and technical documentation for piling equipment. *IOP Conference Series: Materials Science and Engineering*, 911. doi:https://doi.org/10.1088/1757-899X%2F911%2F1%2F012021.

Pandey, D., & Gilmour, P. M. (2023). Accounting meets metaverse: navigating the intersection between the real and virtual worlds. *Journal of Financial Reporting and Accounting.* doi:https://doi.org/10.1108/jfra-03-2023-0157.

Rahman, M. N., Kabir, R., Ahmed, Z., Hamid, M. A., & Mridha, M. F. (2020). DxChain: Blockchain Based Smart and Indestructible Diagnosis Reporting System. *Social Science Research Network.* doi:https://doi.org/10.2139/ssrn.3563381.

Ramanathan, H. N., Chacko, P. S., & Andrlic, B. (2022). Global Diffusion of Innovation: An Empirical Comparison. *Wseas Transactions On Business And Economics*. doi:https://doi.org/10.37394/23207.2022.19.31.

Rahardja, U., Aini, Q., & Maulana, S. (2021). Blockchain Innovation: Current and Future Viewpoints for the Travel Industry. *IAIC Transactions on Sustainable Digital Innovation (ITSDI).* doi:https://doi.org/10.34306/itsdi.v3i1.499.

Sarwar, M. I., Iqbal, M. W., Alyas, T., Namoun, A., Alrehaili, A., Tufail, A., & Tabassum, N. (2021). Data Vaults for Blockchain-Empowered Accounting Information Systems. *IEEE Access*, 9, 117306-117324. doi:https://doi.org/10.1109/ACCESS.2021.3107484.

Solarz, M., & Adamek, J. (2023). Trust and Personal Innovativeness as the Prerequisites for Using Digital Lending Services Offered by FinTech Lenders. *Annales Universitatis Mariae Curie-Skłodowska, sectio H – Oeconomia*. doi:https://doi.org/10.17951/h.2023.57.1.197-218.

Shahi, H. S. A. S. P. S. P. (2020). Blockchain Based Service Providers Payment Methodology. International. *Journal of Innovative Technology and Exploring Engineering*. doi:https://doi.org/10.35940/ijitee.e2908.039520.

Supriadi, I., Harjanti, W., Suprihandari, M. D., Prasetyo, H. D., & Muslikhun. (2020). Blockchain Innovation and Its Capacity to Enhance the Quality From Accounting Information Systems. *International Journal of Scientific Research and Management*. doi:https://doi.org/10.18535/ijsrm%2Fv8i02.em05.

Sheffield, S. W., Jacobs, M., & Ellis, C. (2022). Considerations for the Over-the-Counter Hearing Aid Delivery Model. *Perspectives of the ASHA Special Interest Groups*. doi:https://doi.org/10.1044/2022_persp-22-00058.

Sanjari, S., Tabesh, A., & loyeh, H.R. (2014). Investigation of the impact of energy consumption on added value in agriculture sector in Iran. *Journal of Applied Environmental and Biolegal Sciences*, 4(1), 38-42.

Singh, K., Haque, A., Kaphle, S., & Joowon Ban, J. (2021). Distributed ledger technology - Addressing the challenges of assurance in accounting systems: A research note. *Journal of Accounting and Management Information Systems*. doi:https://doi.org/10.24818/jamis.2021.04004.

Tran, V., Barton, M., Bumblauskas, D., & Mann, A. (2021). Blockchain Applications: SME Interviews and Financial & Banking Use Case. *Faculty Publications*. 2167. https://scholarworks.uni.edu/facpub/2167

Uduji, I. E. (2016). Donor Coordination and Health Aid Effectiveness in the Nigerian Health Sector. *Walden Dissertations and Doctoral Studies*. 2510.https://scholarworks.waldenu.edu/dissertations/2510

Vikhrova, O., Hradziushka, A., & Gorlova, I. S. (2022). Digital Information Openness of Public Authorities in Russia and Belarus. *2022 Communication Strategies in Digital Society Seminar (ComSDS)*, 55-61. doi:https://doi.org/10.1109/comsds55328.2022.9769133.

Wu, X. (2022). Special Issue on Advanced Network Security: Methods and Applications. *Mobile Networks and Applications*, 27(4), 1337-1338. doi:https://doi.org/10.1007/s11036-022-01983-x

Wu, C., & Zhou, Z.-J. (2022). The Impact of Digital Currency on Accounting and Management under the Blockchain Architecture. *International Journal of Education and Humanities*. doi:https://doi.org/10.54097/ijeh.v5i3.2440.

Zhou, W., & Sun, M. (2022). Accounting Cyber Security Based on Blockchain. Paper presented at the *2022 IEEE Asia-Pacific Conference on Image Processing, Electronics and Computers (IPEC).* doi: 10.1109/IPEC54454.2022.9777549.

Yu, T., Lin, Z., & Tang, Q. (2018). Blockchain: The Introduction and Its Application in Financial Accounting. *Journal of Corporate Accounting & Finance*. doi:https://doi.org/10.1002/JCAF.22365.

Zhang, X., Shi, X.-H., & Pan, W. (2022). Big Data Logistics Service Supply Chain Innovation Model Based on Artificial Intelligence and Blockchain. *Mobile Information Systems.* doi:https://doi.org/10.1155/2022%2F4794190.

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Original Research

Modelling Consumer Price Index in Tanzania: Holt Winter's Approach

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Abstract

Consumer price index (CPI) is a socioeconomic statistic that tracks changes over time in the average price of consumer goods and services such as household purchases of fuel, transportation, food and so on that consumers buy, use, or pay for. The purchasing power of everyone is impacted by rising costs, especially if salaries stay the same. Our ability to purchase more things with our TZS reduces when the CPI increases more quickly than earnings, which has an impact on our cost of living. The aim of this study is to use the CPI monthly data from IMF website for the period from Jan 2010 to Dec 2022 to develop a forecasting model by using Holt Winter's approach. Holt Winter's model based on four equations and popularly known as Triple exponential smoothing is commonly used in forecasting data with trends and seasonality. Holt Winter's model is composed of four equations relating to level, trend, seasonal and forecast. The results revealed that the Holt winter's model with smoothing parameters, 0.9 for level, 0.12 for trend, and 0.03 for seasonal was the best model in forecasting Consumer Price Index. The CPI for Tanzania is predicted for the next eighteen months and it has been observed that the trend of CPI is likely to increase in the next eighteen months.

Keywords: CPI, forecasting, IMF, model.

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Introduction

Consumer price index (CPI) is a socioeconomic statistic that tracks changes over time in the average price of consumer goods and services such as household purchases of fuel, transportation, food and so on that consumers buy, use, or pay for (Shinkarenko et al., 2021). The purchasing power of everyone is impacted by rising costs, especially if salaries stay the same. Our ability to purchase more things with our shillings reduces when the CPI increases more quickly than earnings, which has an impact on our cost of living (Zhang, 2023). The CPI is a crucial economic indicator since it serves as a potential indicator of future economic issues. Rising inflation has an impact on the central bank's policy rate and raises lending interest rates. Knowing the CPI's long-term trends is crucial for creating a strong and resilient economy (Iftikhar, 2013).

Forecasting CPI is a crucial field of study since it aids in understanding the trend of the consumer price index and how it influences several financial decisions. Investors desire accurate inflation estimates since the returns on stocks and bonds completely depend on the path of inflation (Lidiema, 2017). Businesses use inflation estimates to plan their production schedules and establish prices for their goods and services. When precise forecasting results aid in the development of future government policies, forecasting becomes an important tool in the corporate sphere (Corpin et al., 2023). For a number of economic factors, including efficiency, financial markets, and monetary policy, it is critical to accurately estimate the change in the CPI (Wanto et al., 2018). Furthermore, the general public, decision-makers, and academics will place a great deal of importance on developing a reliable and precise CPI forecasting model (Rohmah et al., 2021).

The rising CPI indicates that the cost of goods and services is rising. Without forecasting CPI, it is impossible to predict future inflation rates, which makes it difficult for lenders to set loan terms and is bad for the economy. This would result in customers having less purchasing power. Additionally, consumers with lower incomes must spend a larger percentage of their income on basic necessities. Furthermore, the trade-off between unemployment and inflation may suffer in the public and private sectors. In this matter, predicting consumer price index in Tanzania is crucial for avoiding these negative effects. Therefore, the objective of this research is to forecast consumer price index in Tanzania by using a double exponential model.

Statement of the problem

Autoregressive Integrated Moving Average(ARIMA) model is widely applied in econometrics and time series analysis. While this model offers valuable insights and have proven effective in many applications, it has certain limitation and challenges. It is unable to deal with complex dynamics or nonlinear interactions, such as rapid shocks or regime changes in the time series (Ospina et al., 2023).

Researchers and practitioners often address these limitations by using different models, exploring hybrid approaches, or incorporating additional techniques to improve forecasting accuracy and capture the complexities of real-world data. Exponential smoothing models are relatively robust against isolated outliers or temporary shocks in

the data. The weighted averaging nature of exponential smoothing assigns less weight to extreme observations, which helps dampen the impact of outliers on the forecasts. This study aims to address this gap by applying exponential smoothing models to forecast consumer price index in Tanzania.

Literature Review

Numerous Studies have been carried out for the CPI forecast analysis. The ideal model for Consumer price index prediction, however, has not yet been agreed upon by researchers.

Shinkarenko et al., (2021) in his study examined the trend of the consumer price index in Ukraine for the period from January 2010 to September 2020. He tried to model the behavior of the consumer price index and forecast for the next months, two types of models were used: the additive ARIMA*ARIMAS model, better known as the model of Box-Jenkins and the exponential smoothing model with the seasonality estimate of Holt-Winters. As a result of using the STATISTICA package, the most adequate models were built, reflecting the monthly dynamics of the consumer price index in Ukraine. The inflation forecast was carried out on the basis of the Holt-Winters model, which has a minimum error.

In order to develop a forecasting model, (Arindam Banerjee, 2021) utilized monthly time series data on Consumer Price Index (CPI) in India and the Box-Jenkins auto regressive integrated moving average (ARIMA) technique. The ARIMA (1,1,5) model was identified in this study as the best one for CPI prediction in India. The model was evaluated using monthly data from the first of January 2019 to the first of January 2020. The Consumer Price Index is predicted to grow at a rate of 6.67% by the model, whereas the actual CAGR of the CPI during the validation period was 6.68%.

Nnamdi et al. (2022) compared some time series models using the monthly Consumer Price Index (CPI) of consumer goods in Nigeria. The data used for the study was the monthly CPI of all items from January 2009 to January 2021, sourced from the National Bureau of Statistics (NBS). The CPI was computed using November 2009 as the base period. The study seeks to obtain the time series model that best fits the data to make more accurate forecasts from the series. Of the four models considered in the study, the double exponential smoothing model was found to be the best model for the monthly CPI and was therefore employed to make an 18-month forecast of the series.

A study on inflation was conducted in Kenya using 180 monthly data values by Uwilingiyimana et al. (2015). The findings showed that the ARIMA (1, 1, 12) model was better able to anticipate the data based on the stationarity test and historical trends than the GARCH (1, 2) model. He continued by showing that, when compared to past forecasting methods, the model generated the best results and markedly improved estimate and forecasting accuracy.

Molebatsi & Raboloko (2016) applied an autoregressive integrated moving average for modeling consumer price index (CPI) in Botswana. He enhanced the model by incorporating the generalized autoregressive conditional heteroscedasticity

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(ARCH/GARCH) model that accounts for volatility in the time series. In the course of analysis, CPI was predicted using the two models, ARIMA (1, 1, 1) and ARIMA (1, 1, 1) + GARCH (1, 2), and the predicted CPI was compared to the actual CPI. Since their 95 percent confidence intervals covered the real CPI, both models performed well in terms of forecasting. When error terms were examined for normality, minor differences were discovered that supported the inclusion of the ARCH/GARCH components. The study also demonstrates that CPI volatility in Botswana was low, as evidenced by the low values of its ARCH/GARCH components.

In the case of Tanzania, Nyoni (2019) used ARIMA to forecast the inflationary trend. He discovered that the ARIMA models (1, 1, 2) had a better forecasting accuracy. According to Ngailo et al. (2014) who studied inflation using time series models with data from January 1997 to December 2010, the GARCH (1, 1) model was the most useful for forecasting inflation in Tanzania.

Research Methodology

Research design

Longitudinal research design is a research approach that involves studying the same sample or group of individuals over an extended period. It aims to examine changes, trends, or developments that occur within the sample over time, allowing researchers to understand the dynamic nature of various phenomena (Ali & Mahgoub, 2020). In addition, longitudinal research designs provide valuable insights into the dynamics of various phenomena over time, offering a rich understanding of individual and group-level changes, development, and causal processes (Kelikume & Salami, 2014).

Data

This study will utilize monthly consumer price index data for the period from January 2010 to December 2022 from the IMF website. R software was used for the analysis and model building.

Single exponential Smoothing

Single exponential smoothing is a time series forecasting method used to make predictions based on the weighted average of past observations. It is a simple and widely used technique for forecasting future values in a time series, especially when the data does not exhibit complex patterns or seasonality (Prapcoyo & As'ad, 2022).

The single exponential smoothing method assigns exponentially decreasing weights to past observations, with the most recent observations given more weight than the older ones (Lidiema, 2017). The formula for calculating the forecast using single exponential smoothing is shown by (1) as:

$$F(t+1) = \alpha Y(t) + (1 - \alpha) F(t) \quad (1)$$

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Where: F(t+1) is the forecast for the next time period (t+1), Y(t) is the actual observation at time t, F(t) is the forecast for the current time period (t) and α is the smoothing factor or smoothing parameter ($0 < \alpha < 1$).

The smoothing factor, α, determines the weight given to the most recent observation versus the previous forecast. A higher α places more emphasis on recent data, making the forecast more responsive to recent changes. Conversely, a lower α gives more weight to historical data, making the forecast more stable and less responsive to recent fluctuations (Muhammed et al., 2019).

Double exponential smoothing

Double exponential smoothing approach, also known as Holt's method, is an extension of single exponential smoothing that incorporates trend information in addition to level (or average) information. It is a popular time series forecasting technique used to make predictions for data with a trend but no seasonal patterns (Mohamed, 2020).

In double exponential smoothing, there are two components: the level component (denoted as L) and the trend component (denoted as T). The level component represents the average value of the time series, while the trend component captures the direction and rate of change of the series (Nnamdi et al., 2021). The forecast at time t+1 is calculated using (2), (3) and (4):

Level equation:

$$L(t) = \alpha Y(t) + (1 - \alpha)\,(L(t-1) + T(t-1)) \quad (2)$$

Trend equation:

$$T(t) = \beta(L(t) - L(t-1)) + (1 - \beta)\,T(t-1) \quad (3)$$

Forecast equation:

$$F(t+k) = L(t) + k(T(t)) \quad (4)$$

Y(t) is the actual observation at time t, L(t) is the level component at time t, T(t) is the trend component at time t, α is the smoothing factor for the level component ($0 < \alpha < 1$), β is the smoothing factor for the trend component ($0 < \beta < 1$), k is the number of periods ahead for the forecast.

Double exponential smoothing technique provides more accurate forecasts than single exponential smoothing for time series data with trends. However, it still assumes that the trend is linear and does not handle seasonal patterns (Ali & Mahgoub, 2020). For data with complex trends or seasonal variations, more advanced methods such as triple exponential smoothing or seasonal methods like Holt-Winters can be used (Lidiema, 2017).

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Triple exponential smoothing

Triple Exponential Smoothing (TES) is used to forecast time series data that exhibit trend and seasonality. It consists of three components: the level component, the trend component, and the seasonal component. The method uses three smoothing factors: α for the level component, β for the trend component, and γ for the seasonal component (Prapcoyo & As'ad, 2022). The formulas for calculating the forecast, level, trend, and seasonal components in Triple Exponential Smoothing are as represented as follows:

For the additive model, the equations are shown by (6), (7), (8) and (9);

Level equation:

$$L(t) = \alpha (Y(t) - S(t-L)) + (1 - \alpha) (L(t-1) + T(t-1)) \quad (5)$$

Trend equation:

$$T(t) = \beta (L(t) - L(t-1)) + (1 - \beta) T(t-1) \quad (6)$$

Seasonal equation:

$$S(t) = \gamma (Y(t) - L(t)) + (1 - \gamma) S(t-L) \quad (7)$$

Forecast equation:

$$F(t+k) = L(t) + k (T(t)) + S(t-L+k) \quad (8)$$

For the multiplicative model, the equations are (9), (10), (11) and (12);

Level equation:

$$L(t) = \alpha (Y(t)/S(t-L)) + (1 - \alpha) (L(t-1) + T(t-1)) \quad (9)$$

Trend equation:

$$T(t) = \beta (L(t) - L(t-1)) + (1 - \beta) T(t-1) \quad (10)$$

Seasonal equation:

$$S(t) = \gamma (Y(t)/L(t)) + (1 - \gamma) S(t-L) \quad (11)$$

Forecast equation:

$$F(t+k) = (L(t) + k (T(t))) S(t-L+k) \quad (12)$$

Y(t) is the actual observation at time t, L(t) is the level component at time t, T(t) is the trend component at time t, S(t) is the seasonal component at time t, L is the length of the seasonal cycle, k is the number of periods ahead for the forecast and α, β, and γ are the smoothing factors for the level, trend, and seasonal components, respectively.

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Triple Exponential Smoothing technique is a more advanced method than double exponential smoothing as it takes into account both trend and seasonality. It is particularly useful for forecasting data with recurring seasonal patterns (Efrilia, 2021).

Mean Absolute Error

Mean Absolute Error (MAE) is a commonly used metric to evaluate the accuracy of a forecasting model. It measures the average absolute difference between the predicted values and the actual values. The lower the MAE, the better the model's performance (Aabeyir, 2019). The absolute errors for each data point are obtained by subtracting the predicted value from the actual value and taking the absolute value as follows

$$MAE = (1/n) \Sigma (|A - P|)$$

Where n is the total number of data points, A is the actual values and P is forecasted values.

Mean Squared Error

Mean Squared Error (MSE) is another commonly used metric to evaluate the accuracy of a forecasting model. It measures the average of the squared differences between the predicted values and the actual values. The lower the MSE, the better the model's performance (Prapcoyo & As'ad, 2022).

$$MSE = (1/n) \Sigma ((A - P) ^2$$

n is the total number of data points; A is the actual values and P is forecasted values. obtain a metric that is more interpretable and in the same unit as the original data, you can consider taking the square root of the MSE, which results in the Root Mean Squared Error (RMSE) (Ali & Mahgoub, 2020). The RMSE is often used as an alternative to the MSE and provides a measure of the average deviation in the original unit of the data.

Mean Absolute Percentage Error

Mean Absolute Percentage Error (MAPE) is a commonly used metric to evaluate the accuracy of a forecasting model, particularly when dealing with relative errors. It measures the average percentage difference between the predicted values and the actual values. The lower the MAPE, the better the model's performance (Nnamdi et al., 2021). Divide the sum of absolute percentage errors by the total number of data points to obtain the mean:

$$MAPE = (1/n) \Sigma (|A - P| / A) * 100$$

n is the total number of data points; A is the actual values and P is forecasted values. The MAPE provides a measure of the average percentage deviation between the predicted and actual values. It is especially useful when the magnitude of the errors relative to the actual values is important for analysis (Mia, 2019).

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Results

The trend of consumer price index

The historical CPI index data is plotted in Figure 1 from January 2000 to December 2022. Given that the series has an overall increasing trend and a seasonal component, the triple exponential model is appropriate since it captures the trend and seasonality that exists in the CPI index data. Shows

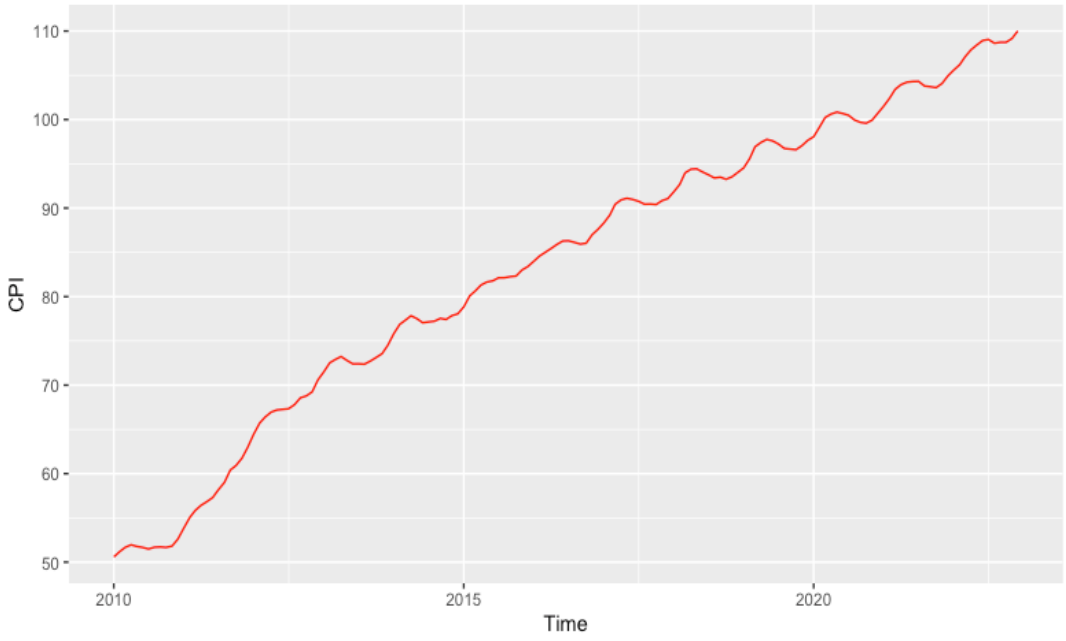

Figure 1: Consumer Price Index

In this case, three equations have to be fitted, level, trend and seasonal with α, β and γ as smoothing parameters respectively.

Selection of smoothing parameters

In order to choose the best smoothing parameters, the trial-and-error method was used. In this procedure of choosing a smoothing parameter, 0.9, 0.12 and 0.03 were determined to be the optimum smoothing parameters for α, β and γ respectively as shown in table 1.

The best model was chosen based on the lowest values generated by various measurements of accuracy chosen, which are MAE and RMSE, as shown in table 1. This model, which can be used to estimate the future values, has values of 0.9 for level, 0.12 for trend, and 0.03 for seasonal. These parameters had a small error (RMSE (0.3034468), MAPE (0.3011188)) when compared to other smoothing constants.

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Table 1. Triple exponential smoothing parameters

Smoothing constant, α (Level)	Smoothing constant, β (Trend)	Smoothing constant, γ (Seasonal)	RMSE	MAPE
0.7	0.12	0.01	0.3429642	0.3435283
0.8	0.15	0.03	0.3185002	0.3166101
0.95	0.1326	0.0418	0.3044733	0.3163559
0.7	0.15	0.02	0.3403631	0.3422364
0.8	0.1	0.01	0.3223489	0.3209479
0.9	0.12	0.03	0.3034468	0.3011188
0.7	0.1	0.03	0.3501002	0.3508799
0.8	0.12	0.02	0.3208185	0.3189957
0.9	0.1	0.02	0.305141	0.3013425

Table 2 displays the predicted values for the upcoming 18 months, which are totally inflated by their convergence and indicates the overall trend.

Table 2. CPI predictions for the next 18 months

Month	Point forecast	Lo 95	Hi 95
Jan 2023	110.9050	110.2750	111.5349
Feb 2023	111.9801	111.0480	112.9123
Mar 2023	112.9092	111.6997	114.1187
Apr 2023	113.4644	111.9837	114.9451
May 2023	113.6329	111.8802	115.3855
Jun 2023	113.5368	111.5084	115.5653
Jul 2023	113.5014	111.1916	115.8112
Aug 2023	113.3245	110.7270	115.9220
Sep 2023	113.5484	110.6563	116.4406
Oct 2023	113.6290	110.4350	116.8230
Nov 2023	114.2010	110.6979	117.7041
Dec 2023	114.9209	111.1013	118.7405
Jan 2024	115.8159	111.6621	119.9696
Feb 2024	116.8910	112.4069	121.3752
Mar 2024	117.8201	112.9981	122.6420
Apr 2024	118.3753	113.2083	123.5422
May 2024	118.5438	113.0246	124.0630
Jun 2024	118.4477	112.5693	124.3262

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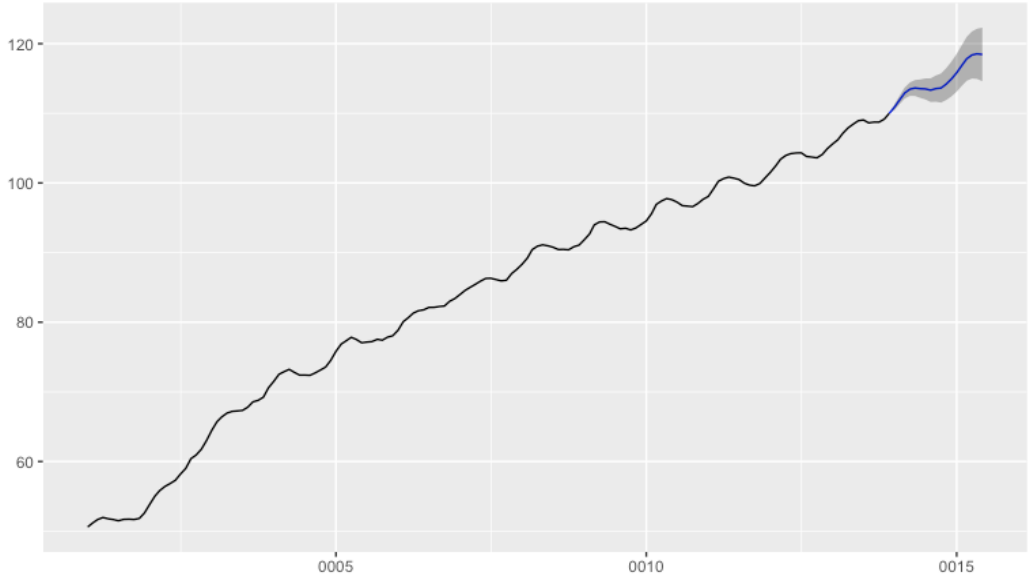

Figure 2. Forecasted CPI index values

The predicted values are shown in Figure 2 for the next 18 months, and it is clear that the Tanzania CPI will tend to rise in a positive direction.

Discussion

According to previous research, Nyoni (2019) used the ARIMA model to accurately estimate CPI, whereas Ngailo et al. (2014) determined that the GARCH model was the best one for forecasting the CPI and rising prices. Based on the internal consistency of the smoothing model, which is illustrated by a low mean square error, the Holt Winter's approach provides a better forecast. The accuracy of the prediction model is demonstrated by this study by the predicted values, which are much closer to the actual values. The findings of this study are consistent with prior studies conducted by Aabeyir (2019) and Efrilia (2021). They discovered that compared to other forecasting approaches, double or triple exponential smoothing can produce more accurate findings.

Conclusion and Recommendation

Conclusion

Based on the results and discussion in this study, Holt Winter's approach is the most suitable model to forecast the CPI values in the short and long runs. According to Holt Winter's forecasting model, the CPI is likely to rise over the next 18 months. Prediction models typically work better over shorter time spans and their accuracy declines over time because, it is difficult to anticipate human behavior for the long run. This limitation exists naturally in all mathematical models of human consumption behavior. The results revealed that the holt winter's model with smoothing parameters 0.9 for level, 0.12 for trend, and 0.03 for seasonal was the best model in forecasting Consumer Price Index

Recommendation and area for further studies

The current study has important implications for real life as well. The government should employ fiscal measures like interest rate ceilings, lower government expenditure, and sustainable taxes to manage inflation since the Consumer Price Index (CPI) is rising.

To enhance the forecast of the consumer price index, future research may examine hybrid models like SARIMA and machine learning algorithms such as Support Vector Regressor (SVR) and Random Forest Regressor (RFR). The SVR model includes more predictors of consumer price index like interest rates and taxes to account for additional variability in the commodity prices.

References

Aabeyir, B. (2019). Forecasting The Consumer Price Index Of Ghana Using Exponential Smoothing Methods. *Mathematical Theory and Modeling*.

Ali, A., & Mahgoub, A. (2020). Prediction of CPI in Saudi Arabia: Holt's Linear Trend Approach. *Research in World Economy*, *11*(6), 302. https://doi.org/10.5430/rwe.v11n6p302

Arindam Banerjee. (2021). *Forecasting Price Levels in India—An Arima Framework*. *25*(1).

Corpin, S. J. T., Marbella, J. N. P., Kua, S. J. J., Mabborang, R. C., & Lamprea, C. T. (2023). Forecasting Inflation Rate in the Philippines Using Seasonal Autoregressive Integrated Moving Average (SARIMA) Model. *European Journal of Computer Science and Information Technology*, *11*(2), 13–36. https://doi.org/10.37745/ejcsit.2013/vol11n21336

Efrilia, I. (2021). Comparison of ARIMA and Exponential Smoothing Holt-Winters Methods for Forecasting CPI in The Tegal City, Central Java. *Jurnal Ekonomi Pembangunan*, *19*(02), 97–106. https://doi.org/10.22219/jep.v19i02.18040

Iftikhar, N. (2013). *Forecasting the Inflation in Pakistan; The Box-Jenkins Approach*.

Kelikume, I., & Salami, A. (2014). *Time Series Modeling and Forecasting Inflation: Evidence From Nigeria*. *8*(2).

Lidiema, C. (2017). Modelling and Forecasting Inflation Rate in Kenya Using SARIMA and Holt-Winters Triple Exponential Smoothing. *American Journal of Theoretical and Applied Statistics*, *6*(3), 161. https://doi.org/10.11648/j.ajtas.20170603.15

Mia, S. (2019). *Modelling and Forecasting the Consumer Price Index in Bangladesh through Econometric Models*. *59*(1).

Mohamed, J. (2020). Time Series Modeling and Forecasting of Somaliland Consumer Price Index: A Comparison of ARIMA and Regression with ARIMA Errors.

American Journal of Theoretical and Applied Statistics, *9*(4), 143. https://doi.org/10.11648/j.ajtas.20200904.18

Molebatsi, K., & Raboloko, M. (2016). Time Series Modelling of Inflation in Botswana Using Monthly Consumer Price Indices. *International Journal of Economics and Finance*, *8*(3), 15. https://doi.org/10.5539/ijef.v8n3p15

Muhammed, K. A., Bolarinwa, F. A., & Ajao, I. O. (2019). *Exponential Smoothing Methods In Forecasting Nigeria Consumer Price Index*.

Ngailo, E., Luvanda, E., & Massawe, E. S. (2014). Time Series Modelling with Application to Tanzania Inflation Data. *Journal of Data Analysis and Information Processing*, *02*(02), 49–59. https://doi.org/10.4236/jdaip.2014.22007

Nnamdi, E., Odunayo, B. J., Olawale, A. I., & Olurin, A. (2021). *Comparative Study Of Some Time Series Models On The Monthly Consumer Price Index (Cpi) Of Consumer Goods In Nigeria*.

Nyoni, T. (2019). *Modeling and forecasting inflation in Tanzania using ARIMA models*. https://mpra.ub.uni-muenchen.de/92458/

Ospina, R., Gondim, J. A. M., Leiva, V., & Castro, C. (2023). An Overview of Forecast Analysis with ARIMA Models during the COVID-19 Pandemic: Methodology and Case Study in Brazil. *Mathematics*, *11*(14), 3069. https://doi.org/10.3390/math11143069

Prapcoyo, H., & As'ad, M. (2022). The Forecasting Of Monthly Inflation In Yogyakarta City Uses An Exponential Smoothing-State Space Model. *International Journal of Economics, Business and Accounting Research (IJEBAR)*, *6*(2), 800. https://doi.org/10.29040/ijebar.v6i2.4853

Rohmah, M. F., Putra, I. K. G. D., Hartati, R. S., & Ardiantoro, L. (2021). Comparison Four Kernels of SVR to Predict Consumer Price Index. *Journal of Physics: Conference Series*, *1737*(1), 012018. https://doi.org/10.1088/1742-6596/1737/1/012018

Shinkarenko, V., Hostryk, A., Shynkarenko, L., & Dolinskyi, L. (2021). A forecasting the consumer price index using time series model. *SHS Web of Conferences*, *107*, 10002. https://doi.org/10.1051/shsconf/202110710002

Wanto, A., Fauzan, M., Suhendro, D., Parlina, I., Damanik, B. E., Siregar, P. A., & Hidayati, N. (2018). Epoch Analysis and Accuracy 3 ANN Algorithm using Consumer Price Index Data in Indonesia: *Proceedings of the 3rd International Conference of Computer, Environment, Agriculture, Social Science, Health Science, Engineering and Technology*, 35–41. https://doi.org/10.5220/0010037400350041

Zhang, X. (2023). Forecast and Analysis of China's CPI Based on SARIMA Model. In D. Qiu, Y. Jiao, & W. Yeoh (Eds.), *Proceedings of the 2022 International*

Conference on Bigdata Blockchain and Economy Management (ICBBEM 2022) (Vol. 5, pp. 1354–1361). Atlantis Press International BV. https://doi.org/10.2991/978-94-6463-030-5_135

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Original Research

Determinants of Voluntary Carbon Disclosure in Indonesian Company: Greenwashing Risks

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Abstract

There is a greenwashing risk in voluntary carbon disclosure and there are no adequate regulations for stakeholder protection. So, there is a risk of providing information that can mislead stakeholders in making decisions. This research will analyze the determinants of carbon emission disclosure by considering the risk of greenwashing in Indonesian companies. This study also uses the ratification period of Presidential Regulation No.98 to analyze its contribution to the relationship between variables. It is necessary to study the role and ability of regulators to intervene in Indonesian companies. This study uses a random effect model to examine the influence between variables. The total data sample for this study is 876 (firm-years). This study also uses the Difference in Difference (DID) method to address the risk of endogeneity, and to evaluate the effect between research variables by adding the ratification period to Presidential Regulation No.98. Empirical results show that corporate governance has a positive effect on carbon emissions disclosure. Changes in carbon emissions has a positive effect on carbon emissions disclosure. The results show the period of ratification of Presidential Regulation No.98 can strengthen the relationship between corporate governance and carbon emissions disclosure, and can strengthen the relationship between changes in carbon emissions and carbon emissions disclosure when companies fail to mitigate carbon emissions.

Keywords: DID Methods, Government Policy and Regulation, Greenwashing Risk, Sustainability, Voluntary Disclosure.

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Introduction

The carbon emissions produced by Indonesia are dominated by the energy sector and the AFOLU (agricultural, forestry and other land use) sector (Central Bureau of Statistics, 2021). Carbon emissions from these two sectors are closely related to all activities carried out by business entities in Indonesia. Business entities are one of the main parties causing extreme climate change, because their activities produce a lot of greenhouse gases and have an impact on people's quality of life. The company's accountability and transparency regarding carbon emissions are important for the company's stakeholders.

Companies are not only expected to contribute to the country's economic growth, but also contribute to adequately address environmental and social problems. The ratification of the Presidential Regulation (Perpres) No.98 of 2021 is the government's effort to address the problem of carbon emissions and also encourage increased financing of green investment. However, until now the carbon emissions disclosure in Indonesia is still voluntary.

There are no policies and regulations that explicitly require companies in Indonesia to disclose all information about carbon emissions in company reports based on certain standards. This situation causes various disclosure techniques for each company, even quite a number of companies do not adequately disclose all carbon emission information in the required reports.

Based on stakeholder theory in the instrumental aspect, it indicates that companies with good environmental performance will publish these achievements and vice versa (Giannarakis et al., 2017; Velte et al., 2020). In contrast to socio-political theory which indicates that companies with poor environmental performance, will make more disclosures to gain stakeholder sympathy (Fontana et al., 2015; Doan & Sassen, 2020).

Thus, the weakness of regulations related to carbon disclosure in Indonesia can mislead stakeholders in making decisions, due to the risk of greenwashing by companies. The results of research by Wedari et al., (2021) indicate greenwashing can occur due to the weakness of the entire system, both from the side of the company as a producer, the community as a consumer, the government as a regulator, and market needs. The company establishes an environmentally friendly image as a good communication and marketing strategy.

For companies, an environmentally friendly identity becomes important due to pressure from the market by investors, consumers and competitors (Gil-Cordero et al., 2020). However, stakeholders sometimes do not pay attention to the way the company takes to achieve these goals. Many consumers support the green movement without first analyzing the actions taken by producers (Uyar et al., 2020). This is because consumers are too optimistic about what producers offer and have a narrow understanding of environmental concerns.

In terms of regulation, the existing regulations are still loose to regulate environmental movements. This is followed by regulators who still do not provide space for participation for organizations, non-governmental organizations, and environmental activists in the

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process of monitoring, soliciting aspirations, and making environmental regulations, especially regarding greenwashing. This condition provides an opportunity for entities to carry out greenwashing which can mislead stakeholders. Research by Cowan & Deegan (2011); Tauringana & Chithambo (2015); Grauel & Gotthardt (2016); Guenther et al., (2016) prove that policies and regulations can intervene in the actions and decisions of companies, especially the issue of carbon emissions and carbon disclosure.

Greenwashing is also motivated by the company's obligation to realize the sustainable development goals (SDGs) determined by the United Nations. Greenwashing can make companies seem sustainable in their accountability reports on SDGs (Kalesnik et al., 2021). Greenwashing can be done by exaggerating the impact that is actually small, including activities that are actually normally carried out by companies as innovations to achieve the SDGs, or even inserting things that are not related to these achievements (Mateo-Márquez et al., 2021). Voluntary environmental disclosure is a medium that companies can use for greenwashing.

Research by Wedari et al., (2021) investigated the issue of greenwashing in the relationship between voluntary environmental disclosures and actual environmental performance of Australian companies. The study found evidence that companies with poor environmental performance have the potential to do greenwashing to change the negative perceptions of stakeholders. On the other hand, there is no evidence of greenwashing practices in companies with good environmental performance. This study supports the need for further regulation, including mandatory environmental disclosures and punitive measures to address the issue of greenwashing in corporate voluntary reporting.

Only a few studies have considered the issue of greenwashing in investigating the relationship between actual environmental performance and voluntary environmental disclosures of companies, especially for Indonesia, is one of the motivations for this study. The last study using Indonesian company data by Ratmono et al., (2021) only examined the relationship between carbon performance and disclosure of carbon emissions. Thus, voluntary carbon disclosure in Indonesia still raises controversial questions. Are regulations and policies in Indonesia sufficient to encourage carbon control and achieve NDC (Nationally Determined Contribution) targets. Is the company's carbon disclosure relevant to the company's ability to reduce carbon emissions. Is carbon disclosure by companies as an effort to gain legitimacy and fulfill responsibilities to stakeholders or as greenwashing which aims to cover up the company's failure to mitigate environmental damage.

Literature Review

Determinants of Carbon Emission Disclosure

The determinants of carbon disclosure have been extensively investigated by researchers. From the factor of company features, previous research examines the relationship between company size and disclosure of carbon emissions. The findings show that company size has a positive effect on the level of carbon disclosure (Freedman & Jaggi, 2005; Prado-Lorenzo et al., 2009; Prado-Lorenzo & Garcia-Sanchez, 2010;

Rankin et al., 2011; Cotter & Najah, 2012; Luo et al., 2012; Stanny, 2013; Ben-Amar & McIlkenny, 2015; Eleftheriadis & Anagnostopoulou, 2015; Liao et al., 2015; Peng et al., 2015; Tauringana & Chithambo, 2015; Gonzalez-Gonzalez & Ramirez, 2016; Faisal et al., 2018; Giannarakis et al., 2018; Li et al., 2018; Akbaş & Canikli, 2019; Iswati & Setiawan, 2020; Ratmono et al., 2021).

Other company characteristic factors such as profitability has a positive effect on carbon disclosure (Prado-Lorenzo et al., 2009; Gonzalez-Gonzalez & Ramirez, 2016; Faisal et al., 2018; Akbaş & Canikli, 2019). Market value has a positive effect on the level of disclosure (Akbaş & Canikli, 2019). The ratio of foreign sales has a positive effect on carbon disclosure (Stanny & Ely, 2008; Stanny, 2013; Gonzalez-Gonzalez & Ramirez, 2016; Halkos & Skouloudis, 2016). Disclosure history has a positive effect on disclosure of carbon emissions (Stanny & Ely, 2008; Stanny, 2013; Peng et al., 2015). Company reputation has a positive effect on disclosure of carbon emissions (Akbaş & Canikli, 2019). Leverage ratio has a negative effect on disclosure of carbon emissions (Tauringana & Chithambo, 2015; Ben-Amar et al., 2017; Faisal et al., 2018; Iswati & Setiawan, 2020; Ratmono et al., 2021). Financial performance has a positive effect on disclosure of carbon emissions (Andrian & Kevin, 2021).

Corporate governance factors such as board independence has a positive effect on disclosure of carbon emissions (Amran et al., 2014; Liao et al., 2015; Jaggi et al., 2018; Krishnamurti & Velayutham, 2018; He et al., 2019). Female directors has a positive effect on disclosure of carbon emissions (Prado-Lorenzo & Garcia-Sanchez, 2010; Liao et al., 2015; Ben-Amar et al., 2017; Krishnamurti & Velayutham, 2018; Hollindale et al., 2019). Board size has a positive effect on disclosure of carbon emissions (Tauringana & Chithambo, 2015; He et al., 2019; Iswati & Setiawan, 2020). Board size has a negative effect on disclosure of carbon emissions (Prado-Lorenzo & Garcia-Sanchez, 2010). CEO-Chair duality has a positive effect on disclosure of carbon emissions (Prado-Lorenzo & Garcia-Sanchez, 2010). CEO-Chair duality has a negative effect on disclosure of carbon emissions (Amran et al., 2014; Krishnamurti & Velayutham, 2018; He et al., 2019). The Environmental Committee has a positive effect on disclosure of carbon emissions (Rankin et al., 2011; Peters & Romi, 2014; Liao et al., 2015; Córdova et al., 2018; Jaggi et al., 2018). The independent risk management committee has a positive effect on disclosure of carbon emissions (Krishnamurti & Velayutham, 2018). The effectiveness of the board of directors has a positive effect on the disclosure of carbon emissions (Ben-Amar & McIlkenny, 2015). Corporate governance has a positive effect on disclosure of carbon emissions (Elsayih et al., 2018; Nasih et al., 2019; Andrian & Kevin, 2021).

In terms of environmental factors, research by Chu et al., (2013); Amran et al., (2014); Peng et al., (2015); Halkos & Skouloudis (2016); Ben-Amar et al., (2017); Ott et al., (2017); Jaggi et al., (2018); He et al., (2019); Lemma et al., (2019); Luo (2019) found that companies with high carbon emissions also has high carbon disclosure. In contrast to research by Dawkins & Fraas (2011); Gallego-Álvarez et al., (2011); Tauringana & Chithambo (2015); Guenther et al., (2016); Giannarakis et al., (2017); Giannarakis et al., (2018) found that companies with low carbon emissions has high carbon disclosure. Other studies found environmental performance has a negative effect on corporate environmental disclosure (Hughes et al., 2001; Patten, 2002; Cho & Patten, 2007; Clarkson et al., 2011; Cho et al., 2012; Meng et al., 2014). In contrast to research by Luo

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& Tang (2014); Giannarakis et al., (2017) found carbon performance has a positive impact on corporate carbon disclosure. Andrian & Kevin (2021) found companies with green strategies and high disclosure of social responsibility has high levels of carbon disclosure. In contrast to other studies that found carbon performance has no significant effect on carbon disclosure (Stanny & Ely, 2008; Kim & Lyon, 2011; Freedman & Jaggi, 2011; Rohani et al., 2021; Ratmono et al., 2021).

In terms of institutional characteristic factors, the government regulations related to the environment has a positive impact on the level of carbon disclosure (Reid & Toffel, 2009; Grauel & Gotthardt, 2016; Guenther et al., 2016). In contrast to research by Luo (2019) found government regulations has a negative effect on the level of carbon disclosure. Research by Cowan & Deegan (2011); Tauringana & Chithambo (2015) found policies and regulations has a positive effect on the level of carbon disclosure. Other studies found the Kyoto protocol has a positive impact on carbon disclosure (Freedman & Jaggi, 2005; Freedman & Jaggi, 2011; Gallego-Álvarez et al., 2011). Research by Luo et al., (2012); Liesen et al., (2015); Luo (2019); Schiemann & Sakhel (2019) found the existence of a carbon trading market can has a positive impact on the level of carbon disclosure. Research by Rankin et al., (2011); Qian et al., (2018) found environmental management systems has a positive effect on the level of carbon disclosure. Other studies found the corporate social responsibility has a positive effect on carbon disclosure (Halkos & Skouloudis, 2016; Giannarakis et al., 2018). Research by Giannarakis et al., (2018); He et al., (2019) found state-owned enterprises has a high level of carbon disclosure. In contrast to research by Chu et al., (2013) found state-owned enterprises has a low level of carbon disclosure.

In terms of stakeholder factors, research by Cotter & Najah (2012); Sullivan & Gouldson (2012); Liesen et al., (2015); Gonzalez-Gonzalez & Ramirez (2016); Kalu et al., (2016); Tang & Demeritt (2018); He et al., (2019) found stakeholder pressure to has a positive effect on the level of carbon disclosure. Other studies found the media coverage has a positive effect on the level of carbon disclosure (Guenther et al., 2016; Li et al., 2017; Li et al., 2018).

All of these determinants have been shown to has a large impact on the carbon emission disclosure. However, there is still controversy regarding the determinants of carbon disclosure, especially corporate governance factors and carbon or environmental performance factors.

Corporate Governance and Carbon Emissions Disclosure

The relationship between corporate governance and carbon emissions disclosure raises various perspectives regarding the findings obtained by previous researchers. On corporate governance factors, research by Tauringana & Chithambo (2015); He et al., (2019); Iswati & Setiawan (2020) found the structure of corporate governance, such as board size, has a positive effect on disclosure of carbon emissions. In contrast to research by Prado-Lorenzo & Garcia-Sanchez (2010) found board size has a negative effect on disclosure of carbon emissions. Other corporate governance structures such as CEO-Chair duality has a positive effect on disclosure of carbon emissions (Prado-Lorenzo & Garcia-Sanchez, 2010). Other studies found the CEO-Chair duality has a negative effect

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on carbon emissions disclosure (Amran et al., 2014; Krishnamurti & Velayutham, 2018; He et al., 2019). Corporate governance has a positive effect on disclosure of carbon emissions (Elsayih et al., 2018; Nasih et al., 2019; Andrian & Kevin, 2021).

Change in Carbon Emissions and Carbon Emissions Disclosure

The relationship between changes in carbon emissions and disclosure of carbon emissions raises various perspectives regarding the findings obtained by previous researchers. Research by Luo & Tang (2014); Giannarakis et al., (2017) found carbon performance has a significant effect on carbon emissions disclosure. In contrast to research by Stanny & Ely (2008); Kim & Lyon (2011); Freedman & Jaggi (2011); Rohani et al., (2021); Ratmono et al., (2021) found carbon performance has no effect on carbon emissions disclosure. Research by Hughes et al., (2001); Patten (2002); Cho & Patten (2007); Clarkson et al., (2011); Cho et al., (2012); Meng et al., (2014) found environmental performance has a negative effect on environmental disclosure.

A recent study by Wedari et al., (2021) investigated the issue of greenwashing in the relationship between voluntary environmental disclosure and environmental performance in Australian companies. The study found the companies with poor environmental performance has the potential to carry out greenwashing to change negative stakeholder perceptions. On the other hand, there is no evidence of greenwashing practices in companies with good environmental performance. This study supports the need for further regulation, including mandatory environmental disclosures and the existence of penalties to address greenwashing in corporate voluntary reporting.

There are 2 theories in the literature that are usually used to investigate the issue of greenwashing and explain the relationship between the level of voluntary environmental disclosure and actual environmental performance (Wedari et al., 2021). The first is socio-political theory, which suggests that companies with poor environmental performance will disclose more environmental information to stakeholders (Al-Tuwaijri et al., 2004; Clarkson et al., 2008; Iatridis, 2013; Luo & Tang, 2014; Oates & Moradi-Motlagh, 2016; Giannarakis et al., 2017; Tadros & Magnan, 2019; Datt et al., 2019; Velte et al., 2020). The second is voluntary disclosure theory, indicating that companies with good environmental performance will disclose more environmental information to their stakeholders (Cho et al., 2006; De Villiers & Van Staden, 2006; Dawkins & Fraas, 2011; Fontana et al., 2015; Doan & Sassen, 2020).

Hypothesis Development

Corporate Governance and Carbon Emission Disclosure

Stakeholder theory indicates that the company will carry out business activities and make decisions that are relevant to stakeholder expectations. External pressures from corporate stakeholders, namely customers, government, investors, non-governmental organizations, local communities, and the media tend to increase steadily regarding social and environmental issues (Miklosik et al., 2021). Companies are expected to be able to carry out business activities and make decisions that are relevant to sustainable development goals (Arslan et al., 2022).

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Corporate governance practices are very important when considering the extent to which companies are proactive in addressing social and environmental issues, particularly climate change. Transparency of carbon disclosure in several countries, especially Indonesia is still voluntary. There are still many companies that do not make adequate disclosures, because there are no rules and standards that can be used as mandatory references for companies. This situation can mislead stakeholders in making decisions. In addition, voluntary disclosure is also vulnerable to greenwashing practices that may be carried out by companies.

Companies with a strong governance structure tend to be more proactive in adequate accountability and transparency in carbon disclosure. This is because companies have a broader perspective regarding the long-term benefits that companies can obtain from implementing responsibility and transparently disclosing environmental information. Thus, implementing adequate corporate governance is an important thing that can be implemented by companies to achieve the expected goals.

The author will review the relationship between corporate governance and carbon disclosure, because previous research results show inconsistent findings. This may be caused by differences in mechanisms for determining carbon emission disclosure based on cultural, environmental and market aspects. By conducting this research, you can narrow the gap in previous research results. In particular, this research can contribute to the limited literature review that investigates the relationship between corporate governance and carbon emissions disclosure in Indonesian companies. In Indonesian companies, research related to this relationship was only carried out by Nasih et al., (2019); Andrian & Kevin (2021).

Their research is also limited to companies in the consumer goods, mining and agriculture sectors, so the results of this research cannot be generalized to all Indonesian companies. This study does not limit the research population to certain sectors. It is possible for all companies from various sectors to become research samples. In addition, this research will consider the ratification of Presidential Regulation No. 98 of 2021 as an important part of research, but don't ignore other periods. The data was taken from 2017 to 2022 after the Paris agreement was signed by Indonesia in 2016. The following is the hypothesis that the author proposes:

Hypothesis 1. Corporate governance has a positive effect on carbon emissions disclosure.

Changes in Carbon Emissions and Carbon Emission Disclosure

Referring to the theory of stakeholders that indicate that the company will carry out actions and make decisions that are relevant to the expectations of stakeholders. In the current era the company is expected to contribute to achieving sustainable development goals. In this case the company does not only focus on achieving adequate financial performance. However, companies also need to create a business environment that cares about social and environmental aspects. One form of company concern for social and environmental aspects can be applied through the achievement of adequate carbon performance.

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The company's ability to adequately mitigate carbon emissions is part of the company's accountability to stakeholders. The accountability practice is expected to be relevant to transparency in providing environmental information to stakeholders. The relevance between accountability and transparency practices is very important for stakeholders in order to make the right decisions. In Indonesia, the practice of disclosure of environmental information, especially the disclosure of carbon is still voluntary. Many companies may have good carbon performance, but do not carry out adequate carbon disclosure techniques. Maybe many companies have poor carbon performance, but do adequate disclosure techniques to be seen as a green company. Thus, the problem of greenwashing is very vulnerable to occur in the practice of carbon disclosure in Indonesian companies.

There are two theories in the literature that are usually used to investigate the problem of greenwashing and explain the relationship between the level of voluntary environmental disclosure and actual environmental performance. First is the socio-political theory, indicating that companies with poor environmental performance will reveal more environmental information to stakeholders. Second is stakeholder theory in the instrumental aspect, indicating that companies with good environmental performance will reveal more environmental information to stakeholders.

The relationship between actual environmental performance and the level of environmental disclosure has attracted the attention of many researchers and has produced various findings. Such variations may be due to different environmental performance proxies, different standards and guidelines for the level of environmental disclosure, and the socio-political status and regulations of each country.

In addition, the limitations of research on the issue of greenwashing in investigating the relationship between environmental performance and corporate voluntary environmental disclosures, especially for the State of Indonesia, motivated the authors to investigate this issue. The recent study by Ratmono et al., (2021) only investigated the relationship between carbon performance and carbon disclosure in Indonesian companies, but did not consider the risk of greenwashing. The following is the hypothesis that the author proposes:

Hypothesis 2a. Companies with decreased carbon emissions will provide higher carbon disclosure than companies with increased carbon.

Hypothesis 2b. Companies with increased carbon will provide higher carbon disclosure than companies with decreased carbon.

Results that support H2b can be interpreted as evidence of greenwashing.While the results that support H2a can be interpreted as evidence of no greenwashing.

Research Methods

This research will use the ASEAN corporate governance scorecard. Proxies are also relevant for use in this study, because Indonesia is part of ASEAN countries. The ASEAN corporate governance scorecard consists of 5 areas based on OECD (Organization of Economic Co-operation and Development) principles. All these fields consist of 185 question items. Change in carbon emissions variable are used in this study to identify the

risk of greenwashing in Indonesian companies. The method of measuring the change in carbon emissions variable in this study refers to research by Wedari et al., (2021). This study will evaluate the carbon disclosure of Indonesian companies using a checklist and measuring method adopted from Tang et al., (2019).

The population in this study are all companies listed on the Indonesian stock exchange (excluding financial companies) which has sustainability reports from 2017 to 2022 totaling 146 companies. This population was chosen because most of the carbon information can only be found in sustainability reports, so its relevant to this research. The period from 2017 to 2022 is the period after the Paris agreement was signed by Indonesia in 2016. The sample in this study is all of the population, totaling 146 companies. Thus, the total sample data for this study is 876 (company-year).

This study uses a random effect model in analyzing the relationship between variables. The random effect model is a model used to overcome the weaknesses that occur in the fixed effect model. This is because the fixed effect model is considered to reduce parameter efficiency, because it has the consequence of reducing the degree of freedom. The robustness test is used to validate the research results.

This study also uses the Difference in Difference (DID) method to evaluate the effect between research variables by adding the period of ratification of Presidential Regulation No.98. The DID method was also used to overcome endogeneity problems that might occur in this study. The baseline period for the ratification of Presidential Regulation No.98 is 2022. This period is the period after the ratification of Presidential Regulation No.98.

The baseline period will be compared one by one with the other periods in this study, where in this study the observation period is from 2017 to 2022. Through the DID analysis, it is also known what the impact of the ratification of Presidential Regulation no. 98 in the relationship between the analyzed variables.

Results and Discussions

Results

The empirical results for corporate governance, changes in carbon emissions, and carbon emissions disclosure are presented in table 1.

Empirical results show an increase in corporate governance can increase carbon emissions disclosure by 0.544. An increase in change in carbon emissions can increase carbon emissions disclosure by 0.988. An increase in firm size can increase carbon emissions disclosure by 2,022. An increase in industry can increase carbon emissions disclosure by 0.933. An increase in growth of company can increase carbon emissions disclosure by 0.772. These results show that large companies with adequate corporate governance practices and good growth rates will carry out more adequate carbon disclosure. Companies that produce the largest carbon emissions and fail to mitigate carbon emissions will carry out more adequate carbon disclosures.

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Table 1. Empirical Results of Corporate Governance, Change in Carbon Emissions, Carbon Emission Disclosure and Control Variables

Variable	Carbon Diclosure Voluntary (CDV)			
	Coef.	std.error	t-value	p-value
Corporate Governance (CG)	0.544	0.137	3.233	0.001
Change in Carbon Emissions (CEP)	0.988	0.679	3.054	0.005
Firm Size	2.022	1.789	2.831	0.010
Firm Leverage	-1.144	1.033	-1.500	0.344
Media Exposure	-1.098	0.991	-0.996	0.467
Industry	0.933	0.657	2.371	0.023
Intensity of Capital	1.002	0.938	1.144	0.401
Growth of Company	0.772	0.651	2.087	0.034
N	876 (Company-Year)			
Adjusted R^2	0.491			
F Value	9.135			
Sig.	0.000			

Discussion of Results

Corporate Governance and Carbon Disclosure Voluntary

Based on empirical results, it shows that the first hypothesis is accepted. Corporate governance has a positive effect on carbon emission disclosure in Indonesian companies. These results are relevant to stakeholder theory which indicates that companies with good stakeholder management will make decisions that are relevant to stakeholder expectations. Stakeholder expectations are not limited to achieving adequate financial performance. Companies also have a responsibility to carry out business activities that are relevant to sustainable development goals.

Overcoming climate change is one of the most important sustainable development goals. Indonesia has an NDC target that must be achieved by 2030. Indonesia invites all people, especially business entities, to contribute to mitigating carbon emissions. Companies with adequate corporate governance have a broader perspective regarding environmental and social issues. The company feels it has a big responsibility towards its stakeholders. To get stakeholder support, the company will carry out business activities and make decisions that are relevant to ethical values.

The majority of Indonesian companies in the research sample have implemented corporate governance that is relevant to certain standards, for example the ASEAN corporate governance scorecard. Research findings show that companies with adequate governance practices based on the ASEAN corporate governance scorecard have a great opportunity to be more transparent in their carbon disclosures. This is because the ASEAN corporate governance scorecard standard is not limited to accountability and transparency of company management towards shareholders, but also other stakeholders, such as society, consumers, government and others. The ASEAN corporate governance scorecard standard is also not limited to management responsibility in managing business to generate company profits, but also management responsibility in environmental and

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social aspects. It is very relevant that companies with adequate corporate governance practices tend to adopt adequate disclosure practices to attract stakeholder attention.

The results of this study are also relevant to research by Elsayih et al., (2018); Nasih et al., (2019); Andrian & Kevin (2021) found corporate governance has a positive effect on carbon disclosure. Amran et al., (2014); Liao et al., (2015); Jaggi et al., (2018); Krishnamurti & Velayutham (2018); He et al., (2019) found corporate governance factors such as board independence has a positive effect on carbon disclosure. Prado-Lorenzo & Garcia-Sanchez (2010); Liao et al., (2015); Ben-Amar et al., (2017); Krishnamurti & Velayutham (2018); Hollindale et al., (2019) found corporate governance factors such as female directors has a positive effect on disclosure of carbon emissions. Tauringana & Chithambo (2015); He et al., (2019); Iswati & Setiawan (2020) found corporate governance factors such as board size has a positive effect on disclosure of carbon emissions.

Prado-Lorenzo & Garcia-Sanchez (2010) found corporate governance factors such as CEO-Chair duality has a positive effect on disclosure of carbon emissions. Rankin et al., (2011); Peters & Romi (2014); Liao et al., (2015); Córdova et al., (2018); Jaggi et al., (2018) found corporate governance factors such as the environment committee has a positive effect on disclosure of carbon emissions. Krishnamurti & Velayutham (2018) found corporate governance factors such as the independent risk management committee has a positive effect on disclosure of carbon emissions. Ben-Amar & McIlkenny (2015) found corporate governance factors such as the effectiveness of the board of directors has a positive effect on carbon emissions disclosure.

Change in carbon emissions and Carbon Emissions Disclosure

Based on empirical results, it shows that hypothesis 2b is accepted. Companies with increased carbon will provide higher carbon disclosures. The change in carbon emissions variable has a positive sign, which indicates that the majority of Indonesian companies in the research sample failed to mitigate carbon emissions. These results are relevant to socio-political theory which indicates that large companies that fail to mitigate carbon emissions will try to maintain the company's good name and the trust of their stakeholders.

Promotion as a green company and adopting adequate carbon disclosure practices are ways that companies can attract the attention of stakeholders. In contrast, companies with negative changes in carbon emissions have the potential to not carry out adequate carbon disclosure techniques, because there are no mandatory rules and standards that form the basis for companies to do this. The results of this study also reject hypothesis 2a. Voluntary environmental disclosure has weaknesses, namely the potential for greenwashing that can be carried out by companies.

The findings of this research show that the majority of Indonesian companies in the research sample have failed to mitigate carbon emissions, because the value of the change in carbon emissions variable has a positive sign. Then Indonesian companies, which are among the largest carbon emitting industries, tend to adopt more adequate carbon disclosure practices. Thus, most of the Indonesian companies sampled in this research could potentially carry out greenwashing to appear as green companies. Promotion through the media and adequate carbon disclosure are tools that can be used to eliminate the label of environmentally destructive companies. There is no guarantee that the company has actually succeeded in mitigating carbon emissions.

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The role of regulators is very important to overcome this problem. Until now there are no specific regulations that require companies to mitigate carbon emissions and disclose them according to certain standards. So there is no tool to compare each company's ability to mitigate carbon emissions. There are companies that are able to mitigate carbon emissions, but do not implement adequate disclosure techniques. In contrast, there are companies that fail to mitigate carbon emissions, but implement adequate disclosure and promotion to be seen as green companies.

The results of this study are relevant to the research of Wedari et al., (2021) found the potential for greenwashing in Australian companies with poor environmental performance. In contrast, no greenwashing potential was found in Australian companies that has decreased carbon emissions. The results of this study are relevant to socio-political theory which indicates that companies with poor environmental performance will try to change the negative perceptions of stakeholders and try to reduce the risk of information asymmetry. This research supports the need for further regulation, including mandatory environmental disclosures and punitive measures to address greenwashing issues in corporate voluntary reporting.

Robustness Test

Corporate Governance and Carbon Emission Disclosure Period of Ratification Presidential Regulation No.98

The results of the robustness test for corporate governance and carbon emission disclosure period of ratification Presidential Regulations No.98 is stated in table 2.

Table 2. Empirical Results of Corporate Governance and Carbon Emission Disclosure Period of Ratification Presidential Regulation No. 98

Variable	Carbon Disclosure Voluntary				
	t-value				
	2017	2018	2019	2020	2021
Regulation Period	2.113**	2.040**	2.071**	2.039**	3.423**
Corporate Governance	2.462**	2.330**	2.196**	2.040**	2.571**
Interaction of Regulation Period and CG	3.037**	3.221**	2.468**	2.117**	3.106**
Firm Size	0.988	1.871	2.006**	2.121**	2.676**
Firm Leverage	-1.233	-1.101	-0.912	-0.667	-0.943
Media Exposure	-0.673	-0.885	-1.237	-1.450	-1.714
Industry	3.105**	2.671**	2.303**	2.003**	2.844**
Intensity of Capital	1.334	1.205	1.443	1.712	1.450
Growth of Company	3.115**	2.055**	2.118**	2.030**	2.107**
**(significant)					

The robustness results with 2022 as the baseline period show quite consistent results. Especially for corporate governance, interaction of regulation and CG, regulation period, industry, and growth of company variables. These results indicate that the ratification of Presidential Regulation No.98 played a role in influencing the relationship between

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corporate governance and carbon emissions disclosure in Indonesian companies. Ratification of Presidential Regulation No. 98 can strengthen the relationship between corporate governance and carbon emissions disclosure. Consistently large companies with adequate corporate governance practices will carry out carbon disclosures. Companies with good growth rates and those in the largest carbon emitting industries will carry out carbon disclosure.

Change in Carbon Emission and Carbon Emission Disclosure Period of Ratification Presidential Regulation No.98

The results of the robustness test for change in carbon emissions and carbon emission disclosure period of ratification Presidential Regulations No.98 are stated in table 3.

Table 3. Empirical Results of Change in Carbon Emission and Carbon Emission Disclosure Period of Ratification Presidential Regulation No.98

Variable	Carbon Disclosure Voluntary				
	t-value				
	2017	2018	2019	2020	2021
Regulation Period	2.821**	2.638**	2.411**	3.101**	3.530**
Change in Carbon Emission (CEP)	3.202**	2.566**	2.605**	-1.998**	-2.257**
Interaction of Regulation Period and CEP	2.882**	2.413**	3.114**	-1.638	-1.455
Firm Size	3.412**	3.122**	2.677**	2.550**	2.011**
Firm Leverage	-0.774	-1.211	-1.353	-0.880	-0.814
Media Exposure	-0.662	-0.783	-0.884	1.020	0.977
Industry	2.237**	3.032**	1.677	1.255	2.510**
Intensity of Capital	0.836	0.847	1.280	1.015	0.971
Growth of Company	2.101**	2.433**	2.751**	2.673**	2.440**
**(Significant)					

The robustness results with 2022 as the baseline period show inconsistent results. Especially for change in carbon emissions, interaction of regulation period and CEP, and industry variables. These results indicate that the ratification of Presidential Regulation No.98 can strengthen the relationship between changes in carbon emissions and carbon emissions disclosure in certain circumstances. These results consistently show that large companies with good growth rates, but fail to mitigate carbon emissions, will carry out more adequate carbon disclosures.

Further Analysis

This study used the DID (difference in difference) method in conducting the robustness test. This research also wants to see the ratification of Presidential Regulation No. 98 of 2021 can strengthen or weaken the relationship between corporate governance, change in carbon emission, and carbon emission disclosure. The DID method was also used to overcome endogeneity problems that might occur in this study. The baseline period of ratification of Presidential Regulation No.98 is 2022. This period is the period after the

ratification of Presidential Regulation No.98 which will be compared one by one with the other periods in this study. The observation period in this study is from 2017 to 2022.

The robustness test results of corporate governance and carbon emission disclosure indicate that the ratification of presidential regulation No.98 can strengthen the relationship between corporate governance and disclosure of carbon emissions. These results are consistent every time the test is carried out per period with 2022 as the baseline period. This shows that the company considers the government as an important stakeholder in managing business and making decisions. The company will adjust its business activities to the applicable standards and regulations to gain legitimacy from stakeholders, especially the government, to maintain business continuity in the long term.

This is good because through regulations made by the government, the government can control companies. Activities and decision-making by companies can be directed to be relevant to the government's goals to achieve NDC targets and adequately achieve sustainable development goals. Environmental disclosure, especially carbon information in Indonesia is still voluntary. Further regulations are needed regarding environmental disclosure obligations based on certain standards to mitigate greenwashing risks and other risks that can mislead stakeholders in making decisions.

The results of the robustness test for change in carbon emissions and carbon emission disclosure indicate that the ratification of Presidential Regulation No. 98 can strengthen the relationship between change in carbon emissions and carbon emission disclosure in certain circumstances. The test results are inconsistent for each observation period with 2022 as the baseline period. The results of the robustness test show the period of ratification of Presidential Regulation No.98 can strengthen the relationship between variables when change in carbon emission has a positive effect on carbon emission disclosure.

Meanwhile, when changes in carbon emissions have a negative effect on carbon emissions disclosure, the period of ratification of Presidential Regulation No.98 has no impact on the relationship between these variables. The negative impact between the relationship changes in carbon emissions and carbon emissions disclosure occurred in 2020 and 2021. Those years were the extreme period of the Covid-19 pandemic which caused an economic crisis and many company activities stopped. So, the company's first focus in 2020 and 2021 will be on financial recovery, not on environmental aspects. Then in 2022 there is a positive relationship between change in carbon emissions and carbon emissions disclosure.

Overall, there is a risk of greenwashing in voluntary carbon disclosure practices in Indonesian companies. Companies that fail to mitigate carbon emissions will implement more adequate environmental information disclosure techniques to be seen as green companies and transparent in their business activities. While companies that have succeeded in mitigating carbon emissions, do not disclose this information because there are no mandatory standards that can be used as a reference in carbon disclosure practices. Environmental disclosure, especially disclosure of carbon information in Indonesia is still voluntary.

This proves that current regulations in Indonesia are not sufficient to make companies carry out adequate carbon mitigation and disclosure practices. Ratification of Presidential Regulation No. 98 regulates the application of carbon economic values to achieve national NDC targets and control greenhouse gas emissions in national development. However, it does not regulate the company's obligation to disclose carbon emissions according to certain standards and regulations. This situation can mislead stakeholders in making decisions.

Conclusion

The results of this study indicate that voluntary carbon disclosure in Indonesia is influenced by the principles of corporate governance and the ability of companies to mitigate carbon emissions. Companies that fail to mitigate carbon emissions are more at risk of carrying out greenwashing actions through carbon disclosure, compared to companies that succeed in mitigating carbon emissions. This is because carbon disclosure in Indonesia is still voluntary. There are no regulations requiring Indonesian companies to disclose carbon information according to specific standards. This can also have a impact on the perception of company management in carrying out carbon disclosures. Carbon disclosure can be used as a tool to gain stakeholder trust and achieve certain goals. The findings of this research are relevant to socio-political theory which indicates that all business activities and decision making by company management can be influenced by the interests to be achieved. In this case, companies with increased carbon emissions in the current year will adopt more adequate carbon disclosure techniques. The role of the regulator also influences this, because the regulator is part of the company's stakeholders. Company management will adjust all relevant business activities and decision making to stakeholder expectations. Adequate corporate governance practices can influence management's perspective in making choices. Companies have the motivation to adopt ethical actions that can provide benefits in the long term. This is relevant to the concept of stakeholder theory which indicates that companies with good stakeholder management can survive for a long time. This research supports the need for further and adequate regulation related to carbon emission mitigation, including mandatory environmental disclosures and punitive measures to address greenwashing issues in corporate voluntary reporting. It is hoped that future research can complement the weaknesses in this research which only focuses on the role of current regulations in influencing the relationship between variables. The risk of greenwashing in this research has also not been discussed in depth. This research is limited to proving the existence of greenwashing risks in Indonesian companies, but has not fully explored this problem in depth.

References

Akbaş, H. E., & Canikli, S. (2019). Determinants of voluntary greenhouse gas emission disclosure: An empirical investigation on Turkish firms. *Sustainability (Switzerland)*, *11*(1). https://doi.org/10.3390/su11010107

Al-Tuwaijri, S. A., Christensen, T. E., & Hughes, K. E. (2004). The relations among environmental disclosure, environmental performance, and economic performance: A simultaneous equations approach. *Accounting, Organizations and Society*, *29*(5–6), 447–471. https://doi.org/10.1016/S0361-3682(03)00032-1

Amran, A., Periasamy, V., & Zulkafli, A. H. (2014). Determinants of climate change disclosure by developed and emerging countries in asia pacific. *Sustainable Development*, *22*(3), 188–204. https://doi.org/10.1002/sd.539

Andrian, T., & Kevin. (2021a). Determinant Factors of Carbon Emission Disclosure in Indonesia. *Journal of Southwest Jiaotong University*, *56*(1), 346–357. https://doi.org/10.35741/issn.0258-2724.56.1.32

Andrian, T., & Kevin. (2021b). Determinant Factors of Carbon Emission Disclosure in Indonesia. *Journal of Southwest Jiaotong University*, *56*(1). https://doi.org/10.35741/issn.0258-2724.56.1.32

Arslan, H. M., Chengang, Y., Bilal, Siddique, M., & Yahya, Y. (2022). Influence of Senior Executives Characteristics on Corporate Environmental Disclosures: A Bibliometric Analysis. *Journal of Risk and Financial Management*, *15*(3), 136. https://doi.org/10.3390/jrfm15030136

Ben-Amar, W., Chang, M., & McIlkenny, P. (2017). Board Gender Diversity and Corporate Response to Sustainability Initiatives: Evidence from the Carbon Disclosure Project. *Journal of Business Ethics*, *142*(2), 369–383. https://doi.org/10.1007/s10551-015-2759-1

Ben-Amar, W., & McIlkenny, P. (2015). Board Effectiveness and the Voluntary Disclosure of Climate Change Information. *Business Strategy and the Environment*, *24*(8), 704–719. https://doi.org/10.1002/bse.1840

Central Bureau of Statistics. (2021). *Statistik Lingkungan Hidup Indonesia 2021*.

Cho, C. H., Guidry, R. P., Hageman, A. M., & Patten, D. M. (2012). Do actions speak louder than words? An empirical investigation of corporate environmental reputation. *Accounting, Organizations and Society*, *37*(1), 14–25. https://doi.org/10.1016/j.aos.2011.12.001

Cho, C. H., & Patten, D. M. (2007). The role of environmental disclosures as tools of legitimacy: A research note. *Accounting, Organizations and Society*, *32*(7–8), 639–647. https://doi.org/10.1016/j.aos.2006.09.009

Cho, C. H., Patten, D. M., & Roberts, R. W. (2006). Corporate political strategy: An examination of the relation between political expenditures, environmental performance, and environmental disclosure. *Journal of Business Ethics*, *67*(2), 139–154. https://doi.org/10.1007/s10551-006-9019-3

Chu, C. I., Chatterjee, B., & Brown, A. (2013). The Current Status of Greenhouse Gas Reporting by Chinese Companies. *Managerial Auditing Journal*, *28*(2), 114–139.

Clarkson, P. M., Li, Y., Richardson, G. D., & Vasvari, F. P. (2008). Revisiting the relation between environmental performance and environmental disclosure: An empirical analysis. *Accounting, Organizations and Society*, *33*(4–5), 303–327. https://doi.org/10.1016/j.aos.2007.05.003

Clarkson, P. M., Overell, M. B., & Chapple, L. (2011). Environmental Reporting and its Relation to Corporate Environmental Performance. *Abacus*, *47*(1), 27–60. https://doi.org/10.1111/j.1467-6281.2011.00330.x

Córdova, C., Zorio-Grima, A., & Merello, P. (2018). Carbon emissions by South American companies: Driving factors for reporting decisions and emissions reduction. *Sustainability (Switzerland)*, *10*(7), 1–16. https://doi.org/10.3390/su10072411

Cotter, J., & Najah, M. M. (2012). Institutional investor influence on global climate change disclosure practices. *Australian Journal of Management*, *37*(2), 169–187. https://doi.org/10.1177/0312896211423945

Cowan, S., & Deegan, C. (2011). Corporate disclosure reactions to Australia's first national emission reporting scheme. *Accounting and Finance*, *51*(2), 409–436. https://doi.org/10.1111/j.1467-629X.2010.00361.x

Datt, R. R., Luo, L., & Tang, Q. (2019). Corporate voluntary carbon disclosure strategy and carbon performance in the USA. *Accounting Research Journal*, *32*(3), 417–435. https://doi.org/10.1108/ARJ-02-2017-0031

Dawkins, C., & Fraas, J. W. (2011). Coming Clean: The Impact of Environmental Performance and Visibility on Corporate Climate Change Disclosure. *Journal of Business Ethics*, *100*(2), 303–322. https://doi.org/10.1007/s10551-010-0681-0

De Villiers, C., & Van Staden, C. J. (2006). Can less environmental disclosure have a legitimising effect? Evidence from Africa. *Accounting, Organizations and Society*, *31*(8), 763–781. https://doi.org/10.1016/j.aos.2006.03.001

Doan, M. H., & Sassen, R. (2020). The relationship between environmental performance and environmental disclosure: A meta-analysis. *Journal of Industrial Ecology*, *24*(5), 1140–1157. https://doi.org/10.1111/jiec.13002

Eleftheriadis, I. M., & Anagnostopoulou, E. G. (2015). Relationship between Corporate Climate Change Disclosures and Firm Factors. *Business Strategy and the Environment*, *24*(8), 780–789. https://doi.org/10.1002/bse.1845

Elsayih, J., Tang, Q., & Lan, Y.-C. (2018). Corporate Governance and Carbon Transparency : Australian Experience. *Accounting Research Journal*, *07*(2018), 1–26. https://doi.org/10.1108/ARJ-12-2015-0153

Faisal, F., Andiningtyas, E. D., Achmad, T., Haryanto, H., & Meiranto, W. (2018). The content and determinants of greenhouse gas emission disclosure: Evidence from Indonesian companies. *Corporate Social Responsibility and Environmental Management*, *25*(6), 1397–1406. https://doi.org/10.1002/csr.1660

Fontana, S., D'Amico, E., Coluccia, D., & Solimene, S. (2015). Does environmental performance affect companies' environmental disclosure? *Measuring Business Excellence*, *19*(3), 42–57. https://doi.org/10.1108/MBE-04-2015-0019

Freedman, M., & Jaggi, B. (2005). Global warming, commitment to the Kyoto protocol, and accounting disclosures by the largest global public firms from polluting industries. *International Journal of Accounting*, *40*(3), 215–232. https://doi.org/10.1016/j.intacc.2005.06.004

Freedman, M., & Jaggi, B. (2011). Global warming disclosures: Impact of Kyoto protocol across countries. *Journal of International Financial Management and Accounting*, *22*(1), 46–90. https://doi.org/10.1111/j.1467-646X.2010.01045.x

Gallego-Álvarez, I., Rodríguez-Domínguez, L., & García-Sánchez, I. M. (2011). Study of some explanatory factors in the opportunities arising from climate change. *Journal of Cleaner Production*, *19*(9–10), 912–926. https://doi.org/10.1016/j.jclepro.2011.02.012

Giannarakis, G., Zafeiriou, E., Arabatzis, G., & Partalidou, X. (2018). Determinants of Corporate Climate Change Disclosure for European Firms. *Corporate Social Responsibility and Environmental Management*, *25*(3), 281–294. https://doi.org/10.1002/csr.1461

Giannarakis, G., Zafeiriou, E., & Sariannidis, N. (2017). The Impact of Carbon Performance on Climate Change Disclosure. *Business Strategy and the Environment*, *26*(8), 1078–1094. https://doi.org/10.1002/bse.1962

Gil-Cordero, E., Rondan-Cataluna, F. J., & Rey-Moreno, M. (2020). Premium Private Label Strategies: Social Networks and Traditional Perspectives. *Journal of Innovation & Knowledge*, *6*(2021), 78–91.

Gonzalez-Gonzalez, J. M., & Ramirez, C. Z. (2016). Voluntary carbon disclosure by Spanish companies: an empirical analysis. *International Journal of Climate Change Strategies and Management*, *8*(1), 57–79.

Grauel, J., & Gotthardt, D. (2016). The relevance of national contexts for carbon disclosure decisions of stock-listed companies: a multilevel analysis. *Journal of Cleaner Production*, *133*, 1204–1217. https://doi.org/10.1016/j.jclepro.2016.05.182

Guenther, E., Guenther, T., Schiemann, F., & Weber, G. (2016). Stakeholder Relevance for Reporting: Explanatory Factors of Carbon Disclosure. *Business and Society*, *55*(3), 361–397. https://doi.org/10.1177/0007650315575119

Halkos, G., & Skouloudis, A. (2016). Exploring the current status and key determinants of corporate disclosure on climate change: Evidence from the Greek business sector. *Environmental Science and Policy*, *56*(February 2016), 22–31. https://doi.org/10.1016/j.envsci.2015.10.011

He, P., Shen, H., Zhang, Y., & Ren, J. (2019). External pressure, corporate governance, and voluntary carbon disclosure: Evidence from China. *Sustainability (Switzerland)*, *11*(10). https://doi.org/10.3390/su11102901

Hollindale, J., Kent, P., Routledge, J., & Chapple, L. (2019). Women on boards and greenhouse gas emission disclosures. *Accounting and Finance*, *59*(1), 277–308. https://doi.org/10.1111/acfi.12258

Hughes, S. B., Anderson, A., & Golden, S. (2001). Corporate environmental disclosures: Are they useful in determining environmental performance? *Journal of Accounting and Public Policy*, *20*(3), 217–240. https://doi.org/10.1016/S0278-4254(01)00031-X

Iatridis, G. E. (2013). Environmental disclosure quality: Evidence on environmental performance, corporate governance and value relevance. *Emerging Markets Review*, *14*(1), 55–75. https://doi.org/10.1016/j.ememar.2012.11.003

Iswati, S., & Setiawan, P. (2020). Green Earth: Carbon Emissions, ISO 14001, Governance Structures, Militarily Connected from the Manufacturing Industries in Indonesia. *Journal of Accounting and Investment*, *21*(1), 1–18. https://doi.org/10.18196/jai.2101134

Jaggi, B., Allini, A., Macchioni, R., & Zagaria, C. (2018). The Factors Motivating Voluntary Disclosure of Carbon Information: Evidence Based on Italian Listed Companies. *Organization and Environment*, *31*(2), 178–202. https://doi.org/10.1177/1086026617705282

Kalesnik, V., Pioch, T., Schiemann, F., Wilkens, M., & Zink, J. (2021). Investors Face Challenges with Corporate Carbon Emissions Data – Call for a Mandatory Disclosure Regulation 1. *Sustainable Finance Research Platform*, 1–8.

Kalu, J. U., Buang, A., & Aliagha, G. U. (2016). Determinants of voluntary carbon disclosure in the corporate real estate sector of Malaysia. *Journal of Environmental Management*, *182*, 519–524. https://doi.org/10.1016/j.jenvman.2016.08.011

Kim, E. H., & Lyon, T. P. (2011). Strategic environmental disclosure: Evidence from the DOEs voluntary greenhouse gas registry. *Journal of Environmental Economics and Management*, *61*(3), 311–326. https://doi.org/10.1016/j.jeem.2010.11.001

Krishnamurti, C., & Velayutham, E. (2018). The influence of board committee structures on voluntary disclosure of greenhouse gas emissions: Australian evidence. *Pacific Basin Finance Journal*, *50*(September 2016), 65–81. https://doi.org/10.1016/j.pacfin.2017.09.003

Lemma, T. T., Feedman, M., Mlilo, M., & Park, J. D. (2019). Corporate carbon risk, voluntary disclosure, and cost of capital: South African evidence. *Business Strategy and the Environment*, *28*(1), 111–126. https://doi.org/10.1002/bse.2242

Li, D., Huang, M., Ren, S., Chen, X., & Ning, L. (2018). Environmental Legitimacy, Green Innovation, and Corporate Carbon Disclosure: Evidence from CDP China 100. *Journal of Business Ethics*, *150*(4), 1089–1104.

https://doi.org/10.1007/s10551-016-3187-6

Li, L., Liu, Q., Tang, D., & Xiong, J. (2017). Media reporting, carbon information disclosure, and the cost of equity financing: evidence from China. *Environmental Science and Pollution Research*, *24*(10), 9447–9459. https://doi.org/10.1007/s11356-017-8614-4

Liao, L., Luo, L., & Tang, Q. (2015). Gender diversity, board independence, environmental committee and greenhouse gas disclosure. *British Accounting Review*, *47*(4), 409–424. https://doi.org/10.1016/j.bar.2014.01.002

Liesen, A., Hoepner, A. G., Patten, D. M., & Figge, F. (2015). Information & Computer Security Article information : To cite this document : *Emerald Insight*.

Luo, L. (2019). The influence of institutional contexts on the relationship between voluntary carbon disclosure and carbon emission performance. *Accounting and Finance*, *59*(2), 1235–1264. https://doi.org/10.1111/acfi.12267

Luo, L., Lan, Y. C., & Tang, Q. (2012). Corporate Incentives to Disclose Carbon Information: Evidence from the CDP Global 500 Report. *Journal of International Financial Management and Accounting*, *23*(2), 93–120. https://doi.org/10.1111/j.1467-646X.2012.01055.x

Luo, L., & Tang, Q. (2014). Does voluntary carbon disclosure reflect underlying carbon performance? *Journal of Contemporary Accounting and Economics*, *10*(3), 191–205. https://doi.org/10.1016/j.jcae.2014.08.003

Mateo-Márquez, A. J., González-González, J. M., & Zamora-Ramírez, C. (2021). The influence of countries' climate change-related institutional profile on voluntary environmental disclosures. *Business Strategy and the Environment*, *30*(2), 1357–1373. https://doi.org/10.1002/bse.2690

Meng, X. H., Zeng, S. X., Shi, J. J., Qi, G. Y., & Zhang, Z. B. (2014). The relationship between corporate environmental performance andenvironmental disclosure: An empirical study in China. *Journal of Environmental Management*, *145*(2014), 357–367. https://doi.org/10.1016/j.jenvman.2014.07.009

Miklosik, A., Starchon, P., & Hitka, M. (2021). Environmental sustainability disclosures in annual reports of ASX Industrials List companies. *Environment, Development and Sustainability*, *23*(11), 16227–16245. https://doi.org/10.1007/s10668-021-01338-8

Nasih, M., Harymawan, I., Paramitasari, Y. I., & Handayani, A. (2019a). Carbon emissions, firm size, and corporate governance structure: Evidence from the mining and agricultural industries in Indonesia. *Sustainability (Switzerland)*, *11*(9). https://doi.org/10.3390/su11092483

Nasih, M., Harymawan, I., Paramitasari, Y. I., & Handayani, A. (2019b). Carbon Emissions, Firm Size, and Corporate Governance Structure: Evidence from the

Mining and Agricultural Industries in Indonesia. *Sustainability (Switzerland)*, *11*(9), 1–14. https://doi.org/10.3390/su11092483

Oates, G., & Moradi-Motlagh, A. (2016). Is voluntary disclosure of environmental performance associated with actual environmental performance? Evidence from Victorian local governments, Australia. *Australasian Journal of Environmental Management*, *23*(2), 194–205. https://doi.org/10.1080/14486563.2015.1082156

Ott, C., Schiemann, F., & Günther, T. (2017). Disentangling the determinants of the response and the publication decisions: The case of the Carbon Disclosure Project. *Journal of Accounting and Public Policy*, *36*(1), 14–33. https://doi.org/10.1016/j.jaccpubpol.2016.11.003

Patten, D. M. (2002). The relation between environmental performance and environmental disclosure: A research note. *Accounting, Organizations and Society*, *27*(8), 763–773. https://doi.org/10.1016/S0361-3682(02)00028-4

Peng, J., Sun, J., & Luo, R. (2015). Corporate Voluntary Carbon Information Disclosure: Evidence from China's Listed Companies. *World Economy*, *38*(1), 91–109. https://doi.org/10.1111/twec.12187

Peters, G. F., & Romi, A. M. (2014). Does the Voluntary Adoption of Corporate Governance Mechanisms Improve Environmental Risk Disclosures? Evidence from Greenhouse Gas Emission Accounting. *Journal of Business Ethics*, *125*(4), 637–666. https://doi.org/10.1007/s10551-013-1886-9

Prado-Lorenzo, J. M., & Garcia-Sanchez, I. M. (2010). The Role of the Board of Directors in Disseminating Relevant Information on Greenhouse Gases. *Journal of Business Ethics*, *97*(3), 391–424. https://doi.org/10.1007/s10551-010-0515-0

Prado-Lorenzo, J. M., Rodríguez-Domínguez, L., Gallego-Álvarez, I., & García-Sánchez, I. M. (2009). Factors influencing the disclosure of greenhouse gas emissions in companies world-wide. *Management Decision*, *47*(7), 1133–1157. https://doi.org/10.1108/00251740910978340

Qian, W., Hörisch, J., & Schaltegger, S. (2018). Environmental management accounting and its effects on carbon management and disclosure quality. *Journal of Cleaner Production*, *174*, 1608–1619. https://doi.org/10.1016/j.jclepro.2017.11.092

Rankin, M., Windsor, C., & Wahyuni, D. (2011). An investigation of voluntary corporate greenhouse gas emissions reporting in a market governance system: Australian evidence. *Accounting, Auditing and Accountability Journal*, *24*(8), 1037–1070. https://doi.org/10.1108/09513571111184751

Ratmono, D., Darsono, D., & Selviana, S. (2021). Effect of carbon performance, company characteristics and environmental performance on carbon emission disclosure: Evidence from Indonesia. *International Journal of Energy Economics and Policy*, *11*(1), 101–109. https://doi.org/10.32479/ijeep.10456

Reid, E. M., & Toffel, M. W. (2009). Responding to Public and Private Politics: Corporate Disclosure of Climate Change Strategies. *Strategic Management Journal*, *30*(June), 1157–1178. https://doi.org/10.1002/smj

Rohani, A., Jabbour, M., & Abdel-Kader, M. (2021). Carbon performance, carbon disclosure, and economic performance: the mediating role of carbon (media) legitimacy in the UK. *International Journal of Accounting and Economics Studies*, *9*(1), 8. https://doi.org/10.14419/ijaes.v9i1.31494

Schiemann, F., & Sakhel, A. (2019). Carbon Disclosure, Contextual Factors, and Information Asymmetry: The Case of Physical Risk Reporting. *European Accounting Review*, *28*(4), 791–818. https://doi.org/10.1080/09638180.2018.1534600

Stanny, E. (2013). Voluntary Disclosures of Emissions by US Firms. *Business Strategy and the Environment*, *22*(3), 145–158. https://doi.org/10.1002/bse.1732

Stanny, E., & Ely, K. (2008). Corporate environmental disclosures about the effects of climate change. *Corporate Social Responsibility and Environmental Management*, *15*(6), 338–348. https://doi.org/10.1002/csr.175

Sullivan, R., & Gouldson, A. (2012). Does voluntary carbon reporting meet investors' needs? *Journal of Cleaner Production*, *36*(January), 60–67. https://doi.org/10.1016/j.jclepro.2012.02.020

Tadros, H., & Magnan, M. (2019). How does environmental performance map into environmental disclosure?: A look at underlying economic incentives and legitimacy aims. *Sustainability Accounting, Management and Policy Journal*, *10*(1), 62–96. https://doi.org/10.1108/SAMPJ-05-2018-0125

Tang, S., & Demeritt, D. (2018). Climate Change and Mandatory Carbon Reporting: Impacts on Business Process and Performance. *Business Strategy and the Environment*, *27*(4), 437–455. https://doi.org/10.1002/bse.1985

Tang, Y., Shen, Y., Yang, Q., & Zhao, Z. (2019). Evaluation and Effect of Carbon Disclosure Quality in China: Based on the Perspective of Investor Protection. *Emerging Markets Finance and Trade*, *57*(9), 1–16. https://doi.org/10.1080/1540496X.2019.1680539

Tauringana, V., & Chithambo, L. (2015). The effect of DEFRA guidance on greenhouse gas disclosure. *British Accounting Review*, *47*(4), 425–444. https://doi.org/10.1016/j.bar.2014.07.002

Uyar, A., Karaman, A. S., & Kilic, M. (2020). Is corporate social responsibility reporting a tool of signaling or greenwashing? Evidence from the worldwide logistics sector. *Journal of Cleaner Production*, *253*, 119997. https://doi.org/10.1016/j.jclepro.2020.119997

Velte, P., Stawinoga, M., & Lueg, R. (2020). Carbon performance and disclosure: A

systematic review of governance-related determinants and financial consequences. *Journal of Cleaner Production*, *254*, 120063. https://doi.org/10.1016/j.jclepro.2020.120063

Wedari, L. K., Jubb, C., & Moradi-Motlagh, A. (2021). Corporate climate-related voluntary disclosures: Does potential greenwash exist among Australian high emitters reports? *Business Strategy and the Environment*, *30*(8), 3721–3739. https://doi.org/10.1002/bse.2836

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Original Research

A SARIMA Model for Forecasting Consumer Price Index in Tanzania

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Abstract

People must be well-informed on market swings in today's difficult economic times in order to cut excessive spending. Rising expenditures in a variety of sectors, including business, education, and healthcare can be burdensome for consumers, and accurate forecasting of household is necessary given the current technological innovation. The Consumer Price Index (CPI) is one of the statistical indicators used to estimate the changes in prices for commodities. Forecasting CPI can assist individuals in developing a plan for making decisions on their daily consumption. This study seeks to develop a SARIMA model for forecasting consumer price indices (CPI) in Tanzania by using data collected from International Monetary Fund (IMF) website from January 2010 to December 2022. Data were evaluated using time series methods such as time plots and stationarity tests. It was discovered that there is seasonality in the CPI index. However, a serial correlogram test was performed using a residual correlogram after which the variable was estimated using the SARIMA model and SARIMA (0, 1, 0) $(1, 1, 1)_{12}$ was fitted to the time series variable. The residual analysis was explored and because almost all correlations are zero, the SARIMA (1,1,1) $(0,1,2)_{12}$ model was appropriate for forecasting CPI index in Tanzania. Consumer price index was predicted for the next eighteen months and it has been observed that the trend of CPI is likely to increase in the next eighteen months.

Keywords: Correlogram, CPI, IMF.

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Introduction

Consumer Price Index (CPI) is an economic statistic that gives information on consumer-paid prices for goods and services. It is an instrument that is mostly used to measure inflation in the economy (Gjika Dhamo et al., 2018). The Consumer Price Index (CPI) provides an accurate measure of inflation that helps to estimate the purchasing power of the country given its currency and standard of living. (Zahara et al., 2020). The macroeconomic and fiscal policies of a government are greatly affected by the movement of the CPI, which also influences how the government adjusts expenditure and interest rates (Sibai et al., 2021). This has an impact on things like taxes and borrowing costs. For instance, the government may issue fewer social security checks when consumer price index falls and may raise interest rates in response to increase in CPI, thereby reducing borrowing costs and encouraging citizens to save more money rather than spending (Aparicio & Bertolotto, 2020). Consumer price index does not consider non-market activities, a broader quality of life issues, or the expenses and gains of the majority of government initiatives. Failure to use an inflation rate estimate may lead to inaccurate investment and saving decisions, which could eventually cause financial instability (Tang et al., 2019).

Failure to use an inflation rate estimate might lead to inaccurate investment and saving decisions, which could eventually cause economic instability (Zhao et al., 2020). Accurate CPI forecasting aids in decision-making for consumers and investors when it comes to spending and investment (Xu & Zhang, 2023). A job seeker who receives two offers that are comparable from companies in two separate regions may opt for the place with the lower CPI (Hadwan et al., 2022). It takes a lot of analysis of patterns and guesswork to anticipate the values of various variables, making forecasting a challenging task (Milunovich, 2020). The quality of the forecast is influenced by how accurate the data are used (Emong Herbert Robert & Mahmoud A. Abdel-Fattah, 2022). The choice of one forecasting approach over another may also be influenced by the accessibility of data (A et al., 2023).

Forecasting is important in the world of business when accurate forecasting results help the government to develop future policies (Corpin et al., 2023). Accurately predicting the change in the CPI is important for several economic variables, including efficiency, financial markets, and monetary policy (Wanto et al., 2018). Additionally, creating a reliable and accurate CPI forecasting model will be extremely important for the general public, decision-makers, and academics (Rohmah et al., 2021). Due to its importance in the economy, CPI prediction has attracted the interest of numerous scholars in recent years. The primary objective of this article is to develop SARIMA model for predicting consumer price index in Tanzania.

Statement of the problem

People must be well-informed on market swings in today's difficult economic times in order to cut excessive spending (Fahrudin & Sumitra, 2019). Rising expenditure in a variety of sectors, including business, education, and healthcare, can be burdensome for consumers thus, accurate forecasting of household expenses requires technological innovation (Wanjuki et al., 2022). Modelling and forecasting can assist individuals in

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developing a plan for making decisions on their daily consumption (S.-Y. Zhang et al., 2023).

Although many studies have used the ARIMA model to analyze and predict CPI with rather outstanding results, the author contends that the CPI as an economic cycle indicator contains obvious seasonal characteristics. The seasonal autoregressive moving average model (SARIMA) should be used since it can more closely match the CPI trend characteristics. Therefore, this study used monthly data from Tanzania to establish a SARIMA model for empirical analysis and forecasting, this will provide a definite reference for the decision-making of various market organizations, such as business entities.

Literature Review

Numerous studies have been carried out for CPI forecast analysis. However, an ideal model for consumer price index prediction has not yet been agreed upon by researchers.

In order to forecast the consumer price index (CPI), Konarasinghe (2022) looked for the optimal time series model. The International Monetary Fund (IMF) database was used to obtain monthly CPI figures for Thailand for the time period from May 2012 to October 2021. To predict CPI in Thailand, models like ARIMA, Holt's technique, and Auto-Regressive Distributed Lag Model (ARDLM) were tested. The model assumptions were examined using the Auto Correlation Function (ACF), Anderson Darling test, and Ljung-Box Q (LBQ) test. The capacity of the model to predict the future was evaluated using relative and absolute techniques in measurements of errors. The findings of the study showed that the ARDLM with lags 1 and 2 is the best model for predicting Thailand's CPI.

Time series data from January 2015 to December 2017 were used by Costales (2021) to study the Consumer Price Index of the Philippines. The researchers determined that SARIMA $(1,1,0)\ (1,0,0)_{12}$ is the best mathematical model for predicting future CPI values based on the AIC as criteria in selecting the best model.

In order to assess the potential ARIMA models' predictive power in Nigeria price index data, Ibrahim et al. (2023) used monthly data from January 2010 to August 2022 form the national Bureau of Statistics to examine the predictive ability of the possible ARIMA models. Based on the study ARIMA (1,2,0) from among the competing models was found to be effective for generating CPI forecasts.

Uwilingiyimana et al. (2015) used the ARIMA and GARCH models for conducting an inflation study in Kenya by using 180 monthly data values. The results demonstrated that, in comparison to GARCH (1,2) model, the ARIMA (1, 1, 12) model was able to create forecasts based on stationarity test and history patterns in the data. He went on to demonstrate that the model, when compared to earlier forecasting techniques, produced the best results and significantly increased estimation and forecasting accuracy.

In the case of Tanzania, Nyoni (2019) used ARIMA to forecast the inflationary trend. He discovered that the ARIMA models (1, 1, 2) had a better forecasting accuracy. According to Ngailo et al. (2014) who studied inflation using time series models with

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data from January 1997 to December 2010, the GARCH (1, 1) model is the best fit and most useful for forecasting inflation in Tanzania.

Methodology

The main objective of this research is to establish a SARIMA model for forecasting consumer price index in Tanzania. Forecasting is potential because it helps investors and the government in the energy sector to make informed decisions. Monthly CPI data from International monetary fund (IMF) website from January 2000 to February 2022 were analyzed by using R software in order to obtain the optimal model. The following sections provide a comprehensive description of each technique used.

Seasonal Autoregressive Integrated Moving Average (SARIMA) Models

SARIMA is an extension of the ARIMA model that fits seasonal time series data. Seasonality is defined as a consistent pattern of recurring movements throughout time in a given time series (Wanjuki et al., 2022). Most time-series data exhibit seasonality, rendering the ARIMA model inefficient in forecasting a specific series (Majhi et al., 2023). The seasonal ARIMA (SARIMA) model combines the Autoregressive and Moving Average terms in an ARIMA model that forecasts the given time series using historical values and noises, with lags (h) representing the series' periodicity. ARIMA (p, d, q) denotes the nonseasonal ARIMA part, where p is the order of the AR part, d is the order of differencing to keep data stationary, and q is the order of the MA part. As a result, the SARIMA model, which combines non-seasonal and seasonal components in a model, is abbreviated as ARIMA (p, d, q) (P, D, Q)h, where h denotes the number of seasons or the time span of the recurrent seasonal pattern (Mustapha et al., 2021).

$$\phi(\mathrm{B}^{\mathrm{h}})\varphi(\mathrm{B})(1-B^{s})^{D}(1-B)^{d}\mathrm{X}_{\mathrm{t}} - \mu = \theta(\mathrm{B}^{\mathrm{m}})\Theta(\mathrm{B})\varepsilon_{\mathrm{t}} \quad (1)$$

Where in (1), $\phi(\mathrm{B}^{\mathrm{h}})$ is the seasonal AR process, $\varphi(\mathrm{B})$ is the non-seasonal AR process, $\theta(\mathrm{B}^{\mathrm{m}})$ is the seasonal MA process, $\Theta(\mathrm{B})$ is the non-seasonal MA process, X_{t} is actual observation at time t, B is the backshift operator, ε_{t} is white noise, μ is the constant and h is the seasonal component's periodicity. The processes can be written using the backward shift operator as shown in (2), (3), (4) and (5):

$$\phi(B^{h}) = 1 - \phi_1 B^{h} - \phi_2 B^{2h} - \phi_3 B^{3h} - \cdots - \phi_{\mathrm{p}} B^{\mathrm{ph}} \quad (2)$$

$$\varphi(\mathrm{B})\mathrm{X}_{\mathrm{t}} = 1 - \varphi_1 \mathrm{X}_{\mathrm{t}-1} - \varphi_2 \mathrm{X}_{\mathrm{t}-2} - \varphi_3 \mathrm{X}_{\mathrm{t}-3} - \ldots - \varphi_{\mathrm{p}} \mathrm{X}_{\mathrm{t}-\mathrm{p}} \quad (3)$$

$$\theta(\mathrm{B}^{\mathrm{m}}) = 1 - \theta_1 B^{\mathrm{m}} - \theta_2 B^{2\mathrm{m}} - \theta_3 B^{3\mathrm{m}} - \ldots - \theta_{\mathrm{q}} B^{\mathrm{qm}} \quad (4)$$

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$$\Theta(B)\varepsilon_t = 1 - \Theta_1\varepsilon_{t-1} - \Theta_2\varepsilon_{t-2} - \Theta_3\varepsilon_{t-3} - \ldots - \Theta_q\varepsilon_{t-q} \quad (5)$$

Stationarity

Data must be examined for stationarity in time series analysis. A time series is said to be stationary if its mean and variance remain constant (Uwilingiyimana et al., 2015). A time plot or the Augmented Dickey Fuller (ADF) test can be used to test for stationarity. If the time series is proven to be stationary, the statistical properties will be the same in the future as they were in the past (Gjika Dhamo et al., 2018). The stationarity requirement ensures that the estimated model's autoregressive parameters remain constant within a defined range and that the moving average parameters are invertible. If this criterion is met, the estimated model can be used for forecasting (Fahrudin & Sumitra, 2019). To test for the unit root in the series, this study employs the Augmented Dickey-Fuller (ADF) test.

Box Jenkins Methodology

The Box Jenkins methodology approach was used in this study to carry out the modeling procedure which includes the stages of model identification, model specification, model estimation, and model diagnostics, as well as preliminary steps of checking for data stationarity and general model class specification (Rapoo et al., 2022). It involves the following steps

Model Identification and selection

Given that commodity prices are likely to exhibit a seasonal component as a result of seasonality in production or supply chains, the current study hypothesizes that the SARIMA model best fits the data under discussion. The SARIMA model is intended for time series with seasonality. It combines non-seasonal and seasonal components in the model and is denoted as ARIMA (p, d, q) $(P, D, Q)_h$, therefore selecting or specifying the appropriate model is critical as illustrated below.

Model selection involves selecting the model that best fits the available data. The principle of parsimony states that the model with the fewest parameters is preferred and employed. The first and most crucial step in modeling is determining the best order for the SARIMA (p, d, q) (P, D, Q) model (Koula et al., 2020). Orders p and q are determined by graphing ACF and PACF at different lag lengths whereas d is determined by the Integration (1) or Integration (0) approach (Divisekara et al., 2021). These two plots highlight the type of model we should develop.

Model Estimation

Following the identification of the model, the second stage in SARIMA model construction is the estimation of selected model parameters. The parameters were estimated using the maximum likelihood estimation (MLE) approach. Because the previous lagged observations of noise terms cannot be detected in a SARIMA framework,

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the MLE technique is adopted over Ordinary Least Squares (OLS) regression analysis due to its efficiency (Boniface & Martin, 2019).

Model Diagnostic

After estimating the parameters of the model, the next phase in Box-Jenkin's methodology is to assess the model's adequacy also known as model diagnostics. A model should be able to extract all systematic properties from data. The residuals (the percentage of the data not explained by the model) should be small. As a result, the diagnostic check is based on the residuals of the model. One notion is that the residuals of an acceptable model should be white noise. The residuals are known as Gaussian White Noise if they are normally distributed with a mean of zero and a constant variance (Dum & Essi, 2017).

Autocorrelation is another diagnostic test used in this study. A correlogram can be used to test the autocorrelation in the residuals. If there is no serial connection, autocorrelations and partial autocorrelations should be near to zero at all lags. To establish serial independence, a statistical method such as the Ljung Box Q statistic can be utilized. The Box-Pierce Q and Ljung-Box LB statistics were utilized in this study to determine the presence of serial correlations in the residuals (Magnus Ogolo & Lekia, 2022). The Box-Pierce Q statistics is denoted by (6).

$$Q_m = n(n+2)\sum_{k=1}^{m}\frac{{e_k}^2}{n-2} \qquad (6)$$

Where in (6) e_k indicates the residual autocorrelation at a given lag k, n is the number of residuals, and m the number of time lags. All Q-Statistics should be insignificant if there is no serial correlation between residuals (Chhorn & Chaiboonsri, 2018). Normality and homoscedasticity of residuals were tested by using statistical tools such as the Autoregressive Conditional Heteroskedastic Lagrange multiplier (ARCH-LM) (Gjika Dhamo et al., 2018).

Results and Discussion

Stationarity of the data

Figure 1 displays the plot of historical CPI index data from January 2000 to December 2022. The series shows an overall upward trend, given the seasonal component of the series, the SARIMA model is appropriate because it captures seasonality that exits in the series.

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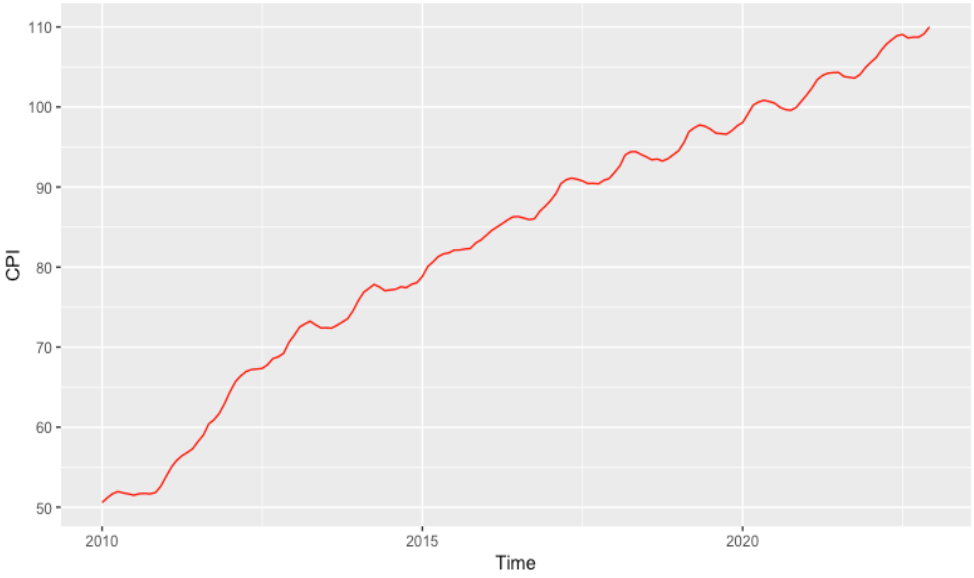

Figure 1. The trend of consumer price index

The Augmented Dickey-Fuller (Dickey-Fuller = -2.149, p-value = 0.5142) unit roots test revealed that the series was not stationary at level. The series became stationary after the first differencing and seasonal differencing at lag 12. The ADF test was applied to confirm whether the time series was stationary (Dickey-Fuller = -3.8388, p-value = 0.01914). Based on the results, D=1 in the seasonal ARIMA (P, D, Q) model and d=1 in non-seasonal ARIMA (p, d, q) case.

Model identification and selection

The order of the best fit can be chosen using the ACF and PACF, however it is not always accurate enough. In order to get the most efficient model from a combination of different orders having seasonal and non-seasonal parts, a grid search of feasible orders was use.

Table 1: SARIMA models using AIC

S/N	SARIMA MODEL	AIC
1	SARIMA $(0,1,0)\ (0,1,0)_{12}$	93.94685
2	SARIMA $(1,1,0)\ (1,1,0)_{12}$	36.58713
3	SARIMA $(0,1,1)\ (0,1,1)_{12}$	47.36842
4	SARIMA $(1,1,0)\ (0,1,0)_{12}$	39.20056
5	SARIMA $(1,1,0)\ (2,1,0)_{12}$	28.12904
6	SARIMA $(1,1,0)\ (2,1,1)_{12}$	25.50199
7	SARIMA $(1,1,0)\ (2,1,2)_{12}$	27.26475
8	SARIMA $(1,1,0)\ (1,1,2)_{12}$	25.16021
9	SARIMA $(1,1,0)\ (0,1,2)_{12}$	23.50938
10	SARIMA $(1,1,0)\ (0,1,1)_{12}$	30.97651

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S/N	SARIMA MODEL	AIC
11	SARIMA (0,1,0) $(0,1,2)_{12}$	72.39362
12	SARIMA (2,1,0) $(0,1,2)_{12}$	22.362
13	SARIMA (2,1,0) $(0,1,1)_{12}$	30.2588
14	SARIMA (2,1,0) $(1,1,2)_{12}$	24.20429
15	SARIMA (3,1,0) $(0,1,2)_{12}$	24.24369
16	SARIMA (2,1,1) $(0,1,2)_{12}$	24.10126
17	SARIMA (1,1,1) $(0,1,2)_{12}$	21.94772
18	SARIMA (1,1,1) $(0,1,1)_{12}$	30.0387
19	SARIMA (1,1,1) $(1,1,2)_{12}$	23.82919
20	SARIMA (0,1,1) $(0,1,2)_{12}$	40.52604
21	SARIMA (1,1,2) $(0,1,2)_{12}$	24.10491
22	SARIMA (0,1,2) $(0,1,2)_{12}$	31.53773
23	SARIMA (2,1,2) $(0,1,2)_{12}$	26.31055

The minimum AIC served as the basis for choosing the appropriate order of the best fit model. From table 1, SARIMA (1,1,1) (0,1,2)12 (AIC=21.94772) was the best model out of the 23 competing models.

Model Estimation

The model coefficients were estimated using the Maximum Likelihood Estimation method. The SARIMA (1,1,1) (0,1,2)12 comprises a non-seasonal AR process, a seasonal AR process, a non-seasonal MA process, two seasonal MA processes, a non-seasonal difference (d = 1), and a seasonal difference (D = 1). The fitted model's parameter estimates were; $\varphi_1 = 0.7557,\ \Theta = -0.3004,\ \theta_1 = -0.2933,\ \theta_2 = -0.3013.$ The mathematical equation of the resulting SARIMA (1,1,1) (0,1,2)12 model is given by (7)

$$(1 - 0.7557B)(1 - B^{12})(1 - \mathrm{B})\mathrm{X_t} = (1 + 0.3004B)(1 + 0.2933B^{s} + 0.3013B^{2s})\varepsilon_{\mathrm{t}} \quad (7)$$

Model Diagnostic Check

Diagnostic tests were carried out in this study, specifically to determine whether the residuals of the fitted model adhered to the assumptions of normality and autocorrelation. The model residuals need to be in independent and identically distributed with a constant mean and variance. There should not be autocorrelation between the residuals.

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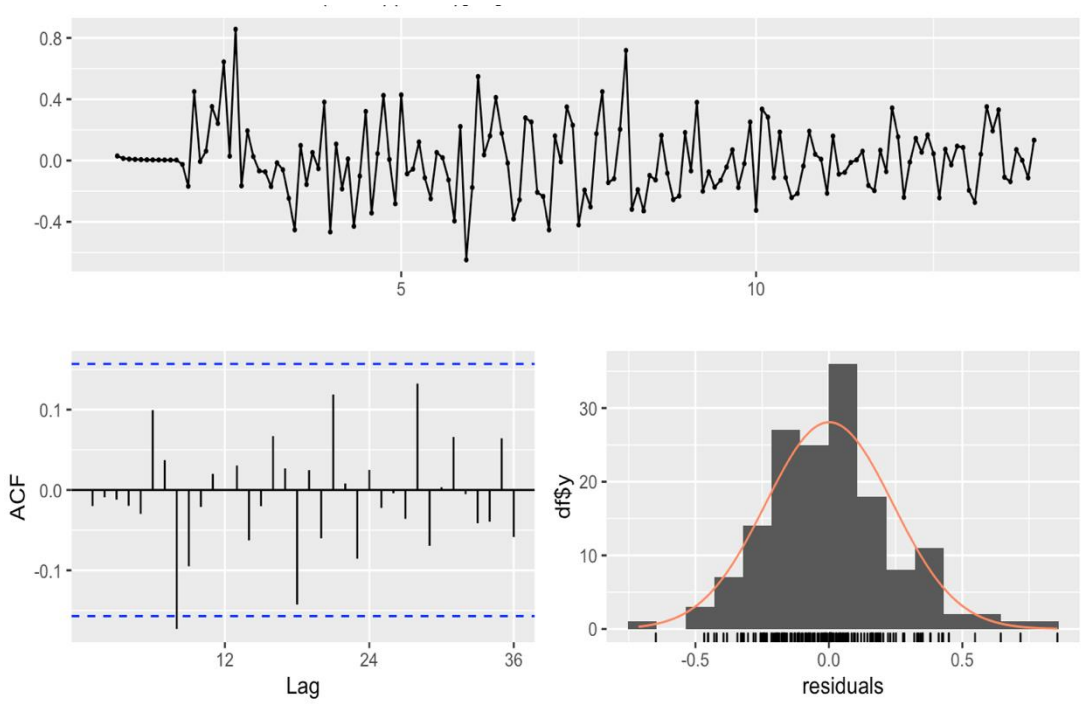

Figure 2. Residual plots

The normal curve in figure 2 indicates that the residuals have an approximately normal distribution. In addition, there is inadequate support for any significant spikes in the ACF plot as presented in figure 2. Thus, the autocorrelation between residuals is not significant. The Ljung-Box Q-test which displays Q-statistics (all $p > 0.05$) supports the conclusion. Furthermore, result indicates that fitting the ARCH model is unnecessary because residuals are only white noise, and the fitted SARIMA (1,1,1) (0,1,2)12 model can be used instead for forecasting.

Model prediction

Since forecasting provides an insight about the future variability, it aids in planning and decision-making. The CPI for the upcoming 18 months is predicted and examined using the SARIMA (1,1,1) (0,1,2)12 model. Table 2 displays specific data from predictive analysis and Figure 3 displays expected CPI index. The forecast shows that CPI has been rising over time and is probably going to continue to do so. The study's findings are in line with those of earlier research done by Lidiema (2017), Muthu et al., (2021), X. Zhang (2023) and Naden & Etuk (2017).

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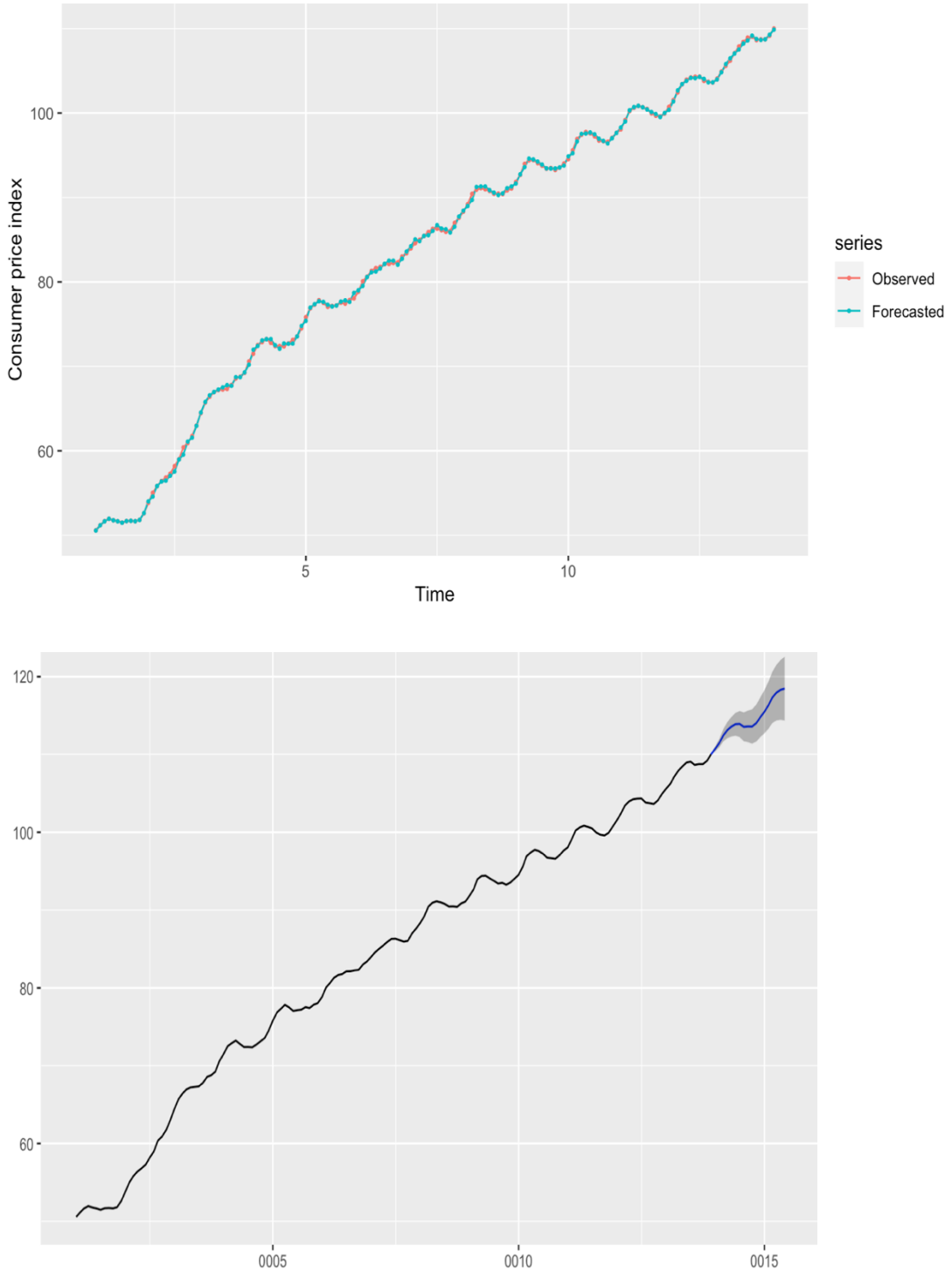

Figure 3. Observed Vs Forecasted

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Table 2. CPI forecast for the next 18 months

	Point Forecast	Lo 80	Hi 80	Lo 95	Hi 95
Jan 2023	110.6967	110.3795	111.0139	110.2115	111.1819
Feb 2023	111.4691	110.9090	112.0293	110.6124	112.3258
Mar 2023	112.4272	111.6274	113.2270	111.2040	113.6503
Apr 2023	113.1249	112.0922	114.1576	111.5455	114.7043
May 2023	113.5665	112.3100	114.8230	111.6449	115.4881
Jun 2023	113.8770	112.4071	115.3469	111.6290	116.1250
Jul 2023	113.9091	112.2364	115.5819	111.3509	116.4674
Aug 2023	113.5312	111.6659	115.3964	110.6785	116.3838
Sep 2023	113.5859	111.5378	115.6339	110.4537	116.7180
Oct 2023	113.5728	111.3511	115.7944	110.1750	116.9705
Nov 2023	113.9955	111.6086	116.3824	110.3451	117.6459
Dec 2023	114.7740	112.2296	117.3185	110.8827	118.6654
Jan 2024	115.4848	112.7078	118.2617	111.2378	119.7317
Feb 2024	116.3403	113.3075	119.3732	111.7020	120.9787
Mar 2024	117.3240	114.0242	120.6239	112.2774	122.3707
Apr 2024	117.9392	114.3695	121.5089	112.4799	123.3985
May 2024	118.2921	114.4549	122.1292	112.4236	124.1605
Jun 2024	118.4535	114.3541	122.5529	112.1840	124.7230

Conclusion and Recommendation

Conclusion

Central banks design and implement monetary policy such as interest rate setting and price controls based on the future course of market prices. As a result, forecasting models have become popular in policy development. This study applied Box-Jenkins methodology to develop a predictive SARIMA model for monthly CPI data in Tanzania from January 2000 to December 2022. The results revealed that SARIMA $(1,1,1)\ (0,1,2)_{12}$ (AIC = 21.94772) was the best in the class of 23 competing SARIMA models.

Recommendation and Areas for further studies

Because the Consumer Price Index (CPI) keeps increasing, the government should use fiscal tools such as interest rate caps, reduced government spending, and sustainable taxes to control inflation.

Future research may look into hybrid models like SARIMA and machine learning techniques such as Support Vector Regressor (SVR) and Random Forest Regressor (RFR) that incorporate covariates to improve the prediction of consumer price index. To account for additional volatility in commodity prices, the SVR model incorporate consumer price index predictors such as interest rates and taxes.

References

A, M. Adnan., J, P. I., & S, R. M. (2023). Forecasting Consumer Price Index (CPI) Using Deep Learning and Hybrid Ensemble Technique. *2023 International Conference on Advances in Computing, Communication and Applied Informatics (ACCAI)*, 1–8. https://doi.org/10.1109/ACCAI58221.2023.10200153

Aparicio, D., & Bertolotto, M. I. (2020). Forecasting inflation with online prices. *International Journal of Forecasting*, *36*(2), 232–247. https://doi.org/10.1016/j.ijforecast.2019.04.018

Boniface, A., & Martin, A. (2019). Time Series Modeling and Forecasting of Consumer Price Index in Ghana. *Journal of Advances in Mathematics and Computer Science*, 1–11. https://doi.org/10.9734/jamcs/2019/v32i130134

Chhorn, T., & Chaiboonsri, C. (2018). Modelling and Forecasting Tourist Arrivals to Cambodia: An Application of ARIMA-GARCH Approach. *Journal of Management, Economics and Industrial Organization*, 1–19. https://doi.org/10.31039/jomeino.2018.2.2.1

Corpin, S. J. T., Marbella, J. N. P., Kua, S. J. J., Mabborang, R. C., & Lamprea, C. T. (2023). Forecasting Inflation Rate in the Philippines Using Seasonal Autoregressive Integrated Moving Average (SARIMA) Model. *European Journal of Computer Science and Information Technology*, *11*(2), 13–36. https://doi.org/10.37745/ejcsit.2013/vol11n21336

Costales, J. A. (2021). Cost Modeling and Analysis of the Consumer Price Index in the Philippines. *2021 10th International Conference on Software and Computer Applications*, 32–38. https://doi.org/10.1145/3457784.3457836

Divisekara, R. W., Jayasinghe, G. J. M. S. R., & Kumari, K. W. S. N. (2021). Forecasting the red lentils commodity market price using SARIMA models. *SN Business & Economics*, *1*(1), 20. https://doi.org/10.1007/s43546-020-00020-x

Dum, Z., & Essi, I. D. (2017). *Modeling Price Volatility of Nigerian Crude Oil Markets Using GARCH Model: 1987-2017*. *3*(4).

Emong Herbert Robert, A. M. M., & Mahmoud A. Abdel-Fattah. (2022). Evaluation of a Functional Time Series Model for Forecasting Inflation in Uganda. *Journal of Statistics Applications & Probability*, *11*(2), 523–534. https://doi.org/10.18576/jsap/110213

Fahrudin, R., & Sumitra, I. D. (2019). Forecasting Inflation Using Seasonal Autoregressive Integrated Moving Average Method for Estimates Decent Living Costs. *IOP Conference Series: Materials Science and Engineering*, *662*(2), 022062. https://doi.org/10.1088/1757-899X/662/2/022062

Gjika Dhamo, E., Puka, L., & Zaçaj, O. (2018, September 6). Forecasting Consumer Price Index (Cpi) Using Time Series Models And Multi Regression Models

(Albania Case Study). *10th International Scientific Conference "Business and Management 2018."* Business and Management 2018, Vilnius Gediminas Technical University, Lithuania. https://doi.org/10.3846/bm.2018.51

Hadwan, M., M. Al-Maqaleh, B., N. Al-Badani, F., Ullah Khan, R., & A. Al-Hagery, M. (2022). A Hybrid Neural Network and Box-Jenkins Models for Time Series Forecasting. *Computers, Materials & Continua*, *70*(3), 4829–4845. https://doi.org/10.32604/cmc.2022.017824

Ibrahim, A., Sani, U. M., & Olokojo, V. O. (2023). Forecasting Consumer Price Index and Exchange Rate Using Arima Models: Empirical Evidence from Nigeria. *Fudma Journal of Sciences*, *6*(6), 114–124. https://doi.org/10.33003/fjs-2022-0606-1136

Konarasinghe, K. M. U. B. (2022). *Modeling Consumer Price Index of Thailand*. https://doi.org/10.5281/ZENODO.5876872

Koula, J., Tiho, T., & Christophe Chiapo, A. (2020). On the Analysis and Modelling of the Harmonized Consumer Price Indices of West African Economic and Monetary Union Member States. *American Journal of Theoretical and Applied Statistics*, *9*(6), 283. https://doi.org/10.11648/j.ajtas.20200906.14

Lidiema, C. (2017). Modelling and Forecasting Inflation Rate in Kenya Using SARIMA and Holt-Winters Triple Exponential Smoothing. *American Journal of Theoretical and Applied Statistics*, *6*(3), 161. https://doi.org/10.11648/j.ajtas.20170603.15

Magnus Ogolo, I., & Lekia, N. (2022). Univariate Time Series Analysis of Consumer Price Index on Food and Non-alcoholic Beverages. *Journal of Mathematical Sciences & Computational Mathematics*, *3*(4), 416–440. https://doi.org/10.15864/jmscm.3402

Majhi, S. K., Bano, R., Srichan, S. K., Acharya, B., Al-Rasheed, A., Alqahtani, M. S., Abbas, M., & Soufiene, B. O. (2023). *Food price index prediction using time series models: A study of Cereals, Millets and Pulses* [Preprint]. In Review. https://doi.org/10.21203/rs.3.rs-2999898/v1

Milunovich, G. (2020). Forecasting Australia's real house price index: A comparison of time series and machine learning methods. *Journal of Forecasting*, *39*(7), 1098–1118. https://doi.org/10.1002/for.2678

Mustapha, M., Seri, M., & Abubakar, Z. M. (2021). *Forecasting Nigeria's Inflation Using Sarima Modeling*.

Muthu, N. S., Kannan, K. S., Deneshkumar, V., & Thangasamy, P. (2021). SARIMA Model for Forecasting Price Indices Fluctuations. *European Journal of Mathematics and Statistics*, *2*(6), 1–6. https://doi.org/10.24018/ejmath.2021.2.6.67

Naden, T. P., & Etuk, E. H. (2017). *Sarima Modeling of Nigerian Food Consumer Price Indices*. *2*(4).

Ngailo, E., Luvanda, E., & Massawe, E. S. (2014). Time Series Modelling with Application to Tanzania Inflation Data. *Journal of Data Analysis and Information Processing*, *02*(02), 49–59. https://doi.org/10.4236/jdaip.2014.22007

Nyoni, T. (2019). *Modeling and forecasting inflation in Tanzania using ARIMA models*. https://mpra.ub.uni-muenchen.de/92458/

Rapoo, M. I., Chanza, M. M., & Motlhwe, G. (2022). Inflation Rate Modelling Through a Hybrid Model of Seasonal Autoregressive Moving Average and Multilayer Perceptron Neural Network: In I. R. Management Association (Ed.), *Research Anthology on Macroeconomics and the Achievement of Global Stability* (pp. 551–567). IGI Global. https://doi.org/10.4018/978-1-6684-7460-0.ch030

Rohmah, M. F., Putra, I. K. G. D., Hartati, R. S., & Ardiantoro, L. (2021). Comparison Four Kernels of SVR to Predict Consumer Price Index. *Journal of Physics: Conference Series*, *1737*(1), 012018. https://doi.org/10.1088/1742-6596/1737/1/012018

Sibai, F. N., Asaduzzaman, A., El-Moursy, A., & Sibai, A. (2021). *Forecasting the Consumer Price Index: A Comparative Study of Machine Learning Methods*.

Tang, X., Wang, L., Cheng, J., & Chen, J. (2019). *Forecasting model based on information-granulated GA-SVR and ARIMA for producer price index*. https://doi.org/10.48550/ARXIV.1903.12012

Uwilingiyimana, C., Munga'Tu, J., & Harerimana, J. de D. (2015). *Forecasting Inflation in Kenya Using Arima—Garch Models*. *3*(2).

Wanjuki, T. M., Wagala, A., & Muriithi, D. K. (2022). Evaluating the Predictive Ability of Seasonal Autoregressive Integrated Moving Average (SARIMA) Models using Food and Beverages Price Index in Kenya. *European Journal of Mathematics and Statistics*, *3*(2), 28–38. https://doi.org/10.24018/ejmath.2022.3.2.100

Wanto, A., Fauzan, M., Suhendro, D., Parlina, I., Damanik, B. E., Siregar, P. A., & Hidayati, N. (2018). Epoch Analysis and Accuracy 3 ANN Algorithm using Consumer Price Index Data in Indonesia: *Proceedings of the 3rd International Conference of Computer, Environment, Agriculture, Social Science, Health Science, Engineering and Technology*, 35–41. https://doi.org/10.5220/0010037400350041

Xu, X., & Zhang, Y. (2023). Retail Property Price Index Forecasting through Neural Networks. *Journal of Real Estate Portfolio Management*, *29*(1), 1–28. https://doi.org/10.1080/10835547.2022.2110668

Zahara, S., Sugianto, & Ilmiddaviq, M. B. (2020). Consumer price index prediction using Long Short Term Memory (LSTM) based cloud computing. *Journal of*

Physics: Conference Series, *1456*(1), 012022. https://doi.org/10.1088/1742-6596/1456/1/012022

Zhang, S.-Y., Lin, Z., & Yhang, W.-J. (2023). Forecasting CPI of restaurants and hotels in Korea using the seasonal autoregressive integrated moving average (SARIMA) model. *International Journal of Tourism and Hospitality Research*, *37*(4), 85–94. https://doi.org/10.21298/IJTHR.2023.4.37.4.85

Zhang, X. (2023). Forecast and Analysis of China's CPI Based on SARIMA Model. In D. Qiu, Y. Jiao, & W. Yeoh (Eds.), *Proceedings of the 2022 International Conference on Bigdata Blockchain and Economy Management (ICBBEM 2022)* (Vol. 5, pp. 1354–1361). Atlantis Press International BV. https://doi.org/10.2991/978-94-6463-030-5_135

Zhao, L. L., Wang, B., Mbachu, J., & Egbelakin, T. (2020). Using artificial neural networks to forecast producer price index for New Zealand. *International Journal of Internet Manufacturing and Services*, *7*(3), 191. https://doi.org/10.1504/IJIMS.2020.107944

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Conceptual Paper

Impact of Cultural Intelligence and Learning Styles on Leadership Effectiveness: A Conceptual Analysis

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Abstract

The study has reviewed a significant number of research articles to examine the effects of cultural intelligence and learning styles on leadership effectiveness. Almost all the articles reviewed were empirical in nature and few conceptual papers were reviewed as well. Fifteen (15) relevant research were reviewed to establish the theoretical proposition of the effect of cultural intelligence on leadership effectiveness, while another fifteen (15) articles were reviewed to examine the effect of learning style on leadership effectiveness. Most of the reviewed papers indicated that cultural intelligence and learning style has significant positive effects on leadership effectiveness. From the review, it was also found that there is lack of studies examining learning style effect on leadership effectiveness particularly in pharmaceutical sector. This study will contribute by establishing the link between cultural intelligence, learning style and leadership effectiveness simultaneously. Also, this study will be able to use to design the training and development programs to enhance, cultural intelligence and to adopt appropriate learning style to improve leadership effectiveness in commercial enterprise sector, particularly in Malaysia.

Keywords: Cultural Intelligence, Leadership Effectiveness, Learning Style.

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Introduction

Leadership effectiveness is crucial, especially in the current dynamic business environment and leaders need to utilise their CQ to improve their performance and their employees' productivity (Richard-Eaglin, 2021; Afsar, Shahjehan, Shah & Wajid, 2019). The intense competition faced by organisations in their operating context demands leaders to be highly effective in terms of productivity and fast decision making (Ali & Anwar, 2021a; Warrick, 2017). In order to be effective, leaders are expected to ensure their subordinates are committed and motivated to face the challenges of changes (Ali & Anwar, 2021b; Owens & Hekman, 2016). It is pivotal for leaders to continuously enhance their CQ to improve leadership effectiveness by adopting appropriate learning styles to make fast and timely decisions (Davidaviciene & Al Majzoub, 2022; Reyes, 2021; Nam & Park, 2019). Similarly, to compete effectively, the CQ must be improved in order to enhance the memory and knowledge base to avoid making mistakes during decision making at various locations of the world (Hassan, Osman-Gani & Hamid, 2022; Presbitero, 2020; Hassan, Basit & Sethumadavan, 2020). CQ is considered as an important factor that could improve learning to improve leadership effectiveness (Velarde, Ghani, Adams & Cheah, 2022; Osman-Gani & Hassan, 2018).

Recent studies found that leadership effectiveness is important in pharmaceutical sector as leader's behaviours play an important role improving employee performance and their satisfaction (Zadeh, Hackney & Zeng, 2022; Hidayati & Zainurossalamia, 2020; Sultana, Tarofder, Darun, Haque & Sharief, 2020; Haider, Nisar, Baig & Azeem, 2018). Since leaders who assume the headship of their organization, they have a prime position in the development and performance of their respective organizations (Guarana & Avolio, 2022). According to Burnes, Hughes and By (2018), changes in organizational structure, vision and leadership are unavoidable in any organization (Abbas, Ekowati & Suhariadi, 2021). The leadership style of a leader is individualistic, and it is distinctly different from other individuals in an organization (Sims, Carter & Peralta, 2021; Koo & Park, 2018). It separates a leader from another and it is this authoritative power that drives employee's performance, especially in the pharmaceutical sector. It is thus important that leadership teams at pharmaceutical sector build their capacity as strong leaders to be able to lead their team members towards achieving their organizational goals and vision (Hamid,Widodo & Buchdadi 2022; Yuan & Lo, 2018). Furthermore, it is crucial for leaders to instil confidence in each of their team members through CQ (Davidaviciene & Al Majzoub, 2022; Dibble, Henderson & Burns, 2019). Thus, it is very important for a leader in a diverse environment to be able to adapt to cultural differences and bring together different styles and attributes to form his/her strategy for success (Charoensukmongkol, 2021; Weber, Sadri & Gentry, 2018; Mui, Basit & Hassan, 2018). A truly experienced leaders must know how to use CQ and LS to drive the organisation forward and achieve challenging targets without neglecting specific cultural attributes (Reyes, 2021; Solomon & Steyn, 2017). Research shows that the effect of national cultures on organisational cultures or local cultures are highly influential to effect on business environments (Lopes & Boyadjian, 2021; Khan & Panarina, 2017), and in addition it was argued that greater differences in organisational attributes and practices exist when companies face great cultural distance between the two countries (Lopes & Boyadjian, 2021; Shao, Bouzdine-Chameeva & Lunardo, 2020). Some researchers have substantiated the need to focus on enhancing leadership

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effectiveness, particularly on improving sales, marketing and operational leaders' effectiveness by improving CQ through LS to grow the firm 's revenue (Velarde et al., 2022; Charoensukmongkol & Phungsoonthorn, 2022; Hassan et al., 2020; Basit et al., 2020).

It is crucial to have highly capable, effective, smart and high-performing leaders or leaders to ensure a firm's business sustainability (Ali & Anwar, 2021a; Blanchard, 2018; Mui et al., 2018). However, there are several management issues and operational challenges facing firms today in using leaders, particularly sales and marketing leaders (Ali & Anwar, 2021b; Hassan et al., 2020). Managing and motivating sales and marketing leaders are challenging tasks and require a huge amount of time, money and effort (Zadeh et al., 2022; Hohenberg & Homburg, 2016). Hence, leaders' performance warrants rigorous examination when studying factors affecting a pharmaceutical company's performance (Zadeh et al., 2022; Ugbam & Okoro, 2017). In Malaysia, it is evident that there is lack of empirical research done so far to examine the mediating effect of LS on relationship between CQ and LE (Rahman et al., 2022; Basit, Sethumadevan & Hassan, 2020). In terms of CQ, much research in the past indicated that the cultural diversity for multicultural domestic work teams (Rahman et al., 2022; Osman-Gani & Hassan, 2018), multinational work teams (Hamid et al., 2022; Iskhakova & Ott, 2020), global leaders (Davidaviciene & Al Majzoub, 2022; Jiang, Le & Gollan, 2018) and those in overseas work assignments (Charoensukmongkol & Phungsoonthorn, 2022; Furnham, 2017) were important cultural elements to enhance the leadership effectiveness. However, the available literature lacks to evaluate the effect of CQ on leadership effectiveness among pharmaceutical leaders, both in Malaysia as well as in the global context (Rahman et al., 2022; Basit et al., 2020). Current literature pertaining to CQ in Malaysia shows only handful of published articles, which had investigated the effects of CQ on job performance and/or job adjustment among expatriates in Malaysia (Rahman et al., 2022; Hassan et al., 2020; Ramalu & Subramaniam, 2019; Malek & Budhwar, 2013).

In previous studies, it is evident that less emphasis was made in understanding the effect of CQ and LS on leadership effectiveness in the Western countries as well. Most of the studies focus on cultural intelligence and leadership style (Gill, 2021; Hatane et al., 2021; Kua & Lee, 2021; Zaman et al., 2021; Solomon & Steyn, 2017; Aldhaheri, 2017; Solomon & Steyn, 2017a) while there were only limited studies on examining the impact of CQ on leadership effectiveness in commercial sectors (Gill, 2021; Ashley, 2020; Solomon & Steyn, 2017). Very few studies focus on examining the effect of cultural intelligence on learning style (Hatane et al., 2021; Kurpis & Hunter, 2017; Li, Mobley & Kelly, 2013) and learning style on leadership effectiveness in pharmaceutical or commercial enterprises are very limited (Kua & Lee, 2021; Akyürek & Guney, 2018; Zumitzavan, 2011; Joy & Kolb, 2009). But the limited studies done to examine the effect of CQ on leadership effectiveness and LS on leadership effectiveness in developing countries have been producing inconsistent results due to differences in socio-cultural background, income, and culture (Zaman et al., 2021; Kouzes & Posner, 2018; Piercy, Low & Cravens, 2011). Since the focus of CQ and LS on leadership effectiveness were not sufficiently addressed, particularly in pharmaceutical industry, it would be worthwhile to conduct an empirical study to understand the effects of CQ and LS on leadership effectiveness. Based on the above-mentioned issues and problems, this study seeks to bridge the research gaps, and thereby aims to contribute to the existing body of

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knowledge on leadership effectiveness. The present study attempts to conduct a systematic review by conceptualising the effect of CQ and LS on leadership effectiveness.

From the above reviews, it is clearly evident that the past research mainly focused on examining the effects of CQ on leadership effectiveness (Basit et al., 2020; Ahmad & Saidalavi, 2019; Osman-Gani & Hassan, 2018; Pacheco & Stevens, 2018). Basit et al (2020) covered the two aspects of CQ and Learning Style on leadership effectiveness. However, their study was a conceptual analysis on the banking sector. This needs to be further investigated by empirically testing the propositions made in their study. Similarly, this conceptual analysis is further review more empirical based studies and explored in pharmaceutical sector-based literature. Since Learning style is mainly studied or tested in academic sector along with students and teachers' learning style and its effect on academic achievement or performance (Ata & Cevik, 2019; Akyürek & Guney, 2018; Labib, Canós & Penadés, 2017; Turesky & Gallagher, 2011)

This shows that there is very little or limited research done to establish the simultaneous effect of CQ and LS on leadership effectiveness, especially in the pharmaceutical sector. Therefore, this study could be one of the pioneering studies that will examine the effect of CQ and LS on leadership effectiveness in commercial sector. This study will enable us to put emphasis on the importance of CQ and LS in enhancing leadership effectiveness.

Literature Review

Cultural Intelligence

CQ is a collection of mental, motivational and behavioural abilities (Idrus, 2021; Presbitero,2016). Also, it was reported that CQ is distinct from emotional and other intelligences in that such intelligences are culture constrained (Akpan & Inyang, 2022; Thomas, Elron, Stahl, Ekelund, Ravlin, Cerdin & Maznevski, 2008) as they do not transfer across the cultural spectrum. One of the key definitions of CQ is 'an individual's capability to function and manage effectively in culturally diverse settings' (Ang, Van Dyne, Koh, Ng, Templer, Tay & Chandrasekar, 2007, p.337). Also, CQ is defined as 'ability to adapt effectively to new cultural settings' (Ng & Earley, 2006, p.7). Alternatively, CQ is referred to as 'individual's capability to detect, assimilate, reason, and act on cultural cues appropriately in situations characterised by cultural diversity' (Earley & Ang, 2003, p.297). On the other hand, CQ was defined as awareness and motivation about cultural differences to provide rooms for adaptation and adjustments where necessary (Akpan & Inyang, 2022; Van Dyne, Ang, Ng, Rockstuhl, Tan & Koh, 2012).

Leadership effectiveness

Yukl, Mahsud, Prussia and Hassan (2019) and Louw, Muriithi and Radloff (2017) described leadership effectiveness as a process of interaction to influence subordinates and colleagues to attain the desired goal through effective dialogue with the employees and agreement with them on ways of achieving it (Singh, 2021). Similarly, leadership effectiveness is all about achieving a shared objectives by influencing one or many to

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accomplish the objectives (Sims et al., 2021; Islam, Osman, Othman & Raihan, 2019). As accomplishing shared objectives by influencing one or many individuals who are willing and convinced to work for accomplishment of the objectives (Singh, 2021; Müller, Pintor & Wegge, 2017). Bass and Stogdill (2018) have worked on more than thousand definitions of leadership effectiveness and have resolute that effectiveness of leadership largely focuses on measurability of productivity and achievement of shared goals (Singh, 2021). Also, leadership effectiveness is about applying the appropriate leadership style in given situations (Kwiotkowska, Wolniak, Gajdzik & Gębczyńska, 2022; Lor & Hassan, 2017). More recently Kouses and Posner (2018) argued that the leadership effectiveness comprises of five exemplary practices such as challenge the process, inspire a shared vision, enable others to act, model the way, and encourage the heart. The leadership effectiveness was conceptualised in relation to emotional intelligence by Osman-Gani, Anwar and Hamid (Osman-Gani, Anwar & Hamid, 2017). Much earlier than this, Osman-Gani and Rockstuhl (2009) have discussed leaders' adjustment in cross cultural setting and how such adaptation could affect leadership effectives. Ajanaku and Lubbe (2021), Basit et al (2020) as well Osman-Gani and Hassan (2018) have proposed the revised leadership effectiveness model which was originally developed by Kouzes and Posner (1995) and was considered as one of the most relevant and appropriate leadership effectiveness models.

Learning Style

The debate about learning styles has been ongoing for more than decades (Alonso-Martín et al., 2021; Husmann & O'Loughlin, 2019). Early definition of learning style stated that "learning styles are cognitive, affective, and physiological traits that serve as relatively stable indicators of how learners perceive, interact with, and respond to learning environment" (Keefe,1982, p.2). Research into learning styles was originally associated with the theoretical domain of psychology (Wong, 2022; Barry & Egan, 2018; Felder & Silverman, 1988). Also, learning style is defined as a preference method of study, attitude, and strength of student in receive data and process data (Gayef, Çaylan & Temiz, 2023; Felder & Silverman, 1988). Kolb (1984) had opinion that learning style is defined a person regular or specific interest way in receiving develop new knowledge in these areas. Leaders' and managers' learning orientation towards some of the Kolb's learning dimensions such as abstract conceptualisation over concrete experience was related to the increased self-efficacy beliefs (Özdemir & Hastürk, 2021; Yamazaki, Toyama & Ubed, 2018). Where managers' orientations towards active experimentation over reflective observation was associated with general self-efficacy development but had a marginal influence on career management self-efficacy (Taneja, Kiran & Bose, 2023; Yamazaki et al., 2018).

Analysis of Relevant Theories

In terms of related theories in explaining the three key concepts, five exemplary leadership practices were the most dominant leadership effectiveness theory widely adopted among the scholars (Kouzes & Posner, 2018). These five (5) practices are mostly considered as an advocate of transformational leadership and Kouzes and Posner (2018) investigated in-depth what transformational leaders do when they are at their best. The five (5) exemplary practices of leadership include Modelling the Way, inspiring a Shared

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Vision, Challenging the Process, Enabling Others to Act, and Encouraging the Heart (Kouzes & Posner, 1995).

There are several reasons why the Leadership Practices Inventory (LPI) is the most relevant framework to assess leadership effectiveness. First, the construct of Kouzes and Posner's (1995) leadership model is grounded on their five-year extensive research involving thousands of high-performing leaders and their followers (Kouzes & Posner, 2021; Kouzes & Posner, 2018). Second, many researchers have well received this model as truly representing the highly effective leadership practice (Zaini & Mansor, 2021; Osman-Gani & Hassan, 2020; Basit et al., 2020). Third, the Five Practices of Exemplary Leadership provides a framework for the development of a reliable and validated instrument to measure effective leadership, which is the Leadership Practices Inventory (Kouzes & Posner, 2021). In a review article investigating the reliability and validity of the Leadership Practices Inventory concluded that the leadership Practices Inventory is essentially robust and practical in a variety of settings and populations (Posner, 2016; Kouzes & Posner, 2016; 2017; 2019). Fourth, the leadership effectiveness measured by Leadership Practice Inventory (LPI) of Kouzes and Posner's was examined to determine the professional development of managers (Zaini & Mansor, 2021). Therefore, this study adopted Kousez and Posner's LPI as it was widely adopted and applied to assess leadership effectiveness in diverse settings, including pharmaceutical sector.

In terms of cultural intelligence, On the other hand, according to Sternberg (2018) intelligence is inherent in different loci within individuals. Based on the insights from the prior intelligence research, the cultural intelligence model. Earley and Ang (2003) proposed that cultural intelligence is a multi-faced aggregate construct and consists of four factors: (1) meta-cognitive cultural intelligence, which refers to an individual's higher mental thought capability to acquire cultural knowledge; (2) cognitive cultural intelligence, which refers to an individual's knowledge of cultures and intercultural variations; (3) motivational cultural intelligence, which refers to an individual's intrinsic energy that directed towards functioning in intercultural contexts; and (4) behavioural cultural intelligence, which refers to an individual's capability for flexibility in his behaviours during intercultural interactions. Both meta-cognitive and cognitive cultural intelligence are the intellectual elements of cultural intelligence, and therefore apply in developing the aspects that flow from different cultural experiences. The cultural intelligence model of Earley and Ang (2003) is relevant and important to this study for the following reasons. First, this cultural intelligence model describes a general set of capabilities that facilitate an individual's potential to perform effectively even in different unfamiliar intercultural settings (Fu & Charoensukmongkol, 2023; Ott & Michailova, 2018; Ang et al., 2007). Second, it is a theoretically coherent model that provides a parsimonious framework for intercultural functional capabilities, sparing various narrower distal dimensions such as planning, self-awareness (Pidduck, Shaffer, Zhang et al., 2022; Ang, Rockstuhl & Tan, 2015). Third, this cultural intelligence model takes into account all four factors simultaneously to encompass the cultural capabilities domain (Paiuc, 2021; Ramsey, Abi Aad, Jiang, Barakat & Drummond, 2016) while other cultural competency models differ in scope and fail to incorporate all the four factors. Fourth, the twenty-item four factors Cultural Intelligence Scale (CQS) developed by Ang et al., (2007) fulfils both the criteria as it generalises across different settings (Stoermer, Davies & Froese, 2021). It has been adopted in various empirical research extensively, i.e.,

multiple student or executive samples, a vast number of countries (including United States, Switzerland, South Korea, and Turkey), repeated measurements with time interval up to four months, multicultural teams' settings, and multicultural samples (Ang et al., 2015). Sixth, the cultural intelligence model has significant rigorous psychometric properties and proven construct validity (Soffer-Dudek et al., 2021; Ang et al., 2020). Seventh, several scholars have appreciated that the construct of cultural intelligence provides a practical framework for intercultural application and capabilities (Chen, Yang, Liu et al., 2023; Stoermer et al., 2021; Ang et al., 2020; Hassan et al., 2020; Basit et al., 2020; Osman-Gani & Hassan, 2018). Moreover, the cultural intelligence of Earley and Ang (2003) were studied in association with leadership effectiveness by many scholars in the past (Fu & Charoensukmongkol, 2023; Charoensukmongkol & Phungsoonthorn, 2022; Davidaviciene & Al Majzoub, 2022; Charoensukmongkol, 2021). The four cultural intelligence elements such as metacognitive, cognitive, motivational and behavioural cultural intelligence were studied and have established its causal influence on leadership effectiveness (Khemakhem, 2023; Velarde et al., 2022; Licki& Van Der Walt, 2021). Therefore, the cultural intelligence model of Earley and Ange (2003) model is considered as one of the most appropriate and relevant models to study cultural intelligence in relation to leadership effectiveness.

In terms of learning theories, the experimental learning style of Kolb (1984) was adopted as one of the key determinants of leadership effectiveness. Kolb has introduced the theories of four stage learning cycle that indicates learning is deemed to be a continuous and interactive process (Kolb, 1976). The four stages of learning cycle are the four learning orientations form two orthogonal bipolar dimensions of learning (Kolb, 1984). Firstly, comprehension tends to be information obtained from experience; it consists by bipolar orientations from Concrete Experience to Abstract Conceptualisation. Next, the second dimension described is transformation, which is the process of transformation of information received. It constitutes Active Experimentations and Reflective Observation (Kolb & Kolb, 2005). Kolb (1984)'s experimental learning style framework was adopted for the following reasons: (1) Kolb's theory is an established theory as a learning theory that confirms the key aspects of active learning (Song & Park, 2021; Hasnine, Ahmed & Ueda, 2021, July). (2) It gives theoretical claim of independent learning, learning by performing, problem-based learning and work-based learning (Fergusson, 2022). (3) Kolb's learning theory has a substantial range of applications, including helping individuals recognise themselves, helping the leaders become reflexive leaders, identifying learning styles of subordinates, and development of key leader's skills (Fergusson, 2022; Aksan, 2021). (4) Also, Kolb's learning theory helps in development of teamwork or project work (Rossetti, 2023; Wong, Ko, Nam et al., 2022). (5) Furthermore, Kolb's learning theory helps deciding ways that information and communication technologies can assist the process of learning (Saputra & Hadi, 2023; Chiu, Hwang & Hsia, 2023; Nozaleda, 2021). Moreover, Kolb's learning theory has the following benefits over other learning theories.

- ✓ Gives ready guidance or instruction for application (AbuKhousa, El-Tahawy& Atif, 2023)
- ✓ Gives instruction or guidelines for the necessary range of workplace learning methods (AbuKhousa et al., 2023; Mayombe, 2023).

- ✓ Provide a strong link between theory and practice: Offers a theoretical proposition of things that many trainers and instructors apply and need advice on how to improve their practice (Wijnen-Meijer, Brandhuber, Schneider & Berberat, 2022)
- ✓ Clearly formulates the importance of employees to reflect and the importance of providing feedback in order to enhance their performance (Rossetti, 2023)
- ✓ Enable to justify the way of combining learning styles so that learning can become more effective (Özdemir & Akalın, 2022).
- ✓ Without any effort, Kolb's learning theory can be used in all functional areas of the organization in order to train the employees in every subject area to solve the issues (Gencel, Erdogan, Kolb & Kolb, 2021).
- ✓ Kolb's learning theory can be used by an individual, by teams, or by whole organisations (Devi & Thendral, 2023).
- ✓ Kolb's learning theory can be used in a particular training, briefing sessions, or long-term training of study (Devi & Thendral, 2023; Fergusson, 2022; Aksan, 2021)

Therefore, the Kolb (1984)'s learning style model is considered to be most appropriate and relevant learning theory to undertake this study in determining leadership effectiveness.

Research Methods

This conceptual analysis via literature review examined relevant information regarding cultural intelligence, learning style and leadership effectiveness in a multi-ethnic society. The primary goal of this conceptual analysis through systemic literature review is to identify the existing research gaps with regards to a particular research area. The synthesis of the existing research available on public domains focused on examining the causal impact of CQ and learning style on leadership effectiveness outcomes were important to achieve the objective of this conceptual analysis. Therefore, a well-designed approach was adopted to analyses and determine the value of relevant research using a widely adopted selection process, which is illustrated below.

Search Strategy

Multiple databases were utilized to identify published, peer-reviewed articles containing relevant primary studies. Studies were sourced from the following databases: Emerald Insight, Science Direct/Elsevier, Business Source Premier/EBSCO, Google Scholar, and Sage Publications. The inclusion criteria and search terms were developed. Full article screening was subsequently completed, through which additional articles were identified for inclusion. Emphasis was placed on selecting studies that applied to cultural intelligence and learning style at the level of individual capability, while simultaneously capturing only those studies that were relevant to the concept of leadership effectiveness. Keywords for the search, therefore, included three concept domains such as "cultural intelligence," "learning style", and "leadership effectiveness".

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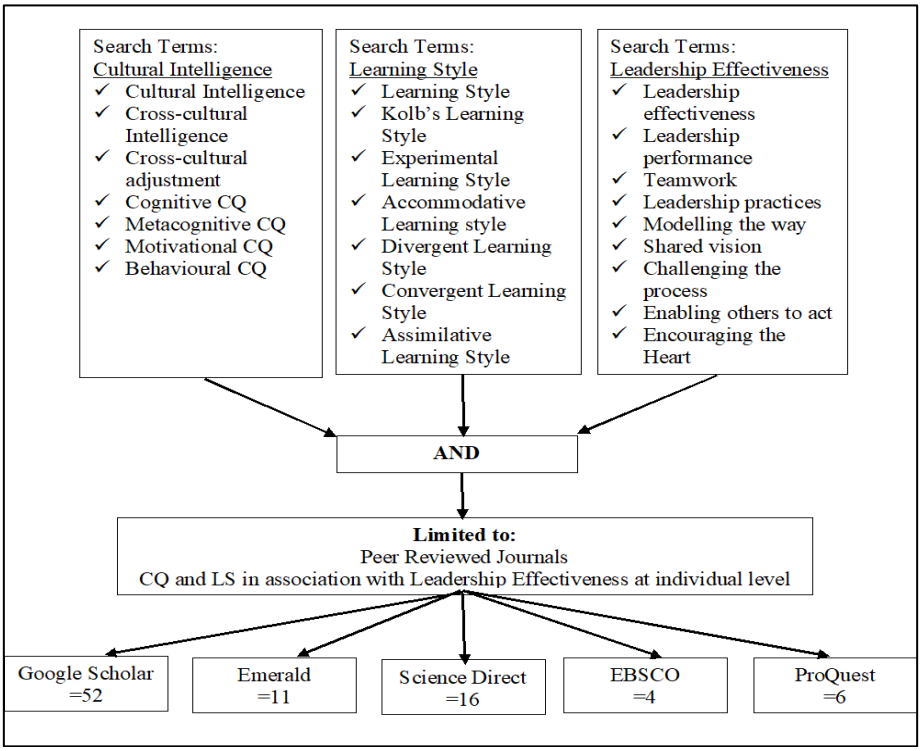

Figure 1. Search Strategy Framework

Within these three (3) categories, several related terms and synonyms were used with OR as the connector in order to avoid excluding studies which used different phrasing. The category CULTURAL INTELLIGENCE included: "cultural intelligence", "cross-cultural intelligence", "cross-cultural adjustment", "cognitive CQ", "metacognitive CQ", "motivational CQ", and "behavioural CQ". The category LEARNING STYLE included: "learning style", "Kolb's learning style", "experimental learning style", "accommodative learning style", "divergent learning style", "convergent learning style", and "assimilative learning style". With respect to the category "LEADERSHIP EFFECTIVENESS" included the words "leadership effectiveness", "leadership performance", "teamwork", "leadership practices", "modelling the way", "shared vision", "challenging the process", "enabling others to act", and "encouraging the heart".

During the search, the word AND was used a search connector to ensure at least one keyword from each category of "CULTURAL INTELLIGENCE"," LEARNING STYLE" and "LEADERSHIP EFFECTIVENESS" was included in the results. Separate searches on all five (5) databases using the keywords produced a total of eighty-nine (89) outcomes, as summarized in Figure 1.

The abstract was first reviewed and examined to check for its relevance and to determine if the studies met the inclusion criteria as discussed below. The full text was examined to determine the relevance of the article against the inclusion criteria. Furthermore, the reference sections of relevant articles thoroughly examined to include any additional relevant articles for analysis. The duplicated articles were removed during the screening process. Most of the articles found during the literature search were excluded based on the selection criteria.

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Research articles were screened for specific qualities identified in the selection criteria in order to determine the most relevant available evidence on the causal impact of cultural intelligence and learning style on leadership effectiveness outcomes. Only relevant peer-reviewed journal articles were included in the analysis. Most of the articles, particularly research articles that examined cultural intelligence and learning style at organisational capability level were excluded. Research articles that focused on or provide data on examining the impact of cultural intelligence and learning style and/or its elements on leadership effectiveness were included. The studies that assessed the predictors of cultural intelligence and learning style using self-report measures were included based on the inclusion criteria. The predictor of cultural intelligence includes cultural intelligence, cross-cultural intelligence, cross-cultural adjustment, cognitive, metacognitive, motivational and behavioural CQ. Studies that assessed learning style of leaders based on Kolb's accommodative, divergent, convergent and assimilative learning style by utilizing peer/supervisor assessment or self-reporting that met the inclusion criteria. Studies which examined leader's leadership effectiveness but were not associated with cultural intelligence (CQ) and learning style were excluded from the review. The leadership performance, teamwork, leadership practices, modelling the way, shared vision, challenging the process, enabling others to act, and encouraging the heart were included in the selection process. If any of these concepts were not identified in association with leadership effectiveness were excluded from the review.

According to Earley and Ang (2003), CQ research was driven by the reality of shrinking space, shrinking time, and borderless world causing a deeper integration of globalisation in the workplace, where the credibility of research seeking to address the impact of CQ on leadership effectiveness particularly in multi-ethnic society. Considering this, the diversity of research contributions and diversity of leadership experience were deemed to be vital to the context of this specific research. In order to ensure that all applicable leadership effectiveness experiences were assessed. Therefore, the journal location and quality were not included as a screening requirement. The article selection process was illustrated in Figure 2.

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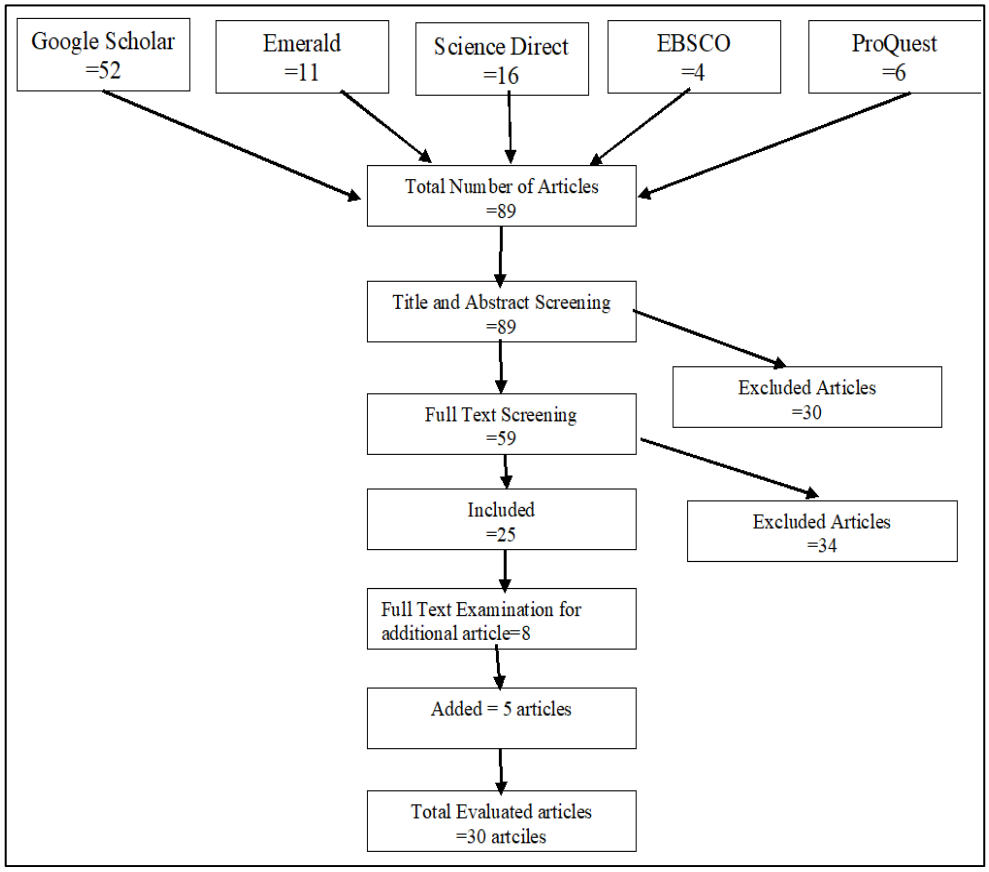

Figure 2. Article Selection Process

Findings and Analysis

Cultural intelligence (CQ) tends to portray a general perspective about various cultural norms, practices, and values that enables to increase leadership effectiveness (Fu & Charoensukmongkol, 2023; Ahmad & Saidalavi, 2019). Also, they argued that CQ is one of the prime factors that influence leadership effectiveness in multicultural setting where there exists a very diverse workforce (Khemakhem, 2023; Velarde et al., 2022; Licki& Van Der Walt, 2021; Ahmad & Saidalavi, 2019; Osman-Gani & Hassan, 2018). Furthermore, it was found that in situations which involved cultural diversity cross-border context, leaders with high level of CQ have an enormous influence on leadership effectiveness (Davidaviciene & Al Majzoub, 2022; Charoensukmongkol, 2021; Rockstuhl & Van Dyne, 2018). Furthermore, it was argued that global leaders with high level of CQ able to transform their experiences into positive learning outcomes that improve their overall leadership effectiveness (Cotter, 2021). More recent research suggested that CQ has significant effect on the inter-cultural capacity of leaders and by improving such intellectual behaviour of leader's causes to improve leadership effectiveness (Chen et al., 2023; Stoermer et al., 2021; Liao & Thomas, 2020). Several research have examined the relationship between the dimensions of cultural intelligence; meta-cognitive CQ, cognitive CQ, motivational CQ, and behavioural CQ towards transformational leadership and found meta-cognitive CQ was the most significant predictor of transformational leadership (Akpan & Inyang, 2022; Idrus, 2021; Afsar et al,

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2019; Göksoy, 2017; Ang et al, 2007). In the past, research has indicated that Metacognitive CQ was significantly associated with leadership effectiveness (Le, Jiang & Radford, 2021; Solomon & Steyn, 2017). Second dimension of CQ such as cognitive CQ has a significantly strong influence on leadership effectiveness (Mangla, 2021; Kim & Van Dyne, 2012). Also, past research has asserted that motivational CQ has a significantly positive influence on transformational leadership (Velarde et al., 2022; Ismail, Reza & Mahdi, 2012). Research done in the past indicated that motivational CQ was significantly associated with leadership effectiveness (Charoensukmongkol, 2021; Solomon & Steyn, 2017). A recent study also indicated that motivational CQ is positively associated with leadership effectiveness in terms of task performance (Song, Varma & Zhang Zhang, 2023; Pacheco & Stevens, 2018). In terms of behavioural CQ, research indicated that behavioural CQ has significant and positive influence on leadership effectiveness (Charoensukmongkol, 2021; Göksoy, 2017). Furthermore, past research found that behavioural CQ has mediated the preceding cultural interaction towards international leadership potentials (Velarde et al., 2022; Van Dyne et al, 2012). Since most of the recent research reported that leaders directly influence employee performance indicating leadership effectiveness, it shows that behavioural CQ of leaders has a positive and significance effect on employee performance (Yuan, Kim & Min, 2023; Göksoy, 2017; Ismail, Reza & Mahdi, 2012). Therefore, the following proposition is developed:

Proposition 1: CQ has a positive and significant effect on leadership effectiveness.

The relationship between learning style and leadership effectiveness is merely established in the past research. Also, leaders can become more effective by selecting a specific learning style to acquire and disseminate knowledge (Saputra & Hadi, 2023; Park & Kim, 2016). Once leaders identify their learning style, it will help them to understand the process making them more effective in learning and acquiring knowledge (Saputra & Hadi, 2023; Gemmell, 2017). Furthermore, this enables leaders to increase their own learning processes and skills, opening the opportunity to improved performance and personal development (Durnali, 2022; Heslin & Keating, 2017). In addition to this, learning style makes it easier for the leaders to know how to attain the skills or knowledge involved in their everyday responsibilities (Idkhan & Idris, 2021; Gemmell, 2017). As argued by Posner (2016), individuals who can learn from more than one category and thus have a greater repertoire of learning styles at their disposal are better able to learn about leading and becoming leaders. The reviewed research indicated that Kolb's learning styles such as concrete experience has significantly positive relationship with leadership effectiveness in terms of strategic decision making (Rossetti, 2023; Wong et al., 2022; Akyürek & Guney, 2018). They also found that learning styles such as abstract, active, and reflective observation have a positive and significant association with leadership effectiveness in terms of effective decision making (Fergusson, 2022; Akyürek & Guney, 2018). With reference to past literature, it is evident that each learning style poses challenges and enables opportunities for leaders to become more effective by adopting the most suitable learning style (Aksan, 2021; Basit et al, 2020). For example, past research indicated that the divergent learning style has the strength and liability of lie in leaders desire to search unceasingly for new possibilities and solutions (Maya, Luesia & Pérez-Padilla, 2021; Turesky & Gallagher, 2011). On the negative side the divergent learning style may diverge leaders from the problem or situation at hand and go off on a tangent, straying significantly from the task (Cohen, 2023; Alvesson, 2019) making

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leaders become less relevant and ineffective. In terms of convergent learners, they are very technical rather than interpersonal (Idkhan & Idris, 2021; Ata & Cevik, 2019). However, leaders with convergent learning style tend to make decisions without complete information causing those leaders to become less effective (Maker, 2022; Gemmell, 2017). However, the leaders with the learning style of converges tend to be more effective when they work in groups (Malatji, Ramollo & Malatji, 2023; Labib et al, 2017). In terms of assimilators, those leaders with assimilator learning style tend to gather information and data to make decisions, while they tend to think a lot and be concerned about the people (Nitriani, Darsikin & Saehana, 2022; Turesky & Gallagher, 2011). Assimilators are less effective in decision making as assimilators normally will make decisions when they only obtain the complete set of information (Kamran, Naeim, Mohammadi & Masoumi, 2022; McCarthy, 2016). Leaders with accommodative learning style tend to respond quickly to the needs, especially when others are involved (Saputra & Hadi, 2023; Jena, 2016). Accommodators are highly effective in their decision making and focus on whole problem results improvement in leadership effectiveness (Saputra & Hadi, 2023; Avsec, & Szewczyk-Zakrzewska, 2017). Therefore, the following proposition is developed:

Proposition 2: Learning Styles have positive and significant effect on leadership effectiveness.

Conclusions

Based on the review of the related theories, concepts and past literature, it can be concluded that cultural intelligence (CQ) and Learning styles are two crucial constructs that can influence leadership effectiveness. Cultural intelligence (CQ) reflected by the four aspects such as cognitive CQ, meta-cognitive CQ, motivational CQ and behavioural CQ has a positive and significant impact on leadership effectiveness. Although very few studies have focused on examining the relationship between learning style and leadership effectiveness, it was argued in the past that identification of appropriate learning style of leaders is important to develop effective leadership competencies. Also, the overall effect of learning style dimensions on leadership effectiveness is very important. Therefore, it is very important to empirically examine effects of CQ and LS on Leadership Effectives in banking sector, particularly in Malaysia to establish the link between CQ and LE through LS and thereby identify the appropriate human resource development interventions to develop leadership effectiveness through five exemplary practices of leadership proposed by Kuozes and Posner (1995). This study will enable managers in the banking sector to develop and design their human capital programs as well as in training programs to enhance the CQ and leaning style adoption among the managers, particularly pharmaceutical industry Leaders.

Implications for Research and Practice

This study will increase the level of understanding and knowledge about multiple cultures and will enable us to focus on ways to facilitate successful inter-cultural interaction. As a result of increasing knowledge, it may increase leadership effectiveness. Also, this study will contribute to developing new knowledge in the theoretical domains of the theories of multiple intelligence and learning styles. The findings will also enable

managers in making new organisational and human resource development policy decisions on improving and enhancing leadership effectiveness by improving cultural intelligence as well as by facilitating and guiding managers to adopt most appropriate learning style.

Also, this study will emphasis establishing the LS and CQ as two key determinants of leadership effectiveness. This means the study will contribute to leadership theory with new findings. Since many studies have been undertaken to study various aspects of the Theory of multiple intelligence, the present study has chosen CQ as a key intelligence construct that is relevant to study leadership effectiveness. Since leaders working in commercial sectors in Malaysia are constantly engaging with people from various cultural backgrounds (Malay, Chinese, Indians and other ethnic groups), commercial enterprise leaders need to enhance their CQ to make effective and efficient decisions to increase productivity. MNCs operating in Malaysian enterprises contribute significantly and they have grown bigger during past years. To ensure sustainability of the organisations, leaders must understand the effect of CQ on the cultural adjustment of foreign workers/expatriates working in multinational organisations in Malaysia.

Based on motivation theories, motivational CQ affects leaders or employee performance because the individual's desire to test other cultures and interact with people of those cultures help people in doing their jobs better, through flexibility in verbal and non-verbal communication skills in fulfilling job expectations. Since an important part of CQ is skills and capabilities that are related to employee performance, leaders inevitably must develop or improve this intelligence among their employees. This study will contribute by identifying which dimensions of CQ are crucial for pharmaceutical leaders to enhance their leadership effectiveness.

The current study will enable employees to identify their strengths and weaknesses in relevant facets of CQ. This can serve as a starting point for putting further efforts in improving their performance by eliminating their weaknesses. Cross-cultural training for employees, familiarising them with values, norms, behaviours, differences of people from different cultures, and using the internet are among the ways of improving CQ in employees. Employees can overcome their weaknesses through such educational programs. Therefore, as most CQ skills and capabilities can be learned, leaders can provide special importance to improving such intelligence among themselves and move towards improving cognitive and behavioural skills of their employees by using appropriate training.

These concepts are beneficial to not only human resource practitioners but also researchers who are interested in studying the people who work overseas. To compete successfully in international assignments, they must select and develop employees who can function effectively in a global context (Charoensukmongkol, 2021; Hassan and Diallo, 2013). Human Resource departments have paid high attention to expatriate management and development issues because these play important roles in organisations and have been highly impacted due to the extent of globalisation trend (Hassan, 2022). To succeed in expatriates' performance effectiveness in overseas assignment, selection and training process are important functions (Zhong, Zhu & Zhang, 2021). For achieving this performance effectiveness, leaders and managers should emphasize on training and

development for the success of expatriates working on international assignments in Malaysia or in other multicultural contexts. This study will help the leaders to motivate and develop the young and dynamic employees to become more effective leaders in today's global business environment by focusing on the key areas of LS and CQ in order to continuously improve their leadership competencies.

Limitations

Despite several measures are taken to ensure the limitation of the study is minimised, several limitations are associated with the study. (1) It is limited to the use of six (6) databases such as Google-scholars, Emerald insight, Science Direct, EBSCO and ProQuest. While the use of the Google Scholar and Science Direct provides a strong and reliable basis for citation analysis, the combination of other databases such as Web of Science or ERA as well as Scopus would have provided a more comprehensive set. (2) Keywords like "cultural intelligence" exist across multiple fields and this study is limited to business, management and cross-cultural studies literature. Similarly, the keywords like "learning styles" are diverse and multiple styles of learning existed although this study limited to Kolb's learning styles or Kolb's experimental learning style. This causes to exclude several studies that have established the link between learning styles and organizational outcomes. (3) Due to the limited studies available in terms of learning style in the context of business and management. Most of the studies reviewed were based on educational context rather than corporate setting. (4) The filtration of research articles of journals or book chapters were less strictly oriented on journal ranking lists as implemented in other research papers. (5) Most of the studies used in this review are based on other countries such as India, Europe, and U.S.A rather than Malaysia. This show lack of literature available on Malaysian context in terms of LS and CQ, particularly in association with leadership effectiveness.

Authors' Contributions

Zubair Hassan has done a thorough review of the recent and other publications that are relevant to this topic. He came out with the idea of the title and development of the conceptual framework. He has identified that conceptual gaps, and written the literature review and the methodology. He also has written the conceptual analysis.

Zabeda Bt Abdul Hamid have assisted and guided the literature review. She has provided useful inputs on where to find the relevant articles and publications that are available in the field of the study. Also, she helped in reading and correcting the reviews. Furthermore, she spends a great deal of time in editing and proofreading the manuscript. She has done corrections of the paper twice. Mostly she has done a faire review of the conclusion and implication aspect of the paper.

References

Abbas, A., Ekowati, D., & Suhariadi, F. (2021). Individual psychological distance: A leadership task to assess and cope with invisible change. *Journal of Management Development, 40*(3), 168-189.

AbuKhousa, E., El-Tahawy, M. S., & Atif, Y. (2023). Envisioning architecture of metaverse intensive learning experience (MiLEx): Career readiness in the 21st century and collective intelligence development scenario. *Future Internet, 15*(2), 53-73.

Afsar, B., Shahjehan, A., Shah, S.I. & Wajid, A (2019). The mediating role of transformational leadership in the relationship between cultural intelligence and employee voice behavior: A case of hotel employees. *International Journal of Intercultural Relations*, 69, 66-75.

Ahmad, S., & Saidalavi, K. (2019). Cultural intelligence and leadership effectiveness in global workplaces. *International Journal on Leadership,* 7(1), 1-7.

Ajanaku, O. J., & Lubbe, W. (2021). Applying transformational leadership in nursing through the lens of Kouzes and Posner leadership practices. *Gender and Behaviour, 19*(2), 17788-17794.

Akpan, A. P., & Inyang, A. B. (2022). Academic Staff Cultural Intelligence and Job Performance in Nigerian Universities. *International Journal of Management Science and Business Administration, 8*(3), 7-14.

Aksan, J. A. (2021). Effect of modular distance learning approach to academic performance in mathematics of students in Mindanao State University-Sulu Senior High School amidst COVID-19 pandemic. *Open Access Indonesia Journal of Social Sciences, 4*(4), 445-467.

Akyürek, S. & Guney, S. (2018). Effects of learning styles and locus of control on the Decision-Making Styles of Leader Managers. *Eurasia Journal of Mathematics, Science and Technology Education, 14*(6), 2317-2328.

Aldhaheri, A. (2017). Cultural intelligence and leadership style in the education sector. *International Journal of Educational Management*, 31(6), 718-735.

Ali, B. J., & Anwar, G. (2021a). Strategic leadership effectiveness and its influence on organizational effectiveness. *International Journal of Electrical, Electronics and Computers, 6*(2), 11-24.

Ali, B. J., & Anwar, G. (2021b). Business strategy: The influence of Strategic Competitiveness on competitive advantage. International Journal of Electrical, Electronics and Computers, 6(2), 1-10.

Alonso-Martín, P., Cruz-Díaz, R., Granado-Alcón, C., Lago-Urbano, R., & Martínez-García, C. (2021). Variability of higher education students' learning styles depending on gender, course, degree and institutional context. *Sustainability, 13*(4), 1659-1677.

Alvesson, M. (2019). Leadership: Convergence and divergence in leadership relations. *Journal of Management Inquiry*, 28(3), 319-334.

Ang, S., Van Dyne, L., Koh, C., Ng, K. Y., Templer, K. J., Tay, C., & Chandrasekar, N. A. (2007). Cultural intelligence: Its measurement and effects on cultural judgment and decision making, cultural adaptation and task performance. *Management and organization review, 3(*3), 335-371.

Ashley, M. (2020). *Cultural Intelligence and Its Relationship to Leadership Effectiveness in Independent Private Schools*. (Doctoral dissertation, Trevecca Nazarene University), 1-131.

Ata, R., & Cevik, M. (2019). Exploring relationships between Kolb's learning styles and mobile learning readiness of pre-service teachers: A mixed study. *Education and Information Technologies, 24*(2), 1351-1377.

Avsec, S., & Szewczyk-Zakrzewska, A. (2017). Predicting academic success and technological literacy in secondary education: a learning styles perspective. *International Journal of Technology and Design Education*, *27*(2), 233-250.

Basit, A, Sethumadevan, S and Hassan, Z (2020). Effect of cultural intelligence and learning style on Leadership Effectiveness: Conceptual Analysis. *The International Journal of Business and Management*, *8*(6), 179-186.

Barry, M., & Egan, A. (2018). An adult learner's learning style should inform but not limit educational choices. *International Review of Education, 64*(1), 31-42.

Bass, B. M., & Stogdill, R. M. (1990). *Bass & stodgill's handbook of leadership: Theory, research & managerial applications*. Free Press.

Blanchard, K. (2018). *Leading at a higher level: Blanchard on leadership and creating high performing organizations*. FT Press.

Burnes, B., Hughes, M., & By, R. T. (2018). Reimagining organisational change leadership. *Leadership*, *14*(2), 141-158.

Charoensukmongkol, P., & Phungsoonthorn, T. (2022). The effect of cultural intelligence of top management on pro-diversity work climate and work attitudes of Myanmar migrant workers in Thailand. *Equality, Diversity and Inclusion, 41*(5), 760-777.

Charoensukmongkol, P. (2021). How Chinese expatriates' cultural intelligence promotes supervisor-subordinate Guanxi with Thai employees: the mediating effect of expatriates' benevolence. *International Journal of Cross-Cultural Management, 21*(1), 9-30.

Chen, Y., Yang, Z., Liu, B., Wang, D., Xiao, Y., & Wang, A. (2023). How cultural intelligence affects expatriate effectiveness in international construction projects. *Engineering, Construction and Architectural Management, ahead-of-print* (ahead-of-print).

Chiu, M. C., Hwang, G. J., & Hsia, L. H. (2023). Promoting students' artwork appreciation: An experiential learning-based virtual reality approach. *British Journal of Educational Technology, 54*(2), 603-621.

Cohen, J. A. (2023). The purposeful use of Kolb's learning styles in online learning design. *Development and Learning in Organizations: An International Journal, 37*(4), 1-4.

Davidaviciene, V., & Al Majzoub, K. (2022). The effect of cultural intelligence, conflict, and transformational leadership on decision-making processes in virtual teams. *Social Sciences, 11*(2), 64-80.

Devi, M. K., & Thendral, M. S. (2023). Using Kolb's Experiential Learning Theory to Improve Student Learning in Theory Course. *Journal of Engineering Education Transformations, 37*(1), 70-81.

Dibble, R., Henderson, L. S., & Burns, Z. C. (2019). The impact of students' cultural intelligence on their psychological safety in global virtual project teams. *Journal of Teaching in International Business, 30*(1), 33-56.

Durnali, M. (2022). 'Destroying barriers to critical thinking'to surge the effect of self-leadership skills on electronic learning styles. *Thinking Skills and Creativity, 46*, 101130.

Earley, P. C., & Ang, S. (2003). *Cultural intelligence: individual interactions across cultures*. Stanford University Press.

Fergusson, L. (2022). Learning by… Knowledge and skills acquisition through work-based learning and research. *Journal of Work-Applied Management, 14*(2), 184-199

Felder, R. M., & Silverman, L. K. (1988). Learning and teaching styles in engineering education. *Engineering Education, 78*(7), 674-681.

Fu, L., & Charoensukmongkol, P. (2023). Effect of cultural intelligence on burnout of Chinese expatriates in Thailand: The mediating role of host country national coworker support. *Current Psychology, 42*(5), 4041-4052.

Furnham, A. (2017). Personality differences in managers who have, and have not, worked abroad. *European Management Journal, 35*(1), 39-45.

Gayef, A., Çaylan, A., & Temiz, S. A. (2023). Learning styles of medical students and related factors. *BMC Medical Education, 23*(1), 282-292.

Gemmell, R. M. (2017). Learning styles of entrepreneurs in knowledge-intensive industries. *International Journal of Entrepreneurial Behavior & Research, 23*(3), 446-464.

Gencel, I. E., Erdogan, M., Kolb, A. Y., & Kolb, D. A. (2021). Rubric for experiential training. *International Journal of Progressive Education, 17*(4), 188-211.

Gill, M. S. (2021). Challenges and Changes of Pharmacy Practice During the COVID-19 Crisis in Malaysia: Instability as an Opportunity. *The Malaysian Journal of Medical Sciences: MJMS, 28(*2), 171-176.

Göksoy, S. (2017). The relationship between principals' cultural intelligence levels and their cultural leadership behaviors. *Educational Research and Reviews*, *12*(20), 988-995.

Haider, S., Nisar, Q. A., Baig, F., & Azeem, M. (2018). Dark side of leadership: employees' job stress & deviant behaviors in pharmaceutical industry. *International Journal of Pharmaceutical Research & Allied Sciences*, *7*(2), 125-138.

Hamid, F. A., Widodo, S. E., & Buchdadi, A. D. (2022). The influence of transformational leadership, emotional intelligence, organizational climate, and teamwork, towards organizational citizenship behavior of civil servants. *International Journal for Applied Information Management*, *2*(3), 26-39.

Hasnine, M. N., Ahmed, M. M. H., & Ueda, H. (2021, July). A Model for Fostering Learning Interaction in Hybrid Classroom based on Constructivism Theory. In *2021 10th International Congress on Advanced Applied Informatics (IIAI-AAI)* (pp. 01-04). IEEE.

Hassan, Z., Osman-Gani & Hamid, Zbt. A (2022). Influence of Learning Style and Knowledge Sharing Behaviour on Leadership Effectiveness -Conceptual Analysis. *Pacific Business Review (International), 15*(1), 100-114.

Hassan, Z., Basit, A., & Sethumadavan, S. (2020). Role of sales representative's cultural intelligence in enhancing Customer Satisfaction among the tenants and property buyers in Malaysia. *International Journal of Business Marketing and Management (IJBMM), 5*(7), 37-56.

Hassan, Z., & Diallo, M. M. (2013). Cross-cultural adjustments and expatriate's job performance: a study on Malaysia. *International Journal of Accounting and Business Management, 1*(1), 8-23.

Hassan, Z (2022). Employee retention through effective human resource management practices in Maldives: mediation effects of compensation and rewards system. *Journal of Entrepreneurship, Management and Innovation*, *18*(2), 137-173.

Hatane, S. E., Diandra, J. C., Tarigan, J., & Jie, F. (2021). Voluntary intellectual capital disclosure and earnings forecast in Indonesia–Malaysia–Thailand growth triangle's pharmaceuticals sector. *International Journal of Emerging Markets,18*(1),1-18.

Harrison, D. T. (2016). *An examination of the relationship between experiential learning styles and the development of global competence in leaders* (1-179). Indiana Wesleyan University.

Heslin, P. A., & Keating, L. A. (2017). In learning mode? the role of mindsets in derailing and enabling experiential leadership development. *The Leadership Quarterly*, 28(3), 367-384.

Hidayati, T., & Zainurossalamia, S. (2020). Cultural intelligence as a pre-requisite for voice behavior of pharmaceutical sector employees in Indonesia: mediating role of servant and ethical leadership styles. *Systematic Reviews in Pharmacy*, *11*(5), 216-225.

Hohenberg, S., & Homburg, C. (2016). Motivating sales reps for innovation selling in different cultures. *Journal of Marketing*, *80*(2), 101-120.

Husmann, P. R., & O'Loughlin, V. D. (2019). Another nail in the coffin for learning styles? Disparities among undergraduate anatomy students' study strategies, class performance, and reported VARK learning styles. *Anatomical Sciences Education*, *12*(1), 6-19.

Idkhan, A. M., & Idris, M. M. (2021). Dimensions of students learning styles at the university with the kolb learning model. *International Journal of Environment, Engineering and Education*, *3*(2), 75-82.

Idrus, F. (2021). Exploring Cultural Intelligence Skills among International Postgraduate Students at a Higher Education Institution. *International Journal of Higher Education*, *10*(4), 220-234.

Iskhakova, M., & Ott, D. L. (2020). Working in culturally diverse teams. *Journal of International Education in Business*,*13(*1) 37-54.

Islam, R., Osman, N., Othman, M. F., & Raihan, M. A. (2019). Impact of global leadership behaviors on performance of multinational companies. *Humanities & Social Sciences Reviews*, *7*(3), 661-670.

Ismail, A. M., Reza, R., & Mahdi, S. (2012). Analysis the relationship between cultural intelligence and transformational leadership. *International Journal of Business and Social Science*, *3*(14), 252-261.

Jena, R. K. (2016). Investigating the interrelation between attitudes, learning readiness, and learning styles under virtual learning environment: a study among Indian students. *Behaviour & Information Technology*, *35*(11), 946-957.

Jiang, Z., Le, H., & Gollan, P. J. (2018). Cultural intelligence and voice behavior among migrant workers: the mediating role of leader–member exchange. *The International Journal of Human Resource Management*, *29*(5), 1082-1112.

Joy, S., & Kolb, D. A. (2009). Are there cultural differences in learning style? *International Journal of Intercultural Relations, 33*(1), 69-85.

Kamran, A., Naeim, M., Mohammadi, M., & Masoumi, N. (2022). Prediction of academic performance based on learning style and critical thinking among medical students. *Journal of Pedagogical Research, 6*(1), 57-66.

Keefe, J.W. (1982). Assessing students learning styles. In *J.W. Keefe (Ed.), Student Learning Style and Brain Behaviour* (pp. 1-18), Reston, VA: National Association of Secondary School Principals.

Khan, M. A., & Panarina, E. (2017). The role of national cultures in shaping the corporate management cultures: A four countries theoretical analysis. *Journal of Eastern European and Central Asian Research*, 4(1), 13-25.

Khemakhem, A. (2023). Culturally Intelligent Educational Leaders: Effectiveness of Preparation Programs in Developing Educational Leaders Cultural Intelligence. *International Journal of Educational Reform, 0*(0), pp-pp.

Kim, Y. J., & Van Dyne, L. (2012). Cultural intelligence and international leadership potential: the importance of contact for members of the majority. *Applied psychology*, *61*(2), 272-294.

Kolb, D.A. (1984). *Experiential Learning: Experience as the Source of Learning and Development*. Prentice Hall.

Kolb, D. A. (1976). Management and the learning process. *California Management Review*, *18*(3), 21-31.

Kolb, A. Y., & Kolb, D. A. (2005). Learning styles and learning spaces: Enhancing experiential learning in higher education. *Academy of Management Learning & Education*, *4*(2), 193-212.

Koo, H., & Park, C. (2018). Foundation of leadership in Asia: leader characteristics and leadership styles review and research agenda. *Asia Pacific Journal of Management*, *35*(3), 697-718.

Kouzes, J. M., & Posner, B. Z. (2021). *Everyday people, extraordinary leadership: How to make a difference regardless of your title, role, or authority*. John Wiley & Sons.

Kouzes, J. M., & Posner, B. Z. (2018). *The student leadership challenge: Five practices for becoming an exemplary leader*. John Wiley & Sons.

Kouzes, J. M., & Posner, B. Z. (1995). *The leadership challenge: How to keep getting extraordinary things done in organisations*. San Francisco.

Kua, K. P., & Lee, S. W. H. (2021). The coping strategies of community pharmacists and pharmaceutical services provided during COVID-19 in Malaysia. *International journal of clinical practice*, *75(*12), e14992.

Kurpis, L. H., & Hunter, J. (2017). Developing students' cultural intelligence through an experiential learning activity: A cross-cultural consumer behavior interview. *Journal of Marketing Education*, *39*(1), 30-46.

Kwiotkowska, A., Wolniak, R., Gajdzik, B., & Gębczyńska, M. (2022). Configurational paths of leadership competency shortages and 4.0 leadership effectiveness: an fs/QCA study. *Sustainability*, *14*(5), 2795.

Labib, A. E., Canós, J. H., & Penadés, M. C. (2017). On the way to learning style models integration: a Learner's Characteristics Ontology. *Computers in Human Behavior*, *73*, 433-445.

Le, H., Jiang, Z., & Radford, K. (2021). Leader-member exchange and subjective well-being: The moderating role of metacognitive cultural intelligence. *Personnel Review*, *50*(3), 954-970.

Li, M., Mobley, W. H., & Kelly, A. (2013). When do global leaders learn best to develop cultural intelligence? An investigation of the moderating role of experiential learning style. *Academy of Management Learning & Education*, *12*(1), 32-50.

Liao, Y., & Thomas, D. C. (2020). Individual and interpersonal outcomes of cultural intelligence. In *Cultural Intelligence in the World of Work* (pp. 95-134). Springer, Cham.

Licki, M. M. P., & Van Der Walt, F. (2021). The influence of perceived cultural intelligence of school principals on teachers' job satisfaction and trust. *Management Dynamics: Journal of the Southern African Institute for Management Scientists*, *30*(2), 5-20.

Lopes, I., & Boyadjian, J. C. (2021). Impact of national culture in projects involving organizational culture change: Renault-Nissan Alliance case-study. *Quaestum*, *2*, 1-17.

Louw, L., Muriithi, S. M., & Radloff, S. (2017). The relationship between transformational leadership and leadership effectiveness in Kenyan indigenous banks. *SA Journal of Human Resource Management*, *15*(0), a935, 1-11.

Lor, W & Hassan, Z. (2017). The influence of leadership on employee performance among jewelry artisans in Malaysia. *International Journal of Accounting and Business Management*, *5*(1), 14-33.

Malatji, K. S., Ramollo, J. K., & Malatji, M. J. (2023). The use of Kolb's Theory to Conduct Effective Teaching in Mathematics: A Case Study of Learner Articulation Gap in a Grade 3 Class. *Journal of Educational Studies*, *22*(1), 26-45.

Malek, M. A., & Budhwar, P. (2013). Cultural intelligence as a predictor of expatriate adjustment and performance in Malaysia. *Journal of World Business, 48(*2), 222-231.

Mangla, N. (2021). Working in a pandemic and post-pandemic period–Cultural intelligence is the key. *International Journal of Cross-Cultural Management, 21*(1), 53-69.

Maya, J., Luesia, J. F., & Pérez-Padilla, J. (2021). The Relationship between Learning Styles and Academic Performance: Consistency among Multiple Assessment Methods in Psychology and Education Students. *Sustainability, 13(*6), 1-18.

Mayombe, C. (2023). Promoting youths' skills acquisition through experiential learning theory in vocational education and training in South Africa. *Higher Education, Skills and Work-Based Learning, ahead-of*-print (ahead-of-print), 1-16.

Maker, C.J. (2022). From leading to guiding, facilitating, and Inspiring: a needed shift for the 21st century. *Education Sciences, 12*(1), 18- 33.

McCarthy, M. (2016). Experiential learning theory: From theory to practice. *Journal of Business & Economics Research (JBER), 14*(3), 91-100.

Mui, H. K. Y., Basit, A., & Hassan, Z. (2018). The Impact of Strategic Leadership on Organizational Performance of Small Medium Enterprises (SME) in Malaysia. *Journal of Leadership and Management, 13*, 154-166.

Müller, E., Pintor, S., & Wegge, J. (2018). Shared leadership effectiveness: perceived task complexity as moderator. *Team Performance Management: An International Journal, 24*(5/6), 298-315.

Nam, K. A., & Park, S. (2019). Factors influencing job performance: organizational learning culture, cultural intelligence, and transformational leadership. *Performance Improvement Quarterly, 32*(2), 137-158.

Ng, K. Y., & Earley, P. C. (2006). Culture+ intelligence: old constructs, new frontiers. *Group & Organization Management, 31*(1), 4-19.

Nitriani, N., Darsikin, D., & Saehana, S. (2022). Kolb's learning style analysis in solving HOTS questions for prospective physics teacher students. *Momentum: Physics Education Journal, 6*(1), 59-72.

Nozaleda, B. M. (2021). Linking College Learners' Competence in Information and Communication Technology and Learning Styles during the COVID-19 Pandemic. *Turkish Journal of Computer and Mathematics Education (TURCOMAT), 12*(11), 3256-3262.

Osman-Gani, A. M., & Hassan, Z. (2018). Impacts of spiritual and cultural intelligence on leadership effectiveness: a conceptual analysis. *Journal of Islamic Management Studies, 1*(2), 12-23.

Osman-Gani, A.M., Anwar, A. & Hamid, Z.A. (2017). Impacts of emotional and spiritual intelligence on leadership effectiveness mediated by personal values: a conceptual framework. *Journal of Islamic Management Studies, 1*(1), 43-53.

Osman-Gani, A. M., & Rockstuhl, T. (2009). Cross-cultural training, expatriate self-efficacy, and adjustments to overseas assignments: An empirical investigation of managers in Asia. *International Journal of Intercultural Relations, 33*(4), 277-290.

Owens, B. P., & Hekman, D. R. (2016). How does leader humility influence team performance? Exploring the mechanisms of contagion and collective promotion focus. *Academy of Management Journal*, *59*(3), 1088-1111.

Özdemir, E. E., & Akalın, A. (2022). The Relationship between Students' Mimetic Approaches and Learning Styles in Architectural Design Education. *Periodica Polytechnica Architecture, 53*(2), 113-126.

Özdemir, O., & Hastürk, G. (2021). Examining the relationship between prospective preschool teachers' self-efficacy beliefs in science education and learning styles. *Science Education International, 32*(4), 292-301.

Pacheco, D., & Stevens, S. (2018). The role of culturally intelligent team leaders on task performance. In *Proceedings of 16th European Conference on Computer-Supported Cooperative Work-Panels, Posters and Demos*. European Society for Socially Embedded Technologies (EUSSET).

Paiuc, D. (2021). Cultural intelligence as a core competence of inclusive leadership. *Management Dynamics in the Knowledge Economy, 9*(3), 363-378.

Park, S., & Kim, E. J. (2018). Fostering organizational learning through leadership and knowledge sharing. *Journal of Knowledge Management, 22*(6), 1408-1423.

Piercy, N. F., Low, G. S., & Cravens, D. W. (2011). Country differences concerning sales organization and salesperson antecedents of sales unit effectiveness. *Journal of world business, 46*(1), 104-115.

Pidduck, R. J., Shaffer, M. A., Zhang, Y., Cheung, S. S., & Yunlu, D. G. (2022). Cultural intelligence: an identity lens on the influence of cross-cultural experience. *Journal of International Management, 28*(3), 100928.

Posner, B. Z. (2016). Investigating the reliability and validity of the leadership practices inventory. *Administrative Sciences, 6*(4), 17.

Presbitero, A. (2020). Foreign language skill, anxiety, cultural intelligence and individual task performance in global virtual teams: A cognitive perspective. *Journal of International Management, 26*(2), 100729.

Presbitero, A. (2016). Cultural intelligence (CQ) in virtual, cross-cultural interactions: generalizability of measure and links to personality dimensions and task performance. *International Journal of Intercultural Relations*, *50* (2016), 29-38.

Rahman, Z. S. A., Kabir, S. M. H., Haque, A., & Rahamad, M. S. B. (2022). Influence of Cultural Intelligence on Socio-cultural Adaptation for Expatriate Leaders in Malaysia. *Asian Journal of Economics, Business and Accounting, 22*(21), 98-111.

Ramalu, S. S., & Subramaniam, C. (2019). Cultural intelligence and work engagement of expatriate academics: the role of psychological needs satisfaction. *International Journal of Cross-Cultural Management*, *19*(1), 7-26.

Reyes, A. Q. (2021). *The Relationship between Cultural Intelligence, Knowledge Transfer, and Experiential Learning Styles* (Doctoral dissertation, Capella University), 1-14.

Richard-Eaglin, A. (2021). The significance of cultural intelligence in nurse leadership. Nurse leader, 19(1), 90-94.

Rockstuhl, T., & Van Dyne, L. (2018). A bi-factor theory of the four-factor model of cultural intelligence: meta-analysis and theoretical extensions. *Organizational Behavior and Human Decision Processes*, *148*, 124-144.

Rossetti, G. (2023). Applying Kolb's experiential learning theory to an event management course: practical guidelines for educators. *Event Management, Online First*.

Saputra, M. A., & Hadi, C. (2023). Investor's Learning Style and Knowledge Acquisition Dimension: The Role of ICT in Maximising Knowledge Acquisition. *Journal of Accounting and Investment, 24*(1), 25-49.

Shao, L. H., Bouzdine-Chameeva, T., & Lunardo, R. (2020). The interacting effect of business and cultural distances on relationship management and export performance: the case of wine export between France and China. *Journal of Business & Industrial Marketing*, *35*(11), 1659-1672.

Shore, A., & Dinning, T. (2023). Developing student's skills and work readiness: an experiential learning framework. *Journal of Work-Applied Management, ahead-of-print* (ahead-of-print). pp-pp.

Sims, C., Carter, A., & Peralta, A. M.D. (2021). Do servant, transformational, transactional, and passive avoidant leadership styles influence mentoring competencies for faculty? A study of a gender equity leadership development program. *Human Resource Development Quarterly, 32*(1), 55-75.

Singh, M. (2021). Study on impact of self-efficacy on leadership effectiveness in IT companies. *International Journal of Science and Society, 3*(1), 89-98.

Solomon, A., & Steyn, R. (2017). Leadership style and leadership effectiveness: does cultural intelligence moderate the relationship? *Acta Commercii*, *17*(1), 1-13.

Solomon, A., & Steyn, R. (2017a). Leadership styles: the role of cultural intelligence. *SA Journal of Industrial Psychology*, *43*(1), 1-12.

Song, H., Varma, A., & Zhang Zhang, Y. (2023). Motivational cultural intelligence and expatriate talent adjustment: an exploratory study of the moderation effects of cultural distance. *The International Journal of Human Resource Management, 34*(2), 344-368.

Song, C. E., & Park, H. (2021). Active learning in e-learning programs for evidence-based nursing in academic settings: A scoping review. *The Journal of Continuing Education in Nursing, 52*(9), 407-412.

Stoermer, S., Davies, S., & Froese, F. J. (2021). The influence of expatriate cultural intelligence on organizational embeddedness and knowledge sharing: The moderating effects of host country context. *Journal of International Business Studies, 52*, 432-453.

Sultana, U. S., Tarofder, A. K., Darun, M. R., Haque, A., & Sharief, S. R. (2020). Authentic leadership effect on pharmacists job stress and satisfaction during COVID-19 pandemic: Malaysian perspective. *Talent Development & Excellence*, *12* (3s),1824-1841.

Sternberg, R. J. (2018). Theories of intelligence. In *S. I. Pfeiffer, E. Shaunessy-Dedrick, & M. Foley-Nicpon (Eds.), APA handbooks in Psychology. APA handbook of giftedness and talent (*p. 145–161). American Psychological Association.

Taneja, M., Kiran, R., & Bose, S. C. (2023). Understanding the relevance of experiential learning for entrepreneurial self-efficacy: A gender-wise perspective. *The International Journal of Management Education, 21*(1), 100760.

Thomas, D. C., Elron, E., Stahl, G., Ekelund, B. Z., Ravlin, E. C., Cerdin, J. L., ... & Maznevski, M. (2008). Cultural intelligence: Domain and assessment. *International Journal of Cross-Cultural Managemen*t, *8*(2), 123-143.

Turesky, E.F & Gallagher, D (2011). Know thyself: coaching for leadership using Kolb's experiential learning theory. *The Coaching Psychologist*, *7*(1), 5-14.

Ugbam, O. C., & Okoro, E. A. (2017). A strategic study of the Nigerian pharmaceutical sector: organizational leadership, market-share, and competitive performance. *International Journal of Business, Humanities and Technology*, *7*(1), 1-10.

Velarde, J. M., Ghani, M. F., Adams, D., & Cheah, J. H. (2022). Towards a healthy school climate: The mediating effect of transformational leadership on cultural intelligence and organisational health. *Educational Management Administration & Leadership, 50*(1), 163-184.

Van Dyne, L., Ang, S., Ng, K. Y., Rockstuhl, T., Tan, M. L., & Koh, C. (2012). Sub-dimensions of the four-factor model of cultural intelligence: expanding the conceptualization and measurement of cultural intelligence. *Social and Personality Psychology Compass, 6*(4), 295-313.

Warrick, D. D. (2017). What leaders need to know about organizational culture? *Business Horizons, 60*(3), 395-404.

Weber, T. J., Sadri, G., & Gentry, W. A. (2018). Examining diversity beliefs and leader performance across cultures. *Cross Cultural & Strategic Management, 5*(3). 382-400.

Wijnen-Meijer, M., Brandhuber, T., Schneider, A., & Berberat, P. O. (2022). Implementing Kolb s experiential learning cycle by linking real experience, case-based discussion and simulation. *Journal of medical education and curricular development, 9*, 1-5.

Wong, R. (2022). Basis psychological needs of students in blended learning. *Interactive Learning Environments, 30*(6), 984-998.

Wong, J. Y. H., Ko, J., Nam, S., Kwok, T., Lam, S., Cheuk, J., ... & Wai, A. K. C. (2022). Virtual ER, a serious game for interprofessional education to enhance teamwork in medical and nursing undergraduates: development and evaluation study. *JMIR Serious Games, 10*(3), 1-12.

Yamazaki, Y., Toyama, M., & Ubed, R. S. (2018). Exploring how learning style relates to general and career management self-efficacy beliefs in a managerial context. *Organization Management Journal, 15*(4), 201-213.

Yuan, L., Kim, H. J., & Min, H. (2023). How Cultural Intelligence Facilitates Employee Voice in the Hospitality Industry. *Sustainability, 15*(11), 8851-8866.

Yuan, C. C., & Lo, S. H. (2018). Relationship among team temporal leadership, competency, followership, and performance in Taiwanese pharmaceutical industry leaders and employees. *Journal of Career Development, 45*(3), 227-238.

Yukl, G., Mahsud, R., Prussia, G., & Hassan, S. (2019). Effectiveness of broad and specific leadership behaviors. *Personnel Review, 48*(3), 774-783.

Zadeh, M.R, Hackney, R., & Zeng, J. (2022). Augmenting learning processes of absorptive capacity for innovation: Insights for effective leadership within global pharmaceutical companies. *European Management Review, 19*(2), 263-284.

Zaini, Z. H., & Mansor, M. (2021). The influence of the transformational leadership of the headmasters on the professional development of preschool teachers. *Jurnal Manajemen Pendidikan: Jurnal Ilmiah Administrasi, Manajemen Dan Kepemimpinan Pendidikan, 3*(1), 56-74.

Zhong, Y., Zhu, J. C., & Zhang, M. M. (2021). Expatriate management of emerging market multinational enterprises: a multiple case study approach. *Journal of Risk and Financial Management*, 14(6), 252.

Zumitzavan, V. (2011). *The impact of managers' learning styles and leadership styles and the effectiveness of their organisations: a case study from small retail tyre companies in Thailand* (Doctoral dissertation, University of Birmingham).

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Case Study

Investigating Consumer's Perceived Value in B2C Model of Electronic Commerce: A Research Framework and an Empirical Case Study

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Abstract

This study builds upon previous research on the value propositions of electronic commerce for the consumer and proposes a research framework for investigating consumer's perceived value in the B2C model of electronic commerce. The proposed research model encompasses five main dimensions of consumers' value proposition: Economic (3 components), Functional (7 components), Emotional (6 components), Social-Symbolic (5 components), and Technical (11 components). The paper also presents an application of the model to an empirical case study of consumers' perceived value of online shopping in Iran. Required data was collected via a survey from customers of digikala, the biggest e-commerce firm of Iran. Structural equation modeling and path analysis were used to test the proposed research model. Findings show that the five dimensions are positively related to consumers' value proposition and the proposed research model is fitted to explain the research purpose and hypotheses.

Keywords: B2C model, consumer's perceived value, e-customer, electronic commerce.

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Introduction

Internet has become an important accelerator for the world trade (Gabrielsson & Gabrielsson, 2001; Petersen, et al, 2002). For example, every year Alibaba.com offers hundreds of millions wholesale products for buyers in more than 190 countries (Alibaba.com, 2015). Retailers can now deliver customers with products and services via a variety of channels, including online websites, smartphone apps, and social media, thanks to advances in digital technology (Aswani et al., 2018; Sun et al., 2020). To meet diverse needs, consumers expect to alternately use different channels and touchpoints to complete the whole decision-making process (Alexander & Cano, 2020), which promotes the evolution of the B2C e-commerce model (Verhoef et al., 2015). In recent years, Pundits (such as the Bakos, 1991; Deighton & Kornfeld, 2009; Kozinets, 1999; Shipman, 2001) has introduced the emergence of a new kind of consumer-business relationship as a result of the emergence of Internet, that is partly because of shifting power from producer to the consumer. Internet has enhanced Consumer's power of bargaining, greater transparency, lower transaction costs, and more options for buying (Kucuk & Krishnamurthy, 2007). The online channel advantages (such as convenience, information availability, and accessibility at any time) can effectively reduce consumers' search costs, evaluation efforts, time costs (Shakir Goraya et al., 2020), and risk uncertainty (Molinillo et al., 2021). As powering consumers on the Internet, the consumers' expectations of retailers have been raised. Today, consumers who are normally tend to complain directly to merchants, there are more opportunities to do so. Easy and accessible Internet acts as a community that allows consumers potentially send their compliant as a massage to a worldwide recipient (Lee & Cude, 2012; Ward & Ostram, 2006). E-commerce can be defined as the interaction between a company and other companies or customers (Shamsafar & Sharbafazari, 2008). E-commerce is the process of buying, selling or exchanging goods, services and information via computer networks, including the Internet (Ma & Wei, 2012; Langron, Thulani & Tofara, 2010). Given to the extremely complex nature of the business, its highly competitive environment, and diversity of the clients (Lombardi & Gorgoglione, 2013); e-commerce has played a critical role in economic development in industrialized countries and do it well (Vahidi, Yaghoubi & Mohanna, 2011) so that it can result in more effective marketing process, more effectiveness in processes, higher levels of customer satisfaction, and higher returns on investment (Panniello, Gorgoglione & Lombardi, 2013). E-commerce is not limited to buying and selling goods through the Internet, but includes all activities during the business. E-commerce is considered as a resource which improves the economy and speed up globalization and developing available technologies (Sharma, Sheth 2005). Investment in e-commerce organization can increase productivity and reduce costs. Studies show that e-commerce will lead to 21 to 70 percent savings on the costs of different activities. Statistics released by the World top 500 enterprises show that 34% of the company in 1995, and about 80% in 1996, have used this method to promote his own products. In 2006, online transactions worth 12.8 trillion dollars (Khanzadeh & Khani, 2008) and in 2015 it has been estimated nearly 40 trillion dollars.

In such a context it is important to identify and develop the consumer's perceived value. Consumer's perceived value as a source of the core competitiveness provides a foundation for understanding consumer behavior and decision process in retailing (Janssens et al., 2020). Consumer value encompasses the perceived value through using

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products and services in a shopping environment including all circumstances associated with his/her satisfaction. Consequently, the creation of consumer value is the highest value for her/him in order to succeed in business. This is more important in e-commerce. Little literature was found to explore the association between online channel advantages and consumer perceived value, some important channel attributes considered as channel advantages were found to have a positive impact on Consumer's perceived value. Search convenience in webrooming behavior (Shankar and Jain, 2021), portability in the e-commerce context (Yang et al., 2021), and greater information availability in the e-commerce (Noble et al, 2005) are found to be positively associated with Consumer's perceived value. Important implication and outcomes in achieving consumer value are satisfaction and loyalty of customers in the long term and also gaining competitive advantage and brand relationship performance (Zhao et al., 2022) which are the achievements for both consumer side and firm side. Accordingly, identifying and modeling of consumer's perceived value in the context of e-commerce is the main purpose of this research. Thus, the main research question is: what is the consumer's perceived value in the B2C model of electronic commerce in Iran? Especially with focus on the biggest firm of the field in Iran, Digikala. This research aimed to present a proposed research model to answer this question and to provide contributions to the theory and practice.

Theoretical Background

Electronic commerce models

E-commerce is one of the sectors impacted mainly by the evolution of digital platforms. For instance, Amazon Marketplace, which connects manufacturers with end consumers, has continued to grow by an average of 35% every quarter since 2017 (Amazon, 2022), and the software-as-a-service platform Shopify has increased its turnover in the last five years more than tenfold, reaching almost 3 billion dollars in 2020 (Shopify, 2021). The evolution of these platforms has favored the emergence of newer approaches to online sales as opposed to the traditional indirect selling approach in which a SME manufacturer sells to an e-commerce reseller (whether a pure player or an omnichannel retailer), who then resells to the end consumer in a conventional business-to-business-to-consumer (B2B2C) dynamic (Chen et al., 2021). In particular, third-party e-commerce platforms such as Amazon Marketplace, eBay or Alibaba are increasingly gaining consideration within the online commerce marketplace, prompting SME manufacturers to adopt the so-called agency selling approach, in which the manufacturer relies on these third-party multi-sided platforms and sells directly to its end consumers via its platform account (Pu et al., 2020). A business model describes the intention of a company to create and capture value to relate new IT environments with business strategies (Hawkins, 2003). It is estimated that there are about 50 models for electronic business. There are several ways to describe these models (Long, Harrison-Walker2003). The researchers use marketing trends, products, prices, places and promotion describe electronic business models (Strauss & Frost 2001, Shin 2001). Models of e-commerce express structural features across the value chain of suppliers and buyers (Gordijn & Akkermans, 2001) IT systems and architecture (Afuah & Tucci, 2001), technical platforms (Lynda & Applegate, 2001) and security (Toraby et al, 2002). But since a very few companies use online method for selling their products, this model is limited

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application in developing countries. Many service providers in developing countries have created practical business models. Some argue that e-commerce is a key competitive advantage, if being used effectively in market (Bui & Jones, 2006). The term "Electronic business model" (business model or business model of e-commerce) or first introduced by IBM in 1990 as the transmitter key business processes through the use of Internet-based technologies (Li, 2007). An electronic business model is a vital basis for developing e-commerce system applications (Gordijn & Akkermans, 2011). A business model is defined as architecture for software and information services, include descriptions of various business elements and their roles, the potential benefits for various factors, and different revenue sources (Timmers, 1999). Business models have developed by entrepreneurs or managers to form and design the organization's activities as a connection between different activities and a system. Such a purposeful design across company boundaries is the essence of business model (Amit & Zott, 2009).

Consumer's perceived value

In recent years, the consumer's perceived value has received widespread attention (Hou and Sarigöllü, 2021). It plays an important role in predicting purchasing behaviour, achieving sustainable competitive advantage, and influencing relationship management (Chang and Wang, 2011). Consumer perceived value was the strategic priority of producers and retailers in the 1990s, and continues to be of great significance in the 21st century. It refers to the consumer's evaluation of product (or service) utility, which is based on consumers' perception of the "gain" and "give" of products (Sweeney & Soutar, 2001). Consumers' perceived value is not unilateral: it is a multi-dimensional concept. Therefore, most scholars use multi-dimensional methods to divide it (Lin et al., 2005). Sheth et al. (1991) put forward a theory to explain why consumers make choices (Sheth et al., 1991), and divided consumer perceived value into five dimensions, including social value, emotional value, functional value, cognitive value and conditional value. Wan et al. examined the perceived value of online customisation experience from the perspective of customer experience (Wan et al., 2017), and believe that perceived value includes service value, product quality, currency price and time cost. Petrick (2002) established a multi-dimensional service perceived value measurement scale (Petrick, 2002). According to its structure and dimensions, perceived value includes emotional value, quality value, price value and social value.

Creating consumer's perceived value in electronic commerce

Affordance theory has been applied to creating consumer's perceived value in electronic commerce in recent literature (Bayer et al., 2021), especially from a consumer perspective. For instance, Bayer et al. (2021) has reviewed online shopping studies and reinterpreted them from an affordance perspective, identifying seven key consumer-related e-commerce affordances: electronic transactions, temporal interdependence, online platforms, information transparency, and social interactions, as well as tailored and proactive services. Among these, one of the most studied affordances is social interaction. Works on online social platforms like WeChat or e-commerce platforms like Taobao identify interactive or dynamic shopping-experience characteristics, including metavoicing, social networking, and parasocial information (Wang et al., 2022). According to Shao and Pan (2019), media richness and interactivity promote social

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interaction affordance and, thus, online social platform user participation. Information transparency also relates to Bayer et al.'s (2021) analysis of social interaction affordance. Specifically, e-commerce platforms encourage visibility, direction, and bullet information affordances (Sun et al., 2019, Wang et al., 2022). The visibility affordance arises from product information and photographs. Therefore, it may fall under information transparency, while guiding information and bullet information, which allude to other users' reviews of the product or the streamer's explanations, overlap with social interaction affordance. Lehrer et al. (2018) take a different stance, focusing on the affordances that organizations might actualize by employing big data analytics. Specifically, using business e-commerce platform functionalities helps promote service innovation. De Luca et al. (2021) also conclude that big data affordances drive service innovation. Another concrete example of service innovation is virtual reality, which affords online shoppers to virtually try on garments, leading to a greater intention to buy (Tawira & Ivanov, 2022). However, firm-focused affordance research on e-commerce platforms is scarce. Few managerial e-commerce affordances have been identified in the literature, and assessing what corporate decisions and processes contribute to affordance actualization remains an unresolved challenge (De Luca et al., 2021).

Method and measures

This paper in terms of its purpose is applied research. The current research was conducted with a mixed approach and in two main phases. In the first phase of this research, using the qualitative research method of the systematic review of the research background of Okoli & Schabram (2015), the components and sub-components influencing the consumer's perceived value in electronic commerce in the four stages of planning, selection, extraction and execution, were identified. In the planning stage, by determining the goal and subject area of the research, related articles from 1988 to 2022 using the keywords "electronic commerce" and "consumer's perceived value" in the Web of Science, Scopus and Google Scholar databases were found. Then, in the selection stage, these articles were examined from the point of view of non-repetition, appropriateness of the title, abstract and conclusion in the screening process, and finally 33 articles were selected as selected articles. In the extraction phase by studying the selected articles, the components affecting the consumer's perceived value in electronic commerce were identified, and in the execution phase, using qualitative content analysis and open and central coding, the initial conceptual framework was developed. Figure 1 showed a systematic guide to literature review development.

The second phase of the research with a quantitative research method of the survey type includes determining the statistical population, preparing the questionnaire, checking the validity of the questionnaire, distributing the questionnaire, checking the reliability of the questionnaire and evaluating the conceptual framework presented using statistical tests. At this stage, with using a self-administered questionnaire based on the findings of the previous phase of research required data was gathered. Likert scale in this research include: strongly agree=1, agree=2, neutral=3, disagree=4, and strongly disagree=5. By means of the Likert scale required data was gathered among statistical population was include customers of Digkala. Digikala is the main electronic company in the B2C model of ecommerce in Iran. This company is the largest online shop in Iran and the average daily more than 850 thousand visitors (Iran's digital start-ups signal changing times)

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which is based in Tehran. In the survey phase among the research statistical population a sample consist of 300 online customers using probabilistic method were chosen. Then using convenient statistical software includes SPSS and LISREL, both analyses encompass measuring and structural analyses were implemented. Accordance with the findings arisen from the appropriate analyses, final research model will be presented and explained.

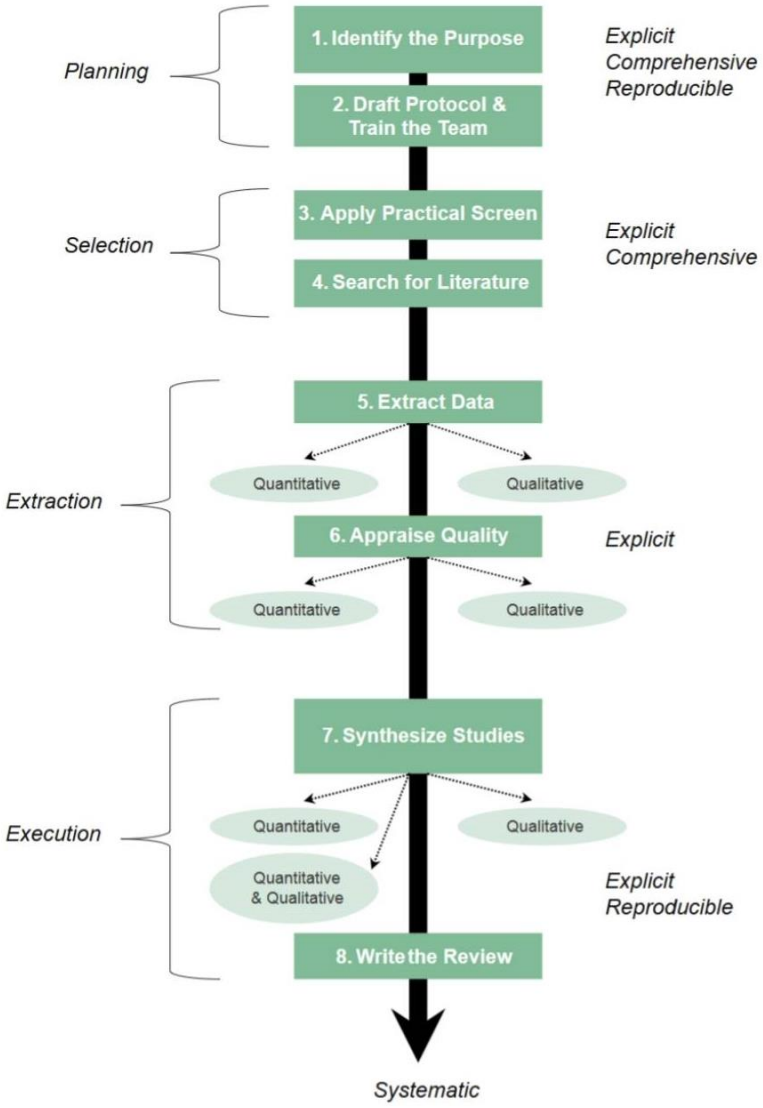

Figure 1: A systematic guide to literature review development

Development of a conceptual framework for components affecting consumer's perceived value in the B2C model of electronic commerce

In order to achieve the research model and then formulate hypotheses, we first explain and describe detected different consumer's perceived value. Then, we provide relevant hypotheses following each of the identified consumer's perceived value. Finally, according to the proposed hypotheses conceptual model will be extracted, introduced and presented.

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Economic consumer's perceived value

Price is among the strongest factors for customer value (Smith & Nagle, 2005). By definition economic value is "to adjust monetary value of the product to the customer for the availability of competitive alternative products". In other words, the economic value will be the lowest price or the best tradeoff between quality and price definition (Gale, 1994; Zeithaml, 1988). A value proposition economics usually requires resources and competence in an economic scale. Wal-Mart is a common example of a company that its competitive advantage based on purchasing volume, efficient distribution systems, and using information technology to simplify the supply chain (Tong and Tong, 2006). Using these sources, Wal-Mart is able to promise customers "always low prices", and a providing a clear economic value for customers. Economic value to the customer is a framework based on a simple observation that focuses on McKinney's strategy: determining the economic value, the value that the customer receives from the goods. The economic value of customers is the purchase price that customers are simply willing to pay for goods and services (Globe and Hindi, 1981).

H_1. *The economic consumer's perceived value and its identified components are among the influencing factors in B2C business model of e-commerce in Iran.*

Functional consumer's perceived value

Customers, whose initial motives are the appropriate options, seek for functional value. Sheth, Newman and Gross (1991) defined the functional value as "experienced current understanding of a potential alternative to applied, practical or physical function of product or service". For a retail buyer, the applied value can be as finding the right products with minimal time and effort that can be physical or cognitive. Perceived time value minimizes sacrifice against benefit (Babin, Darden and Griffin, 1994). Applied value creation is often achieved by producing products needed by customers, and processes that enhance the shopping experience at different stages (for example, Seiders, Berry, and Gresham, 2000). Tesco is a British retailer which won its competitive advantage by generating super functional value for clients. For example: mechanized buying production, personnel training, and designing convenient shopping experience. Tesco's commitment is to focus on deliver functional value to the customer. Tesco's summarized value proposition is "any little helps" that is successfully communicated to customers as well as employees. Any little help is the abstract of five promises: the path is clear; I can get whatever I want; price is good; I'm not in the queue, and the staff is perfect (Sheth & Randall, 2005).

H_2. *The functional consumer's perceived value and its identified components are among the influencing factors in B2C business model of e-commerce in Iran.*

Emotional consumer's perceived value

Customers gain emotional value by experimental aspects of buying and appreciated by our motivated retailers that receive emotional value. Emotional value can be defined as "the desirability of alternative capacity to arouse emotions or emotional desire" (Sheth et al., 1991; Arnold and Reynolds, 2003). There are different concepts of experimental

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needs and demands of retailers, or "fun shopping incentives". It contains enjoy shopping with friends and family, hunting bargain, and adventure or relaxation. In addition to being a tool to get the required products, the shopping experience is done for its own sake (Babin et al, 1994; Holbrook and Hirschman, 1982). And this is an approval for the effectiveness of store experience and personalized service environment (Turley and Milliman, 2000). The senses of sight, hearing, smell, feel, and even taste clue can be an effective way to create emotional value customer. Carbone (2004,) stated that "careful strategic planning provides a creative discipline of experiences that enable system stability and experience as connection controller in customer value". In many recent examples of retails, there is a high spirit for using this opportunity (eg. the shop NikeTown). For additional services (eg. Wi-Fi, in-store cafe's, etc.), Customers are encouraged to spend their time in shopping and enjoy it. Barnes & Noble, the largest bookseller in the world and a 500 Fortunes company, is a classic example of a company that provides a different emotional value proposition. It is the first book retailer which provides a comfortable environment. By introducing in-store cafes, Buyers are encouraged to relax and spend leisure time browsing books. Emotional value proposition can be known as a combination of economic value and functionality. "Trader Joe's" for example, is a grocery store which combined economic and emotional value in its value proposition. This is a place that many customers go there with the logic of emotional motivation: to save money, looking for news and enjoy the thrill of bargain hunting. The company finds its economic value in the direct purchase and using its brands.

H_3. *The emotional consumer's perceived value and its identified components are among the influencing factors in B2C business model of e-commerce in Iran.*

Social-symbolic consumer's perceived value

Customers are motivated by their experience of appreciating retailers; we can call this social value. The symbolic value of a product or customer experience can be expressed as positive use by customer itself or the others (for example, Belk, 1988; Smith and Colgate, 2007; Solomon, 1983). According to Flint (2006) "Symbols are certain types of social issues that are being used for something"; they have a special meaning and are used when a common meaning is transported to a recipient or the person (for example communication itself). The symbolic is presentation something other for the intent other than obvious use of a product. For example, Sheth et al (1991) states: "Even generic products, which are generally thought to be elected based on the functional value and benefits often are elected based on social values" (Sirgy et al, 2000). Dedication related to the symbolic value includes the risk of selecting a brand or retailers that is negative in connotations of use. As a value proposition, the symbolic value is detected based on personal experience of social interpretation code in use. For example, the value proposition of Body Shop is "made by passion" that is based on five corporate values: "In favor of animal rights, global trade protectionism, boost confidence, defend human rights, protect our planet" (Body Shop, 2007). These symbolic meanings are important, and are themselves represent personal experience of Body Shop's customers. Symbolic value can be combined with other value propositions. Fourth (in terms of revenue) United States retailer giant, introduced its cause different from mere success in the competition via the profile as "luxury discount" (Berman and Evans, 2007). The purpose is to create

economic and symbolic value by offering branded products with designed attractive prices in a certain retail environment.

H4. *The Social-symbolic consumer's perceived value and its identified components are among the influencing factors in B2C business model of e-commerce in Iran.*

Technical consumer's perceived value

Technical value refers to technical function of a service provider. Technical consultants or executive personnel of services should provide technically good business services. They often intensely adhere to the standardization of tangible products (Desarbo, 1998). The concept of technical value relates to functional factor, which requires comparing technical, career, procedural etc. aspects to the industrial standard.

H5. *The Technical consumer's perceived value and its identified components are among the influencing factors in B2C business model of e-commerce in Iran.*

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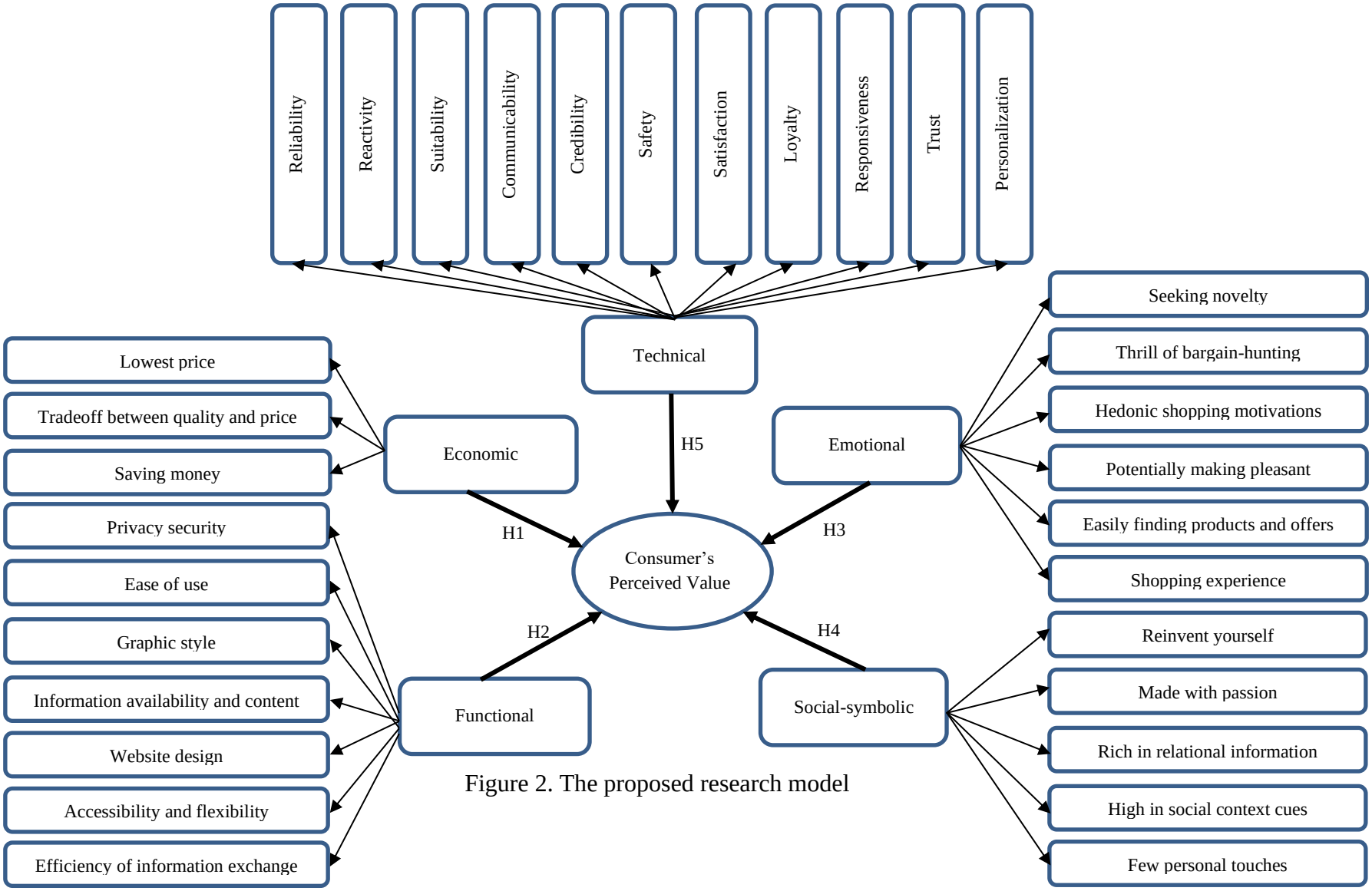

Figure 2. The proposed research model

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Table 3. The detailed research model's dimensions and related factors

Dimensions	Factors	Authors/Year
Economic	Lowest price	Bayer et al. (2021); Gale (1994) Zeithaml (1988)
	Tradeoff between quality and price	Gale (1994); Zeithaml (1988)
	Saving money	De Luca et al. (2021); Wan et al.(2017); Byrne (2004)
Functional	Privacy security	Zeithamit et al (2002)
	Ease of use	Yang et al (2001); Lohse and Spiller (1998)
	Graphic style	Lwarrden et al (2004)
	Information availability and content	Sun et al. (2019); Wang et al., 2022); Yang et al (2001); Delone and McLean (1992)
	Website design	Bayer et al. (2021); Kim & Lee (2002); Parasuraman et al. (1988)
	Accessibility and flexibility	Wallace et al. (2004)
	efficiency of information exchange promote service innovation	Choudhury & Karahanna (2008) Lehrer et al. (2018); De Luca et al. (2021); Tawira & Ivanov (2022)
Emotional	Seeking novelty	Byrne (2004)
	Enjoying the thrill of bargain-hunting	Byrne (2004)
	Hedonic shopping motivations	Arnold & Reynolds (2003)
	Potentially making pleasant	Duff, (2006)
	Easily finding products and offers	Duff, (2006)
	Update and differentiate the shopping experience	Wan et al.(2017); Duff, (2006)
Social-symbolic	Reinvent yourself	Baar, (2000)
	Made with passion	Body Shop, (2007)
	Rich in relational information	Cyr et al. (2007)
	High in social context cues	Wang et al. (2022); Shao and Pan (2019); Petrick (2002); Cyr et al. (2007)
	Few personal touches or social cues	Bayer et al. (2021); Cyr et al. (2007); Davis et al. (2011)
Technical	reliability	Bayer et al. (2021); Parasuraman et al, (1988); Zhu et al (2002); Kim & Lee (2002)
	reactivity	Parasuraman et al, (1988)

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Dimensions	Factors	Authors/Year
	suitability	Parasuraman et al, (1988)
	communicability	Parasuraman et al, (1988)
	credibility	Parasuraman et al, (1988)
	safety	Parasuraman et al, (1988)
	satisfaction	Wan et al.(2017); Lin et al, (2005); Zhu et al, (2002); Kim & Lee, (2002); Anderson & Sullivan (1993); Yang et al, (2005)
	loyalty	Lin et al, (2005)
	responsiveness	Parasuraman et al, (1988); Kim & Lee, (2002); Wallace et al, (2004)
	trust	Mcknight et al (2002); Kimery & McCard, (2002)
	personalization	Parasuraman et al, (1988); Yang et al, (2005)

Data analyses

At the first part of the data analysis, the descriptive statistics, mainly demographic characteristics, of the sample of research are assessed. In terms of gender, the distribution of the sample was 57.3% for male and 42.7% for female; According to the age, the under 20 and 20-35 are the lowest and highest respectively; and also based on the education bachelor degree and then Master degree (graduate) have the most frequencies among all categories in this parameter.

Table 4. The demographic characteristics of the sample

Demographic variables	Frequency	cumulative frequency	Percentage	Cumulative percentage
Gender				
Male	172	172	57.3	57.3
Female	128	300	42.7	1
Age				
< 20	14	14	4.7	4.7
20-35	149	163	49.6	54.3
35-50	110	273	36.7	91
> 50	27	300	9	1
Education				
Diploma	42	42	14	14
BS	125	167	41.7	55.7
MSc	103	270	34.3	90
PhD and higher	30	300	10	1
Total	300	-	1	-

To measure the validity of this research both qualitative and quantitative approaches, namely experts and statistical analyses, were used. After applying experts' views in

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modifying research tool, using the Exploratory Factor Analysis (EFA) the validity of the research was determined. By implementing factor analysis, the extracted shared value amounts of all factors in questionnaire were above than 0.5 and were remained in the analysis. The value amounts of factor loadings of all dimensions and factors of research were calculated between 0.745 and 0.895 which illustrated the high influences of dimensions and factors identified in order to explain the research model in this research. Also, the KMO criterion for this research was 0.792 (above 0.60) which was demonstrated sampling adequacy.

Table 5. Results of sampling adequacy and Bartlett's test

Test	Results
KMO of Sampling Adequacy	0.792
Bartlett's Test of Sphericity	12052.054
df	1225
Sig.	0.000

Finally, to meet the reliability using cronbach's α all parts of the research separately were tested. The Cronbach's Alpha of total research was calculated as 0.895 which demonstrated the high reliability of this study. The calculated cronbach's α for all parts were above 0.70 (Nunnally, 1978); these calculated amounts were between minimum 0.855 and maximum 0.911.

Table 6. Results of reliability test for research tool

Dimensions	N of factors	N of questions	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Economic	3	5	8.8068	3.925	0.617	0.436	0.911
Emotional	7	10	8.8969	4.031	0.776	0.612	0.864
Functional	6	10	9.0429	4.205	0.788	0.730	0.877
Social-Symbolic	5	8	8.8975	4.059	0.760	0.649	0.858
Technical	11	17	9.0791	4.180	0.840	0.782	0.855

In order to assess the situation of each dimension and also explore the effects of these dimensions on the research proposed model the one sample t test is implemented. The result of this test is presented at the table 7. Based on the measured Mean and Sig value of this test at 99% confidence level, all dimensions of research have been confirmed. This indicates that all the dimensions identified in this study are affecting the value propositions of consumers in the research and hence this test demonstrates the affectability of related dimensions and factors on the proposed research model.

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Table 7. The results of one sample t test to measure the main dimensions

Dimensions	N	Mean	SD	t	df	Sig.	Mean Difference	95% Confidence Interval	
								Lower	Upper
Economic	300	2.3740	.72194	-15.019	299	.000	-.62600	-.7080	-.5440
Functional	300	2.2290	.55508	-24.058	299	.000	-.77100	-.8341	-.7079
Emotional	300	2.1260	.53821	-28.127	299	.000	-.87400	-.9352	-.8128
Social-Symbolic	300	2.0155	.57698	-29.553	299	.000	-.98446	-1.0500	-.9189
Technical	300	2.2984	.54617	-22.249	299	.000	-.70157	-.7636	-.6395

SEM model and results

In order to test the structural situation of the conceptual research model the SEM (Structural equation modeling) is used based on the LISREL approach. The output of SEM is including to basic modes: standardized solutions or coefficient and significance circumstances. Figure 3 shows the structural model according to standardized coefficients. Five main dimensions of the proposed research model including Economic, Emotional, Functional, Social-Symbolic, and Technical with their related standardized coefficients are illustrated in this figure. Results of SEM as standardized solutions mode show that five basic identified dimensions in this research are positively related to consumer's value propositions in the B2C model of e-commerce in Iran. Path coefficients are between 0.63 (as minimum amount for Economic dimension of consumer's value proposition) and 0.93 (for maximum amount for technical dimension of consumer's value proposition).

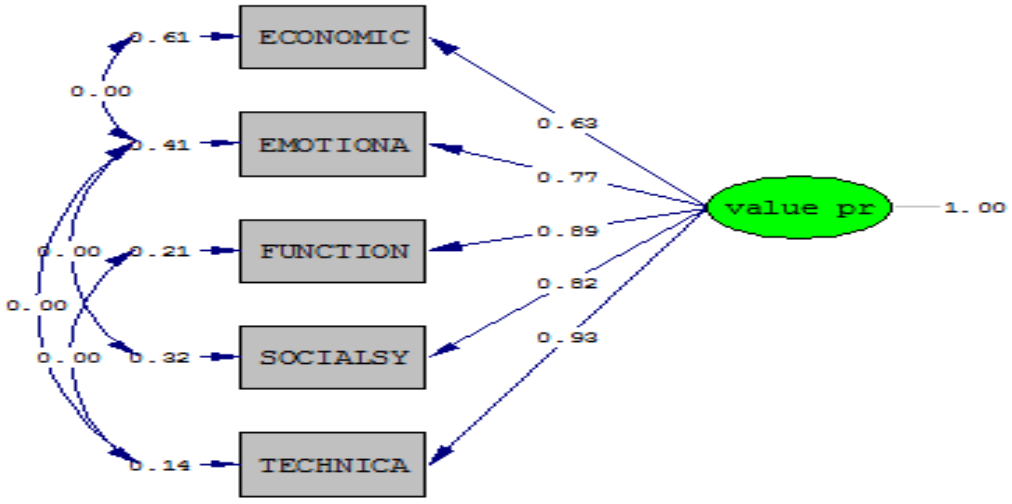

Figure 3. Structural equation modeling in the standardized solutions mode

Also, the proposed research model based on the t-values is presented in the figure 4. In order to achieve the significant relationships and meaningful structural model, with regard to this important issue that the acceptable confidence level is 0.95 and α=0.05, all

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calculated t-values, according to the significance mode of measured research model, are outside the range of ±1.96; As figure 4 presents, all calculated amounts of paths between basic dimensions and consumer's value are significant and thereby are confirmed. Therefore, model is able to explain the significant-confirmed relationships among identified variables of research and could eventually provide a clear picture of consumer's value propositions.

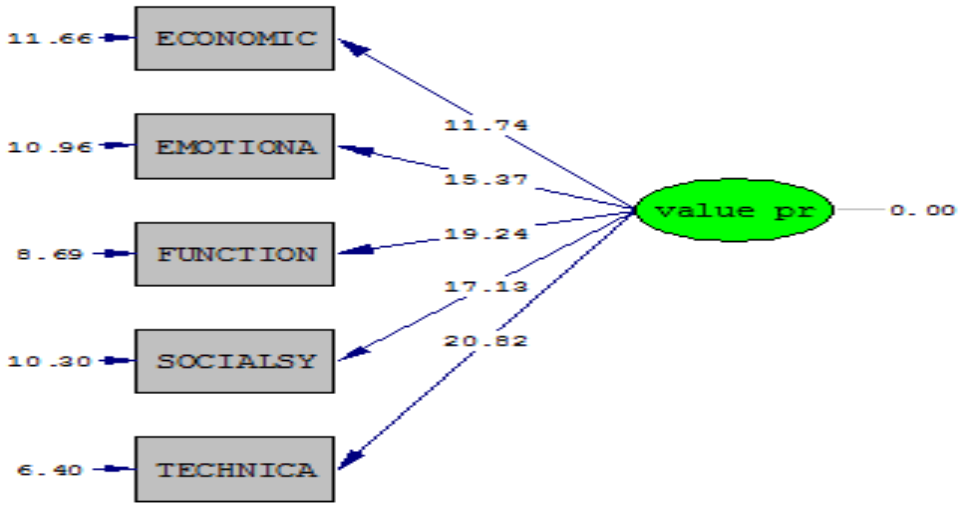

Figure 4. Structural equation modeling in the significance mode

To address the proposed research model according to goodness-of-fit indices, table 8 provides the most important fitness indices. In order to examine these indices and make a decision it is enough to compare the calculated amounts in this study with the recommended values (or standard amounts). As the table presents, fitness indices are in a good condition and able to investigate and measure the proposed research model.

Table 8. Results of the model goodness-of-fit

Fit indices	Structural model	Recommended value
χ^2/df	2.663	< 3
GFI	0.940	> 0.8
AGFI	0.810	> 0.8
RMSEA	0.017	< 0.08
CFI	0.970	> 0.9
P-Value	0.000	< 0.05

Conclusion, limitations and directions for future research

The results of this study provide consumer's value propositions in terms of main identified dimensions and also their related identified components for the B2C model of e-commerce in Iran. This research has tried to design a proposed conceptual model to explain these identified dimensions and related components. For this purpose, according to figure 1, the hypothesized proposed research model, five hypotheses were presented. The results of analyses are provided in the table 9. To achieve convenient investigation

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of the hypotheses table 9 presents basic parameters including path coefficients, critical ratios, p-values, along with the five basic hypothesized relationships in form of abbreviations. As table 9 shows all research's hypotheses not rejected and accordingly, all hypotheses which indicates the basic dimensions of consumer's value proposition are confirmed and then accepted.

Table 9. Results of hypothesis testing

Hypothesis	Hypothesized relationship	Path coefficient	Critical ratio	P-value	Decision
H1	Econ. → CVP**	0.63*	11.74	0.000	Not rejected
H2	Func. → CVP**	0.89*	19.24	0.000	Not rejected
H3	Emot. → CVP**	0.77*	15.37	0.000	Not rejected
H4	Soci. → CVP**	0.82*	17.13	0.000	Not rejected
H5	Tech. → CVP**	0.93*	20.82	0.000	Not rejected

Note: * $p < 0.05$., ** CVP: Consumer's Value Proposition

Competitive customer value proposition is more than a slogan. In fact, it is a concept of the strategy that helps customer relations and company approaches to create value and ultimately competitive advantage for the company. Customer value proposition represents a complete customer experience and reduces customer risk by ensuring the provided services (Kandampully and Butler, 2001). By providing values in the electronic businesses, we attempt in this article to lead the company's strategies focus on customer needs and desires in order to organize companies to gain competitive advantage in the industry. Based on this framework, the following results were obtained:

- Identifying customer value proposition by understanding the key aspects that motivate the target customers;

- Developing customer value proposition with respect to implemented evaluation hierarchy and combination of economic, functional, technical, personal and social propositions; and

- Assessing the competitive value proposition based on the compatibility with the resources and competencies required in delivering value.

In this study, we examine the consumer value proposition with focus on the Digikala Company as a case study which is active in the field of e-commerce in the country. The proposed value is a distinct combination of elements that met the needs of a part of customers, and through which create value. According to the Economist Journal report, in 2014 this website with a capital size of 150 million $ has the first rank in e-commerce companies in Iran. By collecting data through questionnaires and analyzing and prioritizing them, we identified provided five values for the Digikala Company in the developing country, Iran, in order of economic, emotional, social, functional and infrastructural values, so all hypotheses were effectively confirmed. Compared to the Amazon Company in the United States where the order and importance of values are infrastructure, economic, social, functional, and support (Amazon, 2012).

Since communications infrastructure is considered one of the necessities and requirements of e-commerce, and also one of the threats for the development of e-commerce in Iran and other countries, this entailed providing prerequisite for the realization of the investment in information and communication infrastructure. In addition, there are some obstacles on the way of using e-commerce in some countries, caused by restrictions in the investment that need more attention. It is clear that studies of this kind should continue. Therefore, it is recommended that interested researchers with the problem, to add its richness.

Suggestions for future research

Researchers in their future studies can further focus on the field of successful Iranian companies in e-commerce, and to develop and explain more values considered by customers of this business model and identify more values. In this study we didn't focus on support value proposition for customer which has a great importance for customer and for the continuation of the relationship in the organizations. This can be further considered in future studies.

Limitations

Lack of familiarity with the Digikala site in using it, especially in elderlies is considered as one of limitations in this study. Among other restrictions we can point to unfamiliarity of the audience with value and similar topics and lack of people understanding from their needs and their selves.

References

Abdelkafi, N., Makhotin, S. (2013). Business Model Innovations for Electronic Mobility: What Can Be Learned from Existing Business Model Patterns?. *International Journal of Innovation Management*, 17(1), 1-41.

Afuah, A. (2005). *Business Models: A Strategic Management Approach*. McGraw-Hill, New York.

Afuah, A., & Tucci, C.L. (2001). *Internet Business Models and Strategies*. Irwin Publications, Boston.

Agarwal. A., Shankar, R., & Tiwari, M.K. (2007). Modeling agility of supply chain. *Industrial Marketing Management*, 36(4), 443-457.

Alexander, B.; Cano, M.B. (2020). Store of the future: Towards a (re)invention and (re)imagination of physical store space in an omnichannel context. *J. Retail. Consum. Serv*, *55*, 101913.

Alt, R. & Zimmerman, H.D. (2001). Introduction to Special Section on Business Models. *Electronic Markets*, 11, 3-9.

Amazon. (2022). Amazon third party seller services value growth 2021. Statista. https://www.statista.com/statistics/1242338/amazon-third-party-seller-services-value-growth/.

Anderson, E. & Sullivan, M. (1993). The antecedents and consequences of customer satisfaction for firms. *Marketing Science*, 12(1), 125-143.

Anderson, J.C., Narus, J.A. & Van Rossum, W. (2006). Customer value propositions in business markets. *Harvard Business Review*, 84(3), 91-9.

Arnold, M.J. & Reynolds, K.E. (2003). Hedonic shopping motivations. *Journal of Retailing*, 79(2), 77-95.

Aswani, R.; Kar, A.K.; Ilavarasan, P.V.; Dwivedi, Y.K. (2018). Search engine marketing is not all gold: Insights from Twitter and SEOClerks. *Int. J. Inf. Manag*, *38*, 107–116.

Babin, B.J., Darden, W.R. & Griffin, M. (1994). Work and/or fun: measuring hedonic and utilitarian shopping value. *Journal of Consumer Research*, 20(4), 644-56.

Bagchi, S. & Tulskie, B. (2000). E-business Models: Integrating Learning from Strategy Development Experiences and Empirical Research. *20th Annual International Conference of the Strategic Management Society*, Vancouver.

Bakos, JY. (1991). A strategic analysis of electronic marketplaces. *MIS Quarterly*, 10(2), 295-310.

Ballantyne, D. & Varey, R.J. (2006). Creating value-in-use through marketing interaction: the exchange logic of relating, communicating and knowing. *Marketing Theory*, 6(3), 335-48.

Barney, J., & Arikan, A. (2001). *The Resource-Based View: Origins and Implications*. The Blackwell Handbook of Strategic Management.

Bayer, S., Gimpel, H., & Rau, D. (2021). IoT-commerce-opportunities for customers through an affordance lens. *Electronic Markets*, *31*(1), 27-50.

Belk, R.W. (1988). Possessions and the extended self", Journal of Consumer Research, 15(2), 139-68.

Berman, B. & Evans, J.R. (2007). *Retail Management. A Strategic Approach.* Prentice Hall, Upper Saddle River, NJ.

Bolton, N. & James H. (1991). A Multistage Model of Customers' Assessments of Service Quality and Value. *Journal of Consumer Research*, 17(3), 375-384.

Boyle, M. (2005). The king of cheap stuff", *Fortune*, 152(10), 220.

Bui, T.X., Le, T., & Wayne, D. (2006). Jones, An exploratory case study of hotel e-marketing in Ho Chi Minh City. *Thunderbird International Business Review*, 48(3), 369-388.

Byrne, J.A. (2004). Lessons from our customer champions. *Fast Company*, 87, 16.

Carbone, L.P. (2004). *Clued In: How to Keep Customers Coming Back Again and Again*. Prentice-Hall, Upper Saddle River, NJ.

Chen, C., Zhuo, X., & Li, Y. (2022). Online channel introduction under contract negotiation: Reselling versus agency selling. *Managerial and Decision Economics*, *43*(1), 146-158.

Choudhury, V., &. Karahanna, E. (2008). The Relative Advantage of Electronic Channels: A Multidimensional View. *Management Information Systems Research*, 32(1), 179-200.

Cronin, J., Brady, M.K., & Hult, G.T. (2000). Assessing the effects of quality, value, and customer satisfaction on consumer behavioral intentions in service environments. *Journal of Retailing*, 76(2), 193-218.

Currie, W.L. (2004). *Value Creation from E-Business Models*. Butterworth-Heinemann, Oxford.

Cyra, D., Hassanein, K., Head, M., & Ivanov, A. (2007). The role of social presence in establishing loyalty in e-Service environments. *Interacting with Computers*, 19(1), 43-56.

Davis, L.Y., & Dyer, B. (2012). Consumers' value perceptions across retail outlets: Shopping at mass merchandisers and department stores. *The International Review of Retail, Distribution and Consumer Research*, 22 (2), 115-142.

De Luca, L. M., Herhausen, D., Troilo, G., & Rossi, A. (2021). How and when do big data investments pay off? The role of marketing affordances and service innovation. *Journal of the Academy of Marketing Science*, *49*, 790-810.

Deighton, J., & Kornfeld, L. (2009). Interactivity's unanticipated consequences for marketers and marketing. *Journal of Interactive Marketing*, 23(1), 4-10.

DeLone, W.H. & McLean, E.R. (1992). Information Systems Success: The Quest for the Dependent Variable. *Information Systems Researc*h, 23(1), 23-41.

Desai, B., & Currie, W. (2005). Towards the ASP E-Business Model: A Conceptual Framework for Mapping ASP Specific Value Propositions. *Journal of Internet Commerce*, 4(1), 79-101.

Drucker. P. (1954). *The Practice of Management*. Harper & Row, New York.

Dubosson, M., Osterwalder, A., & Pigneur, Y. (2002). E-business model design, classification, and measurement. *Thunderbird International Business Review*, 44(1), 5-23.

Duff, M. (2006). Personal food shopper: Stop & Shop test looks to improve in-store experience. *Retailing Today*, 45(21), 10.

Edvardsson, B., Tronvoll, B., & Gruber, T. (2011). Expanding understanding of service exchange and value Co-creation: a social construction approach. *Journal of the Academy of Marketing Science*, 39(2), 327-339.

Flint, D.J. (2006). Innovation, symbolic interaction and customer valuing: thoughts stemming from a service-dominant logic of marketing. *Marketing Theory*, 6(3), 349-62.

Gabrielsson, M., & Gabrielsson, P. (2011). Internet-based sales channel strategies of born global firms. *International Business Review*, 20(1), 88-99.

Gale, B.T. (1994). *Managing Customer Value: Creating Quality and Service that Customers Can See*. The Free Press, New York, NY.

Gordijn, J., & Akkermans, H. (2001). Designing and evaluating e-business models, *IEEE Intelligent Systems*, 16(4), 11-17.

Hamel, G. (2000). *Leading the revolution*. Cambridge, MA: Harvard Business School Press.

Harrison, M.D., Choudhury, V., & Kacmar, C. (2002). Developing and Validating Trust Measures for e-Commerce: An Integrative Typology. *Information Systems Research*, 23(1), 23-41.

Hawkins, R. (2004). Looking beyond the Dot Com bubble: exploring the form and function of business models in the electronic marketplace, in: Bouwman, H. Preissl, B., & Steinfield, C. (Eds.), E-Life After the Dot-com Bust, Physica-Varlag, Heidelberg.

Holbrook, M.B. & Hirschman, E.C. (1982). The experiential aspects of consumption: fantasies, feelings, and fun. *Journal of Consumer Research*, 9(2), 132-40.

Holbrook, M.B. (1994). The nature of customer value: An axiology of services in the consumption experience (Book Chapter). In *Service Quality: New Directions in Theory and Practice*. Thousand Oaks, CA: Sage.

Holbrook, M.B. (Ed.). (1999). *Consumer Value: A Framework For Analysis and Research*. Routledge, London.

Hou, C., & Sarigöllü, E. (2021). Waste prevention by consumers' product redistribution: Perceived value, waste minimization attitude and redistribution behavior. *Waste Management*, *132*, 12-22.

Hsin Chang, H., & Wang, H. W. (2011). The moderating effect of customer perceived value on online shopping behaviour. *Online information review*, *35*(3), 333-359.

Janssens, K.; Lambrechts, W.; Keur, H.; Semeijn, J. (2020). Customer Value Types Predicting Consumer Behavior at Dutch Grocery Retailers. *Behav. Sci*, *10*, 127.

Kim, Y.K. (2002). Consumer value: an application to mall and Internet shopping. *International Journal of Retail Distribution Management*, 30(12), 595-602.

Kimery, K.M. & McCard, M. (2003). Identifying key factors affecting consumer purchase behavior in an online shopping context. *International Journal of a Retail and Distribution Management*, 31, 16-29.

Kozinets, R.V. (1999). E-tribalized marketing? the strategic implications of virtual communities of consumption. *European Management Journal*, 17(3), 252-264.

Kucuk, S.U., & Krishnamurthy, S. (2007). An analysis of consumer power on the Internet. *Technovation*, 27(1), 47-56.

Lee, G. & Lin, H. (2005). Customer perception of e-service quality in online Shopping. *International Journal of Retail & Distribution Management*, 33(2),161-176.

Lee, S., & Cude, B.J. (2012). Consumer complaint channel choice in online and offline purchases. *International Journal of Consumer Studies*, 36(1), 90-6.

Lehrer, C., Wieneke, A., Vom Brocke, J. A. N., Jung, R., & Seidel, S. (2018). How big data analytics enables service innovation: materiality, affordance, and the individualization of service. *Journal of Management Information Systems*, *35*(2), 424-460.

Li, F. (2007). What *Is E-Business? How the Internet Transforms Organizations*. Blackwell Publishing, Oxford.

Lin, C. H., Sher, P. J., & Shih, H. Y. (2005). Past progress and future directions in conceptualizing customer perceived value. *International Journal of Service Industry Management*, *16*(4), 318-336.

Linder, J., & Cantrell, S. (2001). *Changing Business Models: Surveying the Landscape*. A PhD Thesis, Accenture Institute for Strategic Change, Cambridge.

Lohse, G.L. &Spiller, P. (1998). Electronic Shopping. *Communications of the ACM*, 41(7), 81-88.

Lombardi, S., Gorgoglione, M., & Panniello, U. (2013). The effect of context on misclassification costs in e-commerce applications. *Expert Systems with Applications*, 40(13), 5219-5227.

Long, W., Lam, L., & Harrison, J.W. (2003). Toward an objective-based typology of e-business models. *Business Horizons*, 46(6), 17-26.

Lynda, M. (2001). *Applegate, emerging e-business models: lessons from the field.* Harvard Business School, Case No. 9-801-172.

Ma, B., & Wei, Q. (2012). Measuring the coverage and redundancy of information search services on e-commerce platforms. *Electronic Commerce Research and Applications*, 11(6), 560-269.

Mahadevan, B. (2000). Business Models for Internet-Based E-Commerce: An Anatomy. *California Management Review*, 42, 55-69.

Mohanna, S., Yaghoubi, N., & Vahidi, S. (2011). Limitations of E-commerce implementation in developing countries: case study of Iran. *American Journal of Scientific and Industrial Research*, 2(2), 224-228.

Molinillo, S.; Aguilar-Illescas, R.; Anaya-Sánchez, R.; Liébana-Cabanillas, F. (2021). Social commerce website design, perceived value and loyalty behavior intentions: The moderating roles of gender, age and frequency of use. *J. Retail. Consum. Serv*, *63*, 102404.

Namchul S. (2001). Strategies for competitive advantage in electronic commerce. *Journal of Electronic Commerce Research*, 2(4), 34-41.

Noble, S.M.; Griffith, D.A.; Weinberger, M.G. (2005). Consumer derived utilitarian value and channel utilization in a multi-channel retail context. *J. Bus. Res*, *58*, 1643–1651.

Nunnally, J. C. (1978). *Psychometric theory*. New York, NY: McGraw-Hill.

Ohmae, K. (1989). Planting for a global harvest. *Harvard Business Review*, 67(4), 136-145.

Okoli, C., & Schabram, K. (2015). A guide to conducting a systematic literature review of information systems research. *Communications of the Association for Information Systems*, 7(43), 879-910

Osterwalder, A., Pigneur, Y., & Tucci, C.L. (2005). Clarifying Business Model: Origins Present and Future of the Concept. *Communications of the Association for Information Systems*, 16(15), 1-25.

Osterwalder, A., Pigneur, Y., Bernarda, G., Smith, A., & Papadakos, T. (2014). Value Proposition Design: How to Create Products and Services Customers Want. Wiley Publications.

Parasuraman, A. (1997). Reflections on gaining competitive advantage through customer value. *Journal of the Academy of Marketing Science*, 25, 154-161.

Parasuraman, A., Zeithaml, V.A., & Berry, L.L. (1985). A conceptual model of service quality and its implications for future research. *Journal of Marketing*, 49, 41-50.

Pardo, P.D., & Martínez, C. (2003). Resistance to change: a literature review and empirical study. *Management Decision*, 41(2), 148-155.

Petersen, B., Welch, L.S., & Liesch, P.W. (2002). The Internet and foreign market expansion by firms. *Management International Review*, 42(2), 207–221.

Petrick, J. F. (2002). Development of a multi-dimensional scale for measuring the perceived value of a service. *Journal of leisure research*, *34*(2), 119-134.

Porter, M.E. (1985). *Competitive advantage: Creating and sustaining superior performance*. New York: Free Press.

Prahalad, C. & Ramaswamy, V. (2004). Co-creation experiences: the next practice in value creation. *Journal of Interactive Marketing*, 18(3), 5-14.

Pu, X., Sun, S., & Shao, J. (2020). Direct selling, reselling, or agency selling? Manufacturer's online distribution strategies and their impact. *International Journal of Electronic Commerce*, *24*(2), 232-254.

Seiders, K., Berry, L.L. & Gresham, L.G. (2000). Attention, retailers! How convenient is your convenience strategy?. *Sloan Management Review*, 41(3), 79-90.

Seth, A. & Randall, G. (2005). *Supermarket Wars: Global Strategies for Food Retailers*. Palgrave MacMillan, New York, NY.

Shakir Goraya, M.A.; Zhu, J.; Akram, M.S.; Shareef, M.A.; Malik, A.; Bhatti, Z.A. (2020). The impact of channel integration on consumers' channel preferences: Do showrooming and webrooming behaviors matter? *J. Retail. Consum. Serv*, *65*, 102130.

Shamsafar, A., & Sharbafazari, F. (2008). E-commerce is only solutions to implement Iran's progress. *Fourth Conference on Electronic Commerce*, Tehran, Iran.

Shankar, A.; Jain, S. (2021). Factors affecting luxury consumers' webrooming intention: A moderated-mediation approach. *J. Retail. Consum. Serv*, *58*, 102306.

Shao, Z., & Pan, Z. (2019). Building Guanxi network in the mobile social platform: A social capital perspective. *International Journal of Information Management*, *44*, 109-120.

Sheth, J. N., Newman, B. I., & Gross, B. L. (1991). Why we buy what we buy: A theory of consumption values. *Journal of business research*, *22*(2), 159-170.

Sheth, J.N., & Sharma, A. (2005). International e-marketing: opportunities and issues. *International Marketing Review*, 22(6), 611-622.

Sheth, J.N., Newman, B.I. & Gross, B.L. (1991). Why we buy what we buy: a theory of consumption values. *Journal of Business Research*, 22(2), 159-170.

Shipman, A. (2001). Privatized production, socialized consumption? old producer power behind the new consumer sovereignty. *Review of Social Economy*, 59(3), 331-52.

Shopify. (2021). Shopify: Global total revenues 2015–2020. Statista. https://www.statista.com/statistics/1075158/total-revenue-shopify-worldwide/.

Sinha, I. & DeSarbo, W.S. (1998). An integrated approach toward the spatial modeling of perceived customer value. *Journal of Marketing Research*, 35, 236-249.

Sirgy, M.J., Grewal, D. & Mangleburg, T. (2000). Retail environment, self-congruity, and retail patronage: an integrative model and a research agenda. *Journal of Business Research*, 49(2), 127-38.

Slater, S.F. & Narver, J.C. (1994). Market orientation, customer value, and superior performance. *Business Horizons*, 37(2), 22-8.

Smith, G.E. & Nagle, T.T. (2005). A question of value. *Marketing Management*, 14(4), 38-43.

Smith, J.B. and Colgate, M. (2007). Customer value creation: a practical framework. *Journal of Marketing Theory and Practice*, 15(1), 7-23.

Solomon, M.R. (1983). The role of products as social stimuli: a symbolic interactionism perspective. *Journal of Consumer Research*, 10(3), 319-29.

Strauss, J., & Frost, R. (2001). *E-marketing*. Prentice-Hall, Upper Saddle River, NJ.

Sun, Y., Shao, X., Li, X., Guo, Y., & Nie, K. (2019). How live streaming influences purchase intentions in social commerce: An IT affordance perspective. *Electronic commerce research and applications*, *37*, 100886.

Sun, Y.; Yang, C.; Shen, X.-L.; Wang, N. (2020). When digitalized customers meet digitalized services: A digitalized social cognitive perspective of omnichannel service usage. *Int. J. Inf. Manag*, *54*, 102200.

Sweeney, J. C., & Soutar, G. N. (2001). Consumer perceived value: The development of a multiple item scale. *Journal of retailing*, *77*(2), 203-220.

Tawira, L., & Ivanov, A. (2023). Leveraging personalization and customization affordances of virtual try-on apps for a new model in apparel m-shopping. *Asia Pacific Journal of Marketing and Logistics*, *35*(2), 451-471.

Thulani, D., Tofara, C., & Langton, R. (2010). Electronic commerce benefits and adoption barriers in small and medium enterprises in Gweru Zimbabwe. *Journal of Internet Banking and Commerce*, 15(1), 1-17.

Timmers, P. (2006). Business Models for Electronic Markets. Journal of Electronic Markets, 8, 3-8.

Tong, C.H. & Tong, L.I. (2006). Exploring the cornerstones of Wal-Mart's success and competitiveness. *Competitiveness Review*, 16(2), 143-9.

Turley, L.W. & Milliman, R.E. (2000). Atmospheric effects on shopping behavior: a review of the experimental evidence. *Journal of Business Research*, 49(2), 193-211.

Valarie A. (2002). *Measuring and Improving Service Quality: A Literature Review and Research Agenda*. In Handbook of Marketing, Bart Weitz, ed. Thousand Oaks, CA: Sage.

Van Der Vorst, J.G.A.J., Van Dongen, S., Nouguier, S. and Hilhorst, R. (2002). E-Business Initiatives in Food Supply Chains: Definition and Typology of Electronic Business Models. *International Journal of Logistics: Research and Applications*, 5, 119-138.

Vargo, S.L. & Lusch, R.F. (2004). Evolving to a new dominant logic for marketing. *Journal of Marketing*, 68(1), 1-17.

Verhoef, P.C.; Kannan, P.K.; Inman, J.J. (2015). From Multi-Channel Retailing to Omni-Channel Retailing: Introduction to the Special Issue on Multi-Channel Retailing. *J. Retail, 91*, 174–181.

Wallace, D.W., Giese, J.L. & Johnson, J.L. (2004). Customer Retailer Loyalty in the Context of Multiple Channel Strategies. *Journal of Retailing*, 80(4) 249-263.

Wan, X., Wang, T., Zhang, W., & Cao, J. (2017). Perceived value of online customization experience in China: Concept, measurement, and consequences. *The Journal of High Technology Management Research*, *28*(1), 17-28.

Wang, L., Sun, Y., & Luo, X. (2022). Game affordance, gamer orientation, and in-game purchases: A hedonic–instrumental framework. *Information Systems Journal*, *32*(6), 1097-1125.

Wang, Y., Lo, H.P., Chi, R. & Yang, Y. (2004). An integrated framework for customer value and customer-relationship-management performance: a customer-based perspective from China. *Managing Service Quality*, 14(2/3), 169-82.

Ward, J.C., Ostrom, A.L. (2006). Complaining to the masses: the role of protest framing in customer-created complaint web sites. *Journal of Consumer Research*, 33(2), 220-230.

Webster, F.E. (1994). Defining the new marketing concept. *Marketing Management*, 2(4), 22-31.

Wernerfelt, B. (1984). A Resource-based View of the Firm. *Sloan Management Review*, 5(2), 171-180.

WiBaar, A. (2000). *Fallon helps reinvent Nordstrom's ad strategy*. Adweek Midwest Edition.

Winter, S. (2003). Understanding Dynamic Capabilities. *Strategic Management Journal*, 24, 991-995.

Woodruff, R.B. (1997). Customer value: the next source for competitive advantage. *Journal of the Academy of Marketing Science*, 25(2), 139-53.

Yang, F.; Tang, J.; Men, J.; Zheng, X. (2021). Consumer perceived value and impulse buying behavior on mobile commerce: The moderating effect of social influence. *J. Retail. Consum. Serv, 63*, 102683.

Yang, S.M., Yang, M.H., & Wu, J.B. (2005). The impacts of establishing enterprise information portals on e-business performance. *Industrial Management and Data Systems*, 105(3), 349-368.

Yang, Z. (2001). Consumer perceptions of service quality in Internet-based electronic commerce. *Proceedings of the 30th EMAC Conference*, Bergen.

Zeithaml, V.A. (1988). Consumer perceptions of price, quality, and value: a means-end model and synthesis of evidence. *Journal of Marketing*, 52(3), 2-22.

Zhao, Y., Zhao, X., & Liu, Y. (2022). Exploring the Impact of Online and Offline Channel Advantages on Brand Relationship Performance: The Mediating Role of Consumer Perceived Value. *Behavioral Sciences*, *13*(1), 16 ; https://doi.org/10.3390/bs13010016

Zhu, K., & Kraemer, K.L. (2002). E-Commerce Metrics for Net-Enhanced Organizations: Assessing the Value of e-Commerce to Firm Performance in the Manufacturing Sector. *Information Systems Researc*h, 23(1), 23-41.

Zott, C., & Amit. R. (2009). *The business model as the engine of network-based strategies*. In: The network challenge, ed. P.R. Kleindorfer and Y.J. Wind. Upper Saddle River: Wharton School Publishing.

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Appendix

A: Abbreviations Table

Table 10. The commonly used abbreviations and terms in the paper

Abbreviations	State
CRM	Customer Relationship Management
B2C	Business to Customer
LISREL	Linear Structural Relationships
SEM	Structural equation modeling
EC	Electronic Commerce
SD	Standard Deviation
df	Degree of freedom
Sig	Significance
EFA	Exploratory Factor Analysis
KMO	Kaiser-Meyer-Olkin
BSc	Bachelor of Science
MSc	Master of Science
GFI	Goodness of Fit Index
AGFI	Adjusted Goodness of Fit Index
RMSEA	Root Mean Square Error of Approximation
CFI	Comparative Fit Index
χ^2	Chi-Square

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