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ABOUT WIJAR

Westcliff International Journal of Applied Research (WIJAR) is a multidisciplinary, double-blind peer-reviewed, open access journal pioneered by the faculty at Westcliff University. The journal was founded in 2017 and provides an opportunity for academics, industry professionals, and students to publish innovative research that offers insight into practical implementation. In order to widely disseminate new knowledge and scholarship, WIJAR advocates for all submissions to be written in a style that is accessible/available to a broad audience or readership, including those readers who may not be familiar with either research or the topic studied. The journal aligns with Westcliff University's mission to educate, inspire, and empower individuals through its dedication to supporting authors in the review and revision process to produce the highest quality content possible.

Distinguishing this journal from others similar is the strong support offered to contributors, especially first-time authors who may need additional writing or structural assistance. All contributors have access to the Westcliff University Online Writing Center where dedicated research/writing specialists are able to offer support and suggestions.

LETTER FROM THE EDITOR-IN-CHIEF

January 2024.

Dear Readers,

It is with great pleasure that I bring this issue to the attention of our readers on behalf of the Editorial Board of the *Westcliff International Journal of Applied Research* (WIJAR). We are proud to share the latest research and original perspectives that our writers have found. I hope their work encourages others to share their unique perspectives and sparks further research.

This compilation of seven articles is the second and last group of articles accepted in 2023. I truly believe that the success of this publication is the result of the dedication and hard work of all those concerned, who have collaborated to seek out new information and make a difference. This is a great chance for us to express our gratitude to everyone who has contributed to our journal.

The dedication and energy of the journal contributors inspire me. Members of the editorial board who provide vital support, reviewers who meticulously evaluate each submission, and writers who contribute insightful comments make up a vibrant academic community that propels our publication forward.

In particular, I would like to express my gratitude to Prof. Christa Bixby, former WIJAR Editor-in-Chief, for providing comprehensive guidance and trusting in me and my competence to oversee this research journal. With the same thankful spirit, I would like to sincerely thank Dr. Evelin Suij-Ojeda, Prof. Jodi Crawford and Rachel Sieber, our respected Associate Editors, for their invaluable contributions. Their unwavering commitment to our journal's objective has played a crucial role in molding its course and enhancing its reputation within the academic community. Their remarkable knowledge, thoroughness, and constant support are genuinely priceless contributions to our team.

To conclude, I want to invite everyone who reads this issue — faculty, students, and researchers — to delve into its contents and engage with the thought-provoking ideas it presents. We have no doubt that you will think about submitting your research articles to this journal because it is an excellent resource and proof of the significant influence of scholarly work.

Sincerely,

Mary Allegra
Editor-in-Chief

ACKNOWLEDGEMENTS

The publishing of the *Westcliff International Journal of Applied Research* (WIJAR) relies on the contributions of dedicated individuals. We extend our appreciation on behalf of the journal to:

- Dr. Anthony Lee for his unwavering support and strong belief in the journal's significant value for Westcliff University and the wider academic community.
- Members of the editorial, internal, and external review boards of WIJAR for participating in the review process to assess and choose high-quality research articles.
- Every author who has dedicated their time and energy to presenting their thoughts and perspectives in this publication.
- The Marketing Department of Westcliff University for their overall participation and contributions to the journal's marketing, the development of the journal's website, and for their significant role in the publication's success.
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- Dr. Julie Ciano and Dr. Laura Sliwinski for supporting this project.
- Dr. Jannette Flores and Prof. Christa Bixby, former WIJAR editors-in-chiefs, for their effort and dedication, which have guided the journal's academic path.

Thank you all!

Balancing User Privacy and Legal Demands while Conducting Businesses on the Blockchain

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Abstract

Blockchain technology offers a promising way to improve business processes by providing a secure and transparent transaction platform. However, using this technology brings its own set of challenges, especially when trying to balance user privacy with legal and regulatory needs. This article explores the challenges of keeping user information private, adhering to regulatory frameworks, and fulfilling legal requirements on the blockchain. A key point in this research is the challenge of keeping or maintaining confidentiality while being transparent. The article also discusses the issues of applying legal rules to a system not controlled by one central authority, the risks of privacy and security breaches, and the need to follow data protection laws. The article highlights how some blockchain-based companies have tackled these challenges, mainly through smart blockchain management and innovative technology, by looking at real-world examples from major companies like IBM, Bitpay, Ripple, and Coinbase. The systematic literature review (SLR) methodology involved reviewing literature from the past 15 years (2008-2023) from trusted sources like Google Scholar, ACM Digital Library, IEEE, Springer, and Science Direct. The findings indicate that cutting-edge technologies prioritizing privacy, such as zero-knowledge proofs, ring signatures, and encryption methods, would enable Bitcoin (BTC) platform operations to maintain or balance privacy and transparency. Furthermore, the study indicates the importance of clear privacy guidelines, adhering to relevant regulations, working closely with regulators and law enforcement, and educating users. In summary, it is crucial to approach blockchain carefully, prioritizing user privacy while meeting all legal and regulatory requirements.

Keywords: Blockchain technology, user privacy, legal requirements, data protection, regulations, privacy-focused technologies

Introduction

Blockchain technology (BCT) has been a significant innovation in recent years, notably giving rise to the well-known cryptocurrency, Bitcoin. However, beyond just cryptocurrency, BCT has found its way into various industries, helping many businesses differently. Simply put, BCT is a technology that records transactions securely, clearly, and permanently without a central authority overseeing it (Swan, 2015). Each part of this chain has a unique code linking back to the previous one, creating a secure

record of all transactions (Nakamoto, 2008). This system comprises blocks containing transaction records, and a network of computers protects it. Once a block is added to the chain, it cannot be changed, ensuring the data are safe and accurate.

BCT has changed businesses' operations by combining safety with transaction transparency on a platform system (Swan, 2015). BCT has been used in various areas like managing supply chain (Cole et al., 2019; Gurtu & Johny, 2019), verifying digital identities (Aydar et al., 2019;

Tapscott & Tapscott, 2016; Wolfond, 2017), in finance (Chang et al., 2020; Nakamoto, 2008; Tapscott & Tapscott, 2017; Treleaven et al., 2017), protecting intellectual property (Crosby et al., 2016; Tsai et al., 2017; Wang et al., 2019), and handling smart contracts (Khan et al., 2021).

However, using BCT has challenges (Henry et al., 2018). One of the main issues is balancing user privacy with the need to follow laws and regulations (Damgård et al., 2021; Li et al., 2019). This issue includes the challenge of keeping things private while still being transparent (Damgård et al., 2021; Li et al., 2019), the difficulty of applying legal rules to a system not controlled by one central group (Damgård et al., 2021; Li et al., 2019), risks of privacy and security breaches (Böhme et al., 2015; Zyskind et al., 2015), and the need to follow data protection laws (Finck, 2018; Ibáñez et al., 2018; Kuner et al., 2018). To make the most of BCT in business, it is essential to carefully address these challenges and promote the responsible use of blockchain.

In this research article, our primary objectives are to explore the challenges of maintaining privacy in blockchain systems and to propose recommendations for balancing privacy with legal and regulatory aspects. The study investigates how blockchain technology impacts user privacy, assessing the inherent tensions between the transparent nature of blockchain and the need for privacy. Simultaneously, it aims to offer well-informed recommendations for blockchain management, prioritizing user privacy while complying with legal and regulatory requirements. This investigation involves ascertaining how blockchain systems comply with legal standards, describing the regulatory concerns related to BCT, and exploring the feasibility of integrating privacy technologies in blockchains. Furthermore, using real-world applications, it analyzes best practices and lessons learned from major companies like IBM, Bitpay, Ripple, and Coinbase. The recommendations suggest frameworks or guidelines that could aid stakeholders in navigating the complexities of blockchain technology. The ultimate goal is to contribute to a more comprehensive understanding of the delicate balance between privacy, legal compliance, and regulatory challenges in the blockchain landscape.

Literature Review

This section reviews existing literature from articles obtained from search engines such as Google Scholar ACM Digital Library and journals such as IEEE, Springer, Science Direct, and others to understand better BCT, its impact on user privacy, and the challenges of meeting legal and regulatory requirements.

The literature review starts with an overview of BCT, describing it as a decentralized digital system that securely records transactions without central oversight. The review highlights BCT's use across various sectors and its features like decentralization, transparency, permanent data storage, and strong security, primarily through cryptography.

The review then delves into user privacy concerns, acknowledging the risks such as identity theft and fraud due to BCT's transparency. The review discusses advanced cryptographic solutions like zero-knowledge proofs, ring signatures, homomorphic encryption, and privacy-preserving smart contracts to mitigate these risks. These methods are vital in ensuring data privacy while maintaining the integrity and transparency of blockchain transactions.

Following this, the review addresses legal compliance and regulatory requirements for BCT businesses. It notes the difficulties in applying legal rules to a decentralized system, the tension between BCT privacy features, and the need for regulatory oversight in areas like finance.

The review culminates in discussing the challenges of balancing user privacy with legal demands. It emphasizes the complexity of reconciling the need for businesses to comply with legal data-sharing requirements and the protection of user privacy. The review also points out the repercussions for businesses and users failing to meet these demands, highlighting the need for proactive strategies to navigate these challenges effectively.

Overview of Blockchain Technology

In simple terms, BCT is a digital system that records transactions securely and clearly without a central authority overseeing it (Smith, 2020). It has been used in many areas, from tracking products in a supply chain to managing contracts, because of its ability to improve transparency and efficiency (Gurtu & Johny, 2019; Moosavi et al.,

2021; Swan, 2015). The system comprises blocks containing transaction records and is protected by a network of computers (Nakamoto, 2008). This composition ensures data are safe and cannot be changed (Hofmann et al., 2017; Nakamoto, 2008; Politou et al., 2021). BCT's main features include its decentralized nature, clear transaction records, permanent data storage, and strong security measures (Nakamoto, 2008). The strength of BCT comes from its use of cryptography, which protects information (Kosba et al., 2016b).

User Privacy Concerns

While BCT gives users more control over their data, it also has risks like identity theft and fraud (Khan et al., 2020). BCT's transparency records can sometimes reveal too much information about users (Sudhakaran et al., 2020). To address this, various methods have been developed to protect user privacy. Cryptographic solutions, such as zero-knowledge proof (ZKP) (W. Li et al., 2020; Sun et al., 2021), ring signatures (X. Li et al., 2020; Mercer, 2016), homomorphic encryption (Breuer & Bowen, 2013; Feng et al., 2019) and privacy-preserving smart contracts (Kosba et al., 2016a), have been developed to address these challenges. These solutions are described in the following subsection.

Advanced Cryptographic Techniques

BCT's security comes from advanced methods of protecting data. These methods are crucial for keeping data safe and ensuring transparent and trustworthy transactions. Some of the main methods include:

Ring Signature Technology: Introduced by Rivest, Shamir, and Tauman in 2001, ring signatures offer enhanced anonymity in digital transactions. Unlike traditional digital signatures, identifying the signer, ring signatures allow a group member to sign on behalf of the entire group (X. Li et al., 2020). This technology ensures the signature's validity without revealing the individual signer's identity.

Homomorphic Encryption: This technique allows for computations on encrypted data without prior decryption (Breuer & Bowen, 2013). The encryption ensures that data remains confidential even during processing, making it ideal for operations on untrusted servers or third-party platforms.

Zero-Knowledge Proofs (ZKPs): ZKPs enable one party to provide proof of a statement's validity to another without fully revealing the specifics of that statement (Sun et al., 2021). This arrangement ensures data privacy while confirming its authenticity.

Privacy-Preserving Smart Contracts: These blockchain-based contracts protect sensitive data during execution. They employ cryptographic techniques to ensure data confidentiality while maintaining the integrity of the contract's operations (Kosba et al., 2016a).

After discussing user privacy and the methods to protect it, the following section looks at the legal and regulatory challenges of using BCT.

Legal Compliance and Regulatory Requirements

For businesses using BCT, understanding and following the law is crucial. There are strict rules about protecting user data and other legal requirements (Ibáñez et al., 2018). The decentralized nature of BCT may make it challenging to apply these rules significantly since data on the blockchain cannot be changed (Hofmann et al., 2017; Nakamoto, 2008; Politou et al., 2021). As BCT is used more in areas like finance, it is also essential to follow financial regulations. However, the privacy features of BCT complicate the monitoring and enforcing these rules, leading to the challenges of balancing user privacy while meeting legal compliance and regulatory requirements. These are examined in the next section.

Challenges of Balancing User Privacy and Legal Demands

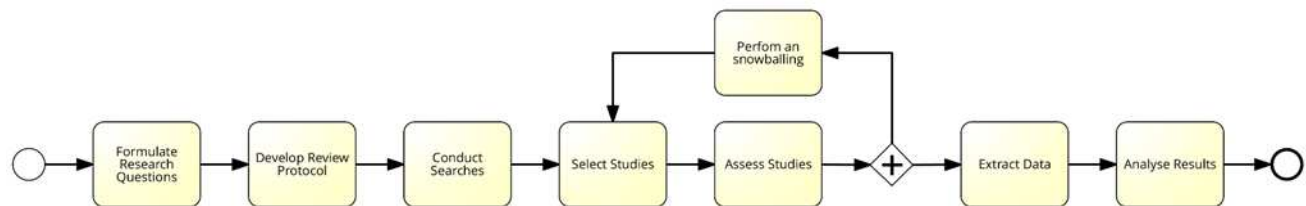
Finding a balance between keeping user data private and meeting legal requirements is complex (Damgård et al., 2021). On the one hand, legal rules might require businesses to share user data, putting user privacy at risk (Damgård et al., 2021; Xue et al., 2019). On the other hand, methods protecting user privacy complicate monitoring and regulations of BCT (Damgård et al., 2021). These challenges can have serious consequences. For businesses, not following the rules can lead to fines, legal problems, and damage to their reputation (Damgård et al., 2021; Martens et al., 2017). For users, it can mean risks to their privacy and personal data (Zyskind et al., 2015).

Understanding these challenges is just the beginning. To address them, businesses must be proactive, use strategies protecting user privacy, and meet legal requirements. The following sections will explore these strategies and give examples of their use.

Research Methodology

The research methodology employed was the systematic literature review (SLR) approach as proposed in Kitchenham (2004) and Kitchenham and Charters (2007), the phases of which are shown in Figure 1.

Figure 1
Phases of the Systematic Literature Review



Note: Source (Kitchenham, 2004)

The SLR was meticulously designed to investigate the complexities of BCT, its influence on user privacy, and the associated legal and regulatory challenges. Literature selection, guided by criteria such as publication date (2008-2023), source credibility from search engines and databases like Google Scholar, ACM Digital Library, IEEE, springer, and Science Direct, relevance to the critical themes of BCT, and methodological robustness, was achieved through a combination of keyword searches and manual screening. The analysis phase encompassed thematic analysis to identify critical patterns within the data, comparative analysis to contrast different perspectives and findings, and a synthesis of these findings to understand privacy challenges and legal compliance in BCT comprehensively. This analysis was complemented by a critical evaluation to identify strengths, weaknesses, and gaps in the current research landscape, ensuring a thorough and balanced examination of the topic.

Identification of the Investigation

The article explores the challenges of balancing user privacy with the need to follow laws and regulations. The following are the research questions:

Q1: What are the challenges of maintaining privacy on blockchain systems?

Q2: How can blockchain systems comply with legal standards?

Q3: What are the regulatory concerns related to BCT?

Q4: What is the feasibility of integrating privacy-preserving technologies in blockchains?

Q5: What are the real-world applications and case studies of BCT?

Q6: What are the recommendations for balancing privacy legal and regulatory aspects of blockchain?

Firstly, it involves investigating how blockchain technology impacts user privacy and assessing the inherent tensions between the transparent nature of blockchain and the need for privacy. Secondly, it analyzes the compliance with legal standards in blockchain applications by examining legal frameworks and standards for BCT and how blockchain systems can comply with these legal standards, particularly in different jurisdictions. Thirdly, it identifies key regulatory concerns related to BCT. Fourthly, it investigates the integration of privacy-preserving technologies in blockchains. Fifthly, it assesses real-world applications and case studies, and lastly, it proposes recommendations for balancing privacy and legal and regulatory aspects.

Development of the Review Protocol

The remainder of the procedure, including the subsequent steps, involved defining the databases for searches and setting the criteria for including or excluding articles that would be part of the study. The criteria for inclusion in this study mandated that the reviewed articles include

specific keywords such as blockchain technology, user privacy, legal requirements, data protection, regulations, and privacy-focused technologies. Additionally, the reviewed articles needed titles and abstracts relevant to the study's scope and written in English. The articles were excluded if they were duplicates, were not available for download, were written in a language other than English, or if their title and abstract did not align with the study's focus.

Conduct Searches

The study utilized multiple search engines to gather bibliographic references and academic articles. Search terms included "blockchain," "blockchain technology," "user privacy," "legal requirements," "data protection," "regulations," and "privacy-focused technologies." It specifically excluded terms like "Bitcoin" and "Cryptocurrency." The research focused on publications from 2008 onwards, a timeframe chosen due to its relevance to the release of Nakamoto's Bitcoin paper in 2008 (Nakamoto, 2008). This period also covers the adoption of the EU General Data Protection Regulation (GDPR) on April 14, 2016, with its enforcement deadline set for May 25, 2018. The study

investigated the difficulties in maintaining user privacy while adhering to legal and regulatory requirements in blockchain operations.

Early searches revealed a surge in blockchain technology-related publications starting in 2008. The research used various search engines and databases, including Google Scholar (<http://scholar.google.com>), ACM Digital Library (<http://dl.acm.org>), Springer (<http://link.springer.com>), IEEE Xplore Digital Library (<http://ieeexplore.ieee.org>), and Science Direct (<http://www.sciencedirect.com>). The search criteria were built around keywords such as "blockchain," "blockchain technology," "user privacy," "legal requirements," "data protection," "regulations," and "privacy-focused technologies." The Boolean operator AND was utilized to ensure the inclusion of all these terms. Additionally, terms like bitcoin and cryptocurrencies were excluded to narrow the focus away from the vast array of publications on these topics. The search was limited to English-language publications from 2008 to 2023. The search strings varied depending on the database, creating a specific set of strings for each, as detailed in Table 1.

Table 1
Search Strings in Scientific Databases

Database	Search String
Google Scholar	Blockchain technology user privacy legal requirements data protection regulations privacy-focused technologies -bitcoin cryptocurrency [interval 2008–2020]
ACM Digital Library	[All: blockchain technology] AND [All: user privacy] AND [All: legal requirements] AND [All: regulations] AND [All: privacy-focused technologies] AND [All: not bitcoin] AND [All: not cryptocurrency] AND [Publication Date: (01/01/2008 TO *)]
Springer	Blockchain technology AND user privacy AND legal requirements AND data protection AND regulations AND privacy-focused technologies AND NOT (bitcoin) AND NOT (cryptocurrency) within 2008–2023
IEEE Xplore Digital Library	(((((Blockchain technology) AND user privacy) AND legal requirements) AND data protection) AND regulations) AND privacy-focused technologies) NOT bitcoin) NOT cryptocurrency Filters Applied: 2016–2020
Science Direct	Blockchain technology user privacy legal requirements data protection regulations privacy-focused technologies -bitcoin -cryptocurrency Years: 2008–2023

Selection of Publications

Publications closely related to the search keywords were identified as potentially relevant. One hundred twenty publications were initially chosen for inclusion in the systematic review. The initial step involved summarizing the

publishers of the journals and conference papers from which these publications were derived, as presented in Table 2. This demographic information helped determine the forums where researchers publish their scientific literature, guiding future publications.

Table 2

Relevant Journals and Publishers

Relevant Journals	Publishers
IEEE Access	IEEE
arXiv preprint	arXiv
Interactive Technology and Smart Education	Emerald Publishing
Pervasive and Mobile Computing	Elsevier
Journal of Economic Perspectives	American Economic Association
Engineering Secure Software and Systems	Springer
Proceedings of the International Conference.	ACM Digital Library
Technological Forecasting and Social Change	Elsevier
Supply Chain Management: An International Journal	Emerald Publishing
Topics in Cryptology – CT-RSA	Springer
International Journal of Advance Research, Ideas...	IJARI
Proceedings of the ACM SIGSAC Conference ...	ACM Digital Library
Journal of Network and Computer Applications	Elsevier
International Journal of Physical Distribution...	Emerald Publishing
IEEE Transactions on Emerging Topics in Computing	IEEE
Marine Policy	Elsevier
IEEE Access	IEEE
Procedia Computer Science	Elsevier
Peer-to-Peer Networking and Applications	Springer
IEEE Network	IEEE
Data	MDPI
Environmental Science and Pollution Research	Springer
Accounting, Auditing & Accountability Journal	Emerald Publishing
IEEE Network	IEEE
Harvard Business Review	Harvard Business Publishing
Penguin	Penguin Books
Computer	IEEE Computer Society
Procedia Computer Science	Elsevier
Technology Innovation Management Review	Carleton University
IEEE Transactions on Industrial Informatics	IEEE
Computers & Security	Elsevier
Portland International Conference on Management...	IEEE
IEEE Security and Privacy Workshops	IEEE

Following the completion of the searches, 120 publications were found to align with the established search criteria. Only those available for complete access and analysis were retained, while inaccessible ones were excluded. The subsequent phase involved a detailed review of each publication, focusing on the title, keywords, and abstract to assess their relevance to the study's core areas, including blockchain technology, user privacy, legal requirements, data protection, and privacy-focused technologies. The selection process was then narrowed down to include publications that addressed the six questions posed by this study, offering insights into the challenges of balancing user privacy with legal requirements. Ultimately, 62 published publications since 2008 were chosen for detailed information extraction.

Assess Studies

Simultaneously with the data extraction, the quality of the primary studies was assessed. This evaluation was based on their contextual relevance, the significance of the information provided, and its pertinence to our study's focus, as outlined by Kitchenham and Charters (2007). Through this process, one could qualify and validate each study based on the extracted data, which was used as a benchmark for determining whether to accept or reject a publication.

Performing Snowballing

The snowballing phase represents a method in systematic literature research described by Kitchenham (2004), which involves leveraging the references and citations of a document to uncover further relevant documents. This approach made it feasible to identify and incorporate additional articles pertinent to the

study. This phase enhanced the understanding and explanation of the study's subject matter.

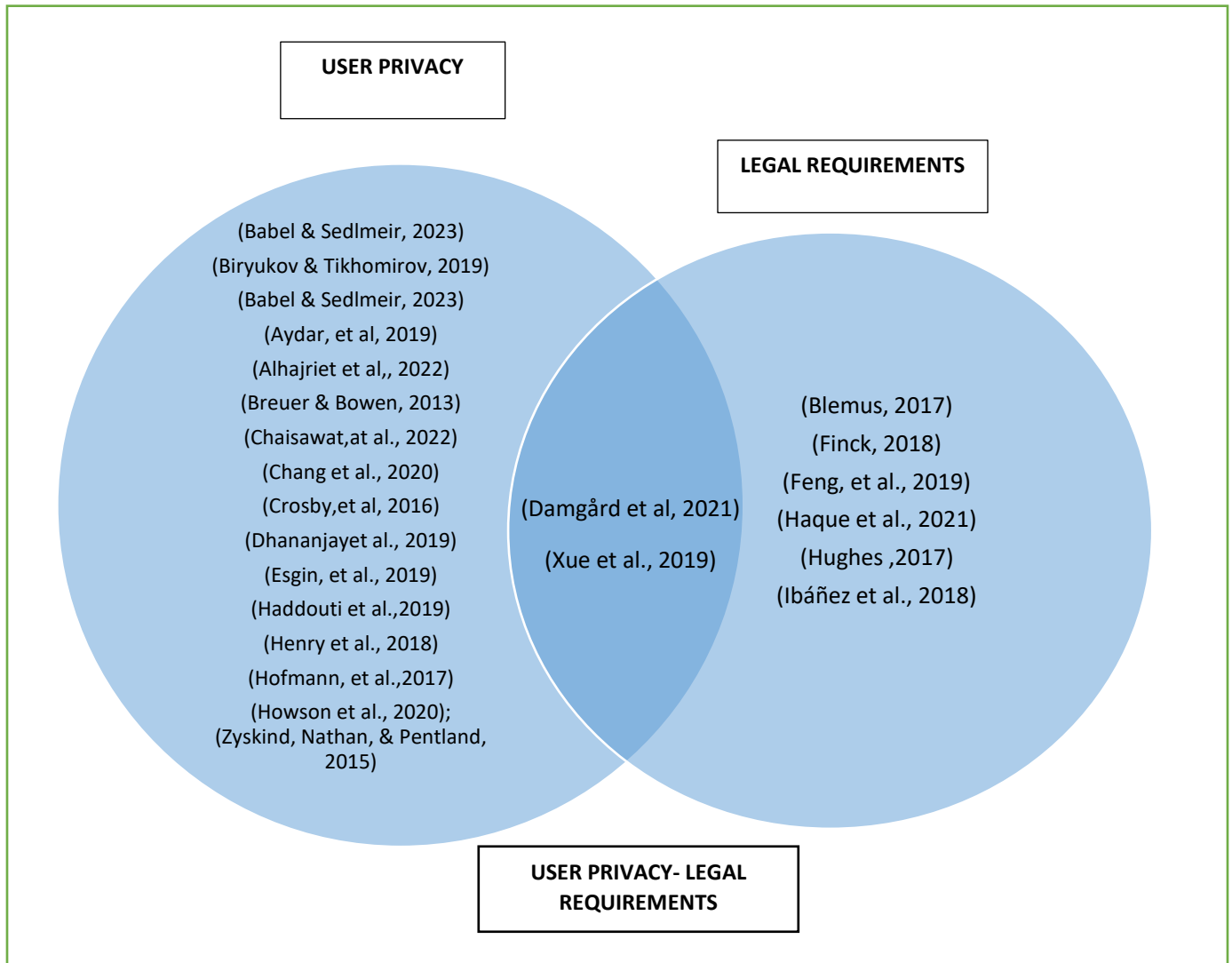
Data Extraction and Synthesis

Each article was reviewed, both the abstract and the complete text, extracting the information related to the possibilities it offers for challenges of maintaining privacy on blockchain, how blockchain systems comply with legal standards, the regulatory concerns related to BCT, the feasibility of integrating privacy-preserving technologies in blockchains, the real-world applications and case studies of BCT, and recommendations for balancing user privacy and legal requirements on blockchains.

While analyzing the extracted information, the focus was on user privacy and legal requirement issues. On the one hand, it was necessary to examine issues such as compliance of blockchain systems with legal standards and the examination of the regulator concerns related to BCT. Furthermore, the feasibility of integrating privacy-preserving technologies in blockchain and real-world applications and case studies of BCT had to be examined.

The whole process of data extraction was designed to answer the initial questions that were proposed (Q1–Q6) at the beginning of the investigation. As shown in Figure 2's Venn diagram, few studies were identified as highlighting a relationship between user privacy and legal requirements or accountability (Damgård et al., 2021; Xue et al., 2019). However, many studies focused solely on user privacy, not legal requirements, while some addressed solely legal requirements. Not many studies selected for data extraction addressed user privacy and legal requirements and found an intrinsic relationship between the two terms.

Figure 2
Relationship between the Terms Analyzed in Different Studies



Results and Findings

Once the literature selected for the extraction of information had been reviewed, the six questions were answered at the beginning of this article.

Analysis of Results on Issues Raised

Q1: What are the Challenges of Maintaining Privacy on Blockchain Systems?

Many challenges to maintaining privacy on blockchain systems were identified in the literature. A significant concern identified is the

tension between the inherent transparency of BCT and the need for user privacy. Studies highlighted the risks of identity theft and data exposure due to the public nature of blockchain ledgers. Finding a balance between keeping user data private and meeting legal requirements is complex (Damgård et al., 2021). Legal rules might require businesses to share user data, which can put user privacy at risk (Damgård et al., 2021; Xue et al., 2019).

However, methods that protect user privacy can make it hard for authorities to monitor and regulate BCT (Damgård et al., 2021). These challenges can have serious consequences. For businesses, not following the rules can lead to fines, legal problems, and damage to their reputation (Damgård et al., 2021; Martens et al., 2017). For users, it can mean risks to their privacy and personal data (Zyskind et al., 2015). Understanding these challenges is just the beginning. To address them, businesses must be proactive and use strategies that protect user privacy and meet legal requirements.

Q2: How can Blockchain Systems Comply with Legal Standards?

For businesses using BCT, understanding and following the law is crucial. There are strict rules about protecting user data and other legal requirements (Ibáñez et al., 2018). The decentralized nature of BCT can make it hard to apply these rules, significantly since data on the blockchain cannot be changed (Hofmann et al., 2017; Nakamoto, 2008; Politou et al., 2021). As BCT is used more in areas like finance, it is also essential to follow financial regulations. However, the privacy features of BCT can make it difficult to monitor and enforce these rules, leading to the challenges of balancing user privacy while meeting legal compliance and regulatory requirements.

Q3: What are the Regulatory Concerns Related to BCT?

The decentralized nature of BCT poses unique regulatory challenges. The literature pointed to the difficulty in applying traditional legal frameworks to decentralized systems, emphasizing the need for new regulatory approaches. The consensus was that regulatory bodies must evolve to accommodate BCT's distinct characteristics, balancing innovation with user protection.

For businesses using BCT, understanding and following the law is crucial. There are strict rules about protecting user data and other legal requirements (Ibáñez et al., 2018). The decentralized nature of BCT may make it challenging to apply these rules, significantly since data on the blockchain cannot be changed (Hofmann et al., 2017; Nakamoto, 2008; Politou et al., 2021). As BCT is used more in areas like

finance, it is also essential to follow financial regulations. However, the privacy features of BCT may make it challenging to monitor and enforce these rules, leading to the challenges of balancing the use of privacy while meeting legal compliance and regulatory requirements.

Q4: What is the Feasibility of Integrating Privacy-Preserving Technologies in Blockchains?

Advanced cryptographic techniques emerged as a prominent theme, focusing on their role in addressing privacy and security concerns. Innovations in homomorphic encryption and privacy-preserving smart contracts were identified as key developments, offering new ways to protect data within the blockchain environment.

Advanced Cryptographic Techniques

BCT's security comes from advanced methods that protect data. These methods are crucial for keeping data safe and ensuring transparent and trustworthy transactions. Some of the main methods include:

- **Ring Signature Technology:** Introduced by Rivest, Shamir, and Tauman in 2001, ring signatures offer enhanced anonymity in digital transactions. Unlike traditional digital signatures, which identify the signer, ring signatures allow a group member to sign on behalf of the entire group (X. Li et al., 2020). This technology ensures the signature's validity without revealing the individual signer's identity.
- **Homomorphic Encryption:** This technique allows for computations on encrypted data without prior decryption (Breuer & Bowen, 2013). It ensures data remains confidential even during processing, making it ideal for operations on untrusted servers or third-party platforms.
- **Zero-Knowledge Proofs (ZKPs):** ZKPs enable one party to provide proof of a statement's validity to another without fully revealing the specifics of that statement (Sun et al., 2021). This arrangement ensures data privacy while confirming its authenticity.

- **Privacy-Preserving Smart Contracts:** These blockchain-based contracts protect sensitive data during execution. They employ cryptographic techniques to ensure data confidentiality while maintaining the integrity of the contract's operations (Kosba et al., 2016a).

Q5: What are the Real-World Applications and Case Studies of BCT?

Real-world examples of how companies continue to use the strategies described earlier in the previous section can be given by considering case studies involving four companies. These comprise IBM (n.d), Ripple (n.d), Bitpay (n.d), and Coinbase (n.d).

IBM

IBM (n.d) has developed a blockchain-based solution for supply chain management called IBM Food Trust (Nguyen & Do, 2018), designed to increase transparency and traceability in the food supply chain (Howson, 2020; Kawaguchi, 2019). To balance user privacy and legal demands, IBM (n.d), working with Walmart (Sristy, 2021), has implemented privacy-preserving technologies such as ZKPs and smart contracts to ensure that user data are protected while allowing for legal compliance (W. Li et al., 2020).

Ripple

Ripple (n.d) is a blockchain-based cross-border payment and remittance platform (Jani, 2018). To balance user privacy and legal demands, Ripple has complied with and implemented a comprehensive program that includes anti-money laundering (AML) and know-your-customer (KYC) measures and partnerships with regulators and law enforcement agencies to ensure that legal demands are appropriately addressed (Rosner & Kang, 2015; Sater, 2020).

BitPay

Bitpay (n.d) is a blockchain-based platform that allows merchants to accept cryptocurrency payments (Biryukov & Tikhomirov, 2019). It allows one to buy, store, swap, and spend cryptocurrency all in one app (Bitpay, n.d). To balance user privacy and legal demands, BitPay has implemented a comprehensive privacy policy (Biryukov & Tikhomirov, 2019) that outlines how user data is collected, used, and protected, as

well as partnerships with regulators and law enforcement agencies to ensure legal compliance.

Coinbase

Coinbase (n.d) is a centralized cryptocurrency exchange platform allowing users to buy, sell, and trade cryptocurrencies. To balance user privacy and legal demands, Coinbase has complied and implemented a comprehensive compliance program that includes AML and KYC measures and partnerships with regulators and law enforcement agencies to ensure compliance (Hughes, 2017).

Q6: What are the Recommendations for Balancing User Privacy and Legal Requirements on Blockchain?

While the blockchain's inherent complexities present many challenges, its transformative potential cannot be overlooked. As analyzed in these articles, the equilibrium between user privacy and legal compliance is delicate and paramount. Nevertheless, recognizing these challenges is only the beginning. Actionable steps must be taken to harness BCT's transformative power while safeguarding user interests and meeting legal mandates. Thus, based on the authors' comprehensive analysis, the following are the recommendations to guide businesses and policymakers in this evolving landscape.

Develop Clear Privacy Policies

Businesses should develop clear and comprehensive privacy policies that outline how they collect, use, and protect user data on the blockchain. These policies should be transparent and easy to comprehend and should clearly explain how the organization balances the need for user privacy with legal compliance.

Implement Privacy-Preserving Technologies

Businesses can implement privacy-preserving technologies such as ZKPs and homomorphic encryption for user protection while allowing for legal compliance. These technologies can help to ensure the protection of sensitive user data while still allowing organizations to comply with legal demands.

Follow Relevant Regulatory Frameworks

To comply with relevant legal requirements, businesses should follow regulatory frameworks such as the European Union's GDPR or the United States Bank Secrecy Act (BSA). This recommendation can help to ensure that user data is protected and that legal demands are appropriately addressed.

Work with Regulators and Law Enforcement

Businesses and policymakers should work closely with regulators and law enforcement agencies to develop strategies and approaches that balance user privacy and legal compliance on the blockchain. This recommendation can help ensure that legal demands are appropriately addressed while protecting user privacy.

Educate Users

Businesses should educate users about the importance of user privacy on the blockchain and how to protect their data. This recommendation can include providing users with clear information about their privacy rights, how to exercise them, and providing guidance on protecting their data using privacy-preserving technologies.

Emerging Trends

The review identified several emerging trends. One notable trend is the increasing use of BCT for identity management, addressing privacy and regulatory compliance. Another is the development of blockchain governance models that aim to bridge the gap between decentralization and regulatory needs.

Discussion

Interpretation of Findings

The results underscore the intrinsic conflict between the transparency of blockchain technology (BCT) and the necessity of user privacy. As revealed by the findings, this tension raises significant concerns such as identity theft and data exposure, particularly given the public nature of blockchain ledgers. The challenge lies in harmonizing the dual objectives of preserving user privacy and fulfilling legal obligations. Businesses risk legal repercussions and reputational damage for non-compliance, while users confront potential privacy infringements.

The research points to the complexity of this balance, highlighting the need for proactive

strategies that adequately address both privacy concerns and legal requirements. The gaps identified in the literature, particularly in regulatory adaptation and the implementation of privacy-enhancing technologies, highlight areas for future research and development. These insights are crucial for practitioners and policymakers as they navigate the rapidly evolving landscape of BCT.

Implications

For businesses, these findings suggest a pressing need to develop blockchain systems that are not only technologically advanced but also legally compliant and user-centric in terms of privacy. The practical implications are vast, from adopting advanced cryptographic techniques like homomorphic encryption and zero-knowledge proofs to implementing privacy-preserving smart contracts. These technologies could be pivotal in safeguarding user data while adhering to legal mandates.

Theoretically, these findings contribute to the ongoing discourse on privacy and legal compliance in the blockchain. They suggest reevaluating traditional legal frameworks to accommodate BCT's decentralized and immutable nature better. This balance could lead to the development of new regulatory approaches that balance innovation with user protection.

Limitations of Study

This research is not without limitations. The evolving nature of blockchain technology and its regulatory environment means that the findings may have a limited shelf-life, necessitating continuous reevaluation. Additionally, the study primarily focused on the technical aspects of privacy and compliance, potentially overlooking broader socio-economic factors that also play a critical role in adopting and regulating BCT. Finally, the findings are derived from existing literature, which may not fully capture the rapidly evolving nature of blockchain applications in diverse contexts.

While the study sheds light on the crucial balance between user privacy and legal requirements in the blockchain space, it also underscores the need for ongoing research and adaptation to evolving technological and regulatory landscapes. Businesses and regulators must work in tandem to foster an

environment where innovation thrives without compromising user privacy or legal compliance.

Conclusion

The exploration into balancing user privacy with legal demands in BCT surfaces a complex and multifaceted landscape. The key findings illuminate the inherent tension between the need for transparency in blockchain systems and the imperative of user privacy. Significant risks like identity theft and data exposure arise from the public nature of blockchain ledgers. Simultaneously, legal compliance poses challenges, often at odds with privacy concerns. Businesses are caught in a delicate balancing act, where non-compliance can result in legal ramifications and reputational damage, while overly stringent privacy measures could hinder legal oversight and regulation. Incorporating advanced cryptographic techniques and privacy-preserving smart contracts has emerged as a pivotal theme, offering potential solutions to these challenges.

Future Research

Looking ahead, one of the avenues for future research to emerge is to investigate how legal frameworks can evolve to better accommodate the unique characteristics of blockchain technology, especially in areas like data immutability and decentralized governance.

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Management Information Systems and Correlation Between E-Business and Information Security from a Business Intelligence Perspective

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Abstract

The research focus was motivated by the emergence of electronic business which increased during and after the COVID-19 pandemic. The research is a literature review and its purpose is to build awareness about the importance of information security and to analyze the correlation between information security and electronic business in an environment where electronic business is emerging and the gap between electronic business and information security is enlarging. The research is a review of peer-reviewed articles retrieved from case studies, empirical research, case analysis, literature reviews, comparative studies, systematic reviews, and conceptual analysis dating from the years of 2018 to 2023. This literature review defines four business intelligence concepts: management information systems, value driven business, electronic business, and information security. This literature review also reveals the effects of all four business intelligence concepts on organizations' decision-making and financial objectives. Findings of this literature review revealed that electronic businesses need a stronger risk management approach regarding information security. The conclusion shows that the current technological approach and information security tools such as encryption key management, mantraps, and network intrusion detection systems do not ensure trust and/or eliminate digital security risks.

Keywords: Information security, electronic business, management information systems, value driven business, business intelligence

Introduction

The proliferation of coronavirus disease, also referred to as COVID-19, led governments to put in place the indispensable safety measures that would prevent the spread of the virus. The safety measures include prolonged lockdown, quarantine, and isolation (Shah et al., 2020). The

impact of the pandemic on people's lifestyle as well as the restrictions of internal movement and international travel pressured brick and mortar businesses to convert into electronic businesses (Bhatti et al., 2020). Electronic business is emerging and the gap between electronic business and information security is enlarging.

The purpose of this literature review is to build awareness about the importance of information security and to analyze the correlation between information security and electronic business. Criteria used to analyze the literature includes accuracy, objectivity, currency, and coverage (City University of Hong Kong, 2023).

Accuracy is ensured through peer-reviewed articles and objectivity is maintained through unbiased information. As for the currency, it is confirmed by the recent dates of publications which do not exceed 5 years. The last criteria used to analyze the literature is coverage which evaluates whether the collected information provides a basic coverage or an in-depth coverage that meets the purpose of the literature review. This literature review is thematic as it is organized by content; it defines four business intelligence concepts: management information systems, value driven business, electronic business, and information security and it also reveals the effects of all four business intelligence concepts on organizations' decision-making and financial objectives.

Discussion

It is crucial for organizations to generate profit; thus, managers exploit the available tools that can help their organizations to survive, sustain, and be more profitable. In the context of business intelligence, the available tools include management information systems, value driven business, electronic business, and information security (Baltzan, 2019).

Management Information Systems

Management information system is abbreviated as MIS. It is a computer-based tool that combines organizations' processes and information technology. MIS facilitates storing, visualizing, monitoring, and analyzing information within organizations. MIS makes the organizations' decision-making process simple and efficient (Ali, 2019).

Internet Computer Network System Versus Transmission Control Protocol/Internet Protocol Based System

Toyota standardized its system to benefit more from information available in Japan and overseas. The standardization process consisted of shifting Toyota's internet computer (IC)

network system to a transmission control protocol/internet protocol (TCP/IP) based system ("*Information Systems*", n.d). An IC protocol is a blockchain that runs on nodes enabling decentralized applications to run at web speed while a TCP/IP is a set of communication protocols that allow interconnection between network devices on the internet (Kassab & Darabkh, 2020).

Toyota learned an important lesson from the impact that the world crisis had on its information division in 2008 and improved the efficiency of its system. Toyota's pressure-response to the 2008 crisis included establishment of structural reform of the organization's system development and maintenance. In 2009, the organization implemented new information processing technologies and continued to adapt to the industry's changes simultaneously ("*Information Systems*", n.d). Changes that occurred within the automotive industry include the appearance of new electronic technologies and compliance with the adjusted global standards (Llopis-Albert et al., 2021). Toyota maximizes its profit by implementing management information systems while other organizations maximize their profit by converting their businesses into value driven businesses.

Value Driven Business

Value Driven Business is abbreviated as VDB. It is a concept that promotes healthy work environments where employees feel valued. The concept also suggests that the organization's core values must always be reflected in the organization's culture. VDB places the purpose of its strategy beyond generating profit and does not compromise its core values during decision-making processes (Nagle et al., 2019). Value driven businesses draw ethical employees who appreciate being valued and recognized by the organization, thus, organizations that converted their businesses into value driven businesses, experienced improvement in terms of employee commitment and brand reputation. The alignment of the organization's employees with the set values not only sustains growth but also builds customers' trust. Customers who appreciate the brands that reflect core values in the organization's culture, are also drawn to value driven businesses (Enholm et al., 2022).

Example of a Value Driven Business

Starbucks is a value driven business. The brand prioritizes human connections and builds communities in its coffee shops. The brand's core values are all reflected in its culture. As an organization, Starbucks mirrors the community vibe even when presenting financial results and expansion possibilities (Musonera, 2021). Some value driven businesses settle for an offline presence to boost their brick-and-mortar experience while other businesses build an online presence to adapt to the current changes in business trends. In the context of business intelligence, changes include but are not limited to the emergence of electronic business which increased during and after the COVID-19 pandemic.

Electronic Business

Electronic business is abbreviated as e-business. It signifies that the organization's operations are based online through the internet, world wide web, intranets, and extranets. Contrary to e-commerce, e-business does not only consist of selling and purchasing products and services online, but it also involves many processes, such as supply chain management, enterprise resource planning, online customer support, and electronic ordering (Zebari et al., 2019). Organizations' preference for e-business processes has been increasing along with COVID-19 restrictions (Bhatti et al., 2020) and the increase of the cyber security actions that encouraged online transactions (Xu & Gao, 2021).

E-business resulted in streamlining organizational processes, operations, and communication. Moreover, e-business decreased transaction costs in the supply chain. Retailing evolved because of the emergence of e-business which led to the possibility of targeting larger segments, automating sales, simplifying digital deliveries, tracking information, and reaching optimization (Zhu et al., 2020).

Cloud Computing Platforms and Technology Infrastructures

Amazon is one of the largest cloud computing platforms in the world. Amazon is an online marketplace that has established itself effectively through continuous innovation and mass scale (Jelassi et al, 2020). Unlike small organizations

that cannot afford powerful information technology (IT) infrastructures that enable adoption of artificial intelligence (AI), Amazon and Google invested in computing power infrastructure to enable AI algorithms, machine learning in the cloud, and rich data sets (Enholm et al., 2022). Amazon is not only involved in e-business but also in e-commerce which exposes its information to higher security risks.

Information Security

Information is one of the most sensitive assets within organizations. Information is expected to be protected against unauthorized access or use, e.g., malware, identity theft, and phishing attacks. Information security, which is abbreviated as InfoSec, plays the role of a protector; it constitutes a set of physical and digital tools that organizations create or put in place to prevent, identify, record, and limit the risks related to any unauthorized access to digital and non-digital information (Deb & Roy, 2022).

Information Security Tools

Information security tools include encryption key management, mantraps, and network intrusion detection systems. With information security, information is expected to be protected during its four stages: formatting, transition, processing, and storing. Information security aligns with the CIA triad which represents confidentiality, integrity, and availability. Information security is susceptible to be audited to verify its efficacy (Sintaro & Komolafe, 2021).

Correlation Between E-Business and Information Security

Electronic businesses are most likely to be attacked through hacking, sniffing, masquerading, spoofing, and wiretaps. Electronic businesses perceive Denial of Service, also called DoS attacks, as the most dangerous digital menaces. DoS attacks lock information and prevent the organization from accessing its data. The data may not be destroyed, yet the fact of maliciously locking it, results in financial losses. Being unable to provide existing customers with the appropriate services at the time of the attack does not only result in financial loss but it also negatively affects customers' trust. Customers' trust is of higher value and repairing a brand's negative image is time consuming and costly. For

this reason, electronic business relies on information security to address concerns about data integrity loss, data privacy, service, and control depletion (Alghamdi et al., 2020).

Information Security Threats in E-Business

Online threats against e-business include hacking, data breach, e-skimming, online payment fraud, cross-site scripting, phishing, malware, and distributed denial of service.

Hacking and Data Breach

Hacks and data breaches indicate that a computer or a private network is being exploited without authorized access. Hacking is an intentional security violation while data breach is an unintentional security incident. Data breach is caused by non-malicious behavior such as human error and negligence. Whenever sensitive data is left in an insecure environment, a security vulnerability is created; any person without authorized access may view, copy, transmit, steal, edit or use the data. The data could comprise confidential personal information or corporate information. Confidential personal information consists of social security numbers, bank accounts, and healthcare reports. Corporate information consists of customer records, intellectual property, and financial materials (Sharma et al., 2020).

E-skimming and Online Payment Fraud

E-skimming indicates that customers' information is being captured by cyber-criminals as it is being entered in the online check out page of an e-commerce website. Whether cyber-criminals rely on cross-site scripting, phishing, brute force attack, or a third-party compromise, they end up gaining access to the e-commerce website. As soon as cyber-criminals get into the system, they introduce malicious skimming codes. Malicious skimming codes redirect online shoppers to spoofed websites and unlock theft of bank card information in real time (Andreianu, 2023). Making online payments with stolen bank card information is called online payment fraud (Balasubramanian & Rajakani, 2019).

Cross-Site Scripting

Cross-site scripting (XSS) indicates that a hacker relies on web applications to inject malicious codes in web pages. According to

Cisco's annual security report, 40% of the cyber-attack attempts are due to cross-site scripting. Customers who visit e-commerce websites that are injected with malicious codes, automatically infect their devices, and expose themselves to cyber-attacks such as phishing and malware. XSS attacks often occur in unprotected online forums, message boards, and blogs (Rodríguez et al., 2020).

Phishing

Phishing indicates that a hacker is posing as a legitimate business to deceive customers. Phishing occurs often in e-commerce when hackers pretend to be part of the e-commerce business and send emails to customers emphasizing on urgency and requiring customers' immediate action. The objective of phishing is to deceive customers into exposing their private or confidential information (Gupta et al., 2021).

Malware

Malware is a malicious software that infects devices such as computers, tablets, and mobile phones. The objective of malwares is to redirect users to alternative websites, restrict access to a specific system, steal money, and get a hold of credentials or personal identifiable information (PII). In the case of a ransomware attack which is a type of malware, cyber-criminals encrypt the data of the e-commerce business via malware and demand a ransom payment in exchange of the decryption key (Kim et al., 2018; Xiao et al., 2020).

Distributed Denial of Service

Distributed denial of service (DDoS) indicates that a cyber-criminal is flooding a server with an excessive number of requests to overload the system (Sahoo et al., 2019). DDoS attacks are coordinated by one machine via botnets which are a network of malware-infected devices (Pan et al., 2021). The objective of DDoS attacks is solely to disrupt a business (Anshari et al., 2022). E-commerce businesses that face DDoS attacks, experience operational disruption and suffer significant financial losses that could potentially result in a complete shutdown (Dahiya & Gupta, 2020).

Importance of Information Security in E-Business

According to Cisco's annual security report of 2018, each online application has a minimum of one vulnerability (Rodríguez et al., 2020). In 2018, the success rate of cyber-attacks against e-commerce businesses was 32.4% (Badotra & Sundas, 2021). The number of attacks continued to rise every year. Malware variants had doubled in number between the years of 2016 and 2017 to reach a total of 670,000,000 malware variants in 2017 (Xiao et al., 2020). In 2019, approximately 15.1 billion data entries were breached (*"More than 15.1 billion records exposed"*, 2020). This indicates that cyber-criminals often target customers' personal data; a concern that became a severe issue in e-commerce (Kim et al., 2018).

Organizations are required to protect their servers, networks, endpoints, and databases. To fulfill this requirement, organizations, notably, e-commerce businesses must invest in robust information security to fix all vulnerabilities before a cyber-criminal launches an online attack, e.g., malware, data breach, hacking, online payment fraud, e-skimming, cross-site scripting, phishing, and distributed denial of service.

As the number of data breach grows, the need for cyber security in e-commerce becomes unavoidable not only to protect customers' confidential data but also to protect the entire organization and its stakeholders. With the rapid evolution of e-commerce, there is an improvement in online transactions and an increase in payment card information collected from customers at online check out. Data on payment card information attracts malicious actors with bad intentions.

Since customers do not wish their information to be compromised, whether it is financial or personally identifiable information such as names, addresses, contact details, and birthdates, customers always avoid electronic business platforms that are known for a history of cyber-attacks or for a reputation of weak cyber-security protocols. Investing in robust information security is the key to ensure that customers remain confident in e-commerce. Otherwise, e-commerce businesses can expect a damage in the perception that customers have for e-business. E-commerce businesses can also expect a shift in consumer behavior and a lack of advocacy or engagement with online brands. The

economic impact of data breach is costly in terms of reputation and money-wise. This includes the cost of both data breach and lost business (Liu et al., 2022).

Prevention of Digital Threats in E-business

E-commerce websites prevent digital threats through secure sockets layer certificates, multi-factor authentication, secure payments, firewalls or anti-malware, hardware and software updates, third-party risk management, cyber-security training, access control, and network segmentation.

Secure Sockets Layer Certificates

Hypertext transfer protocol secure (HTTPS), is a set of cryptographic network protocols that encrypts and verifies communication between a server and a web browser (Shah & Correia, 2021). HTTPS hosting is sometimes referred to as secure sockets layer (SSL) or transport layer security (TLS). Implementation of HTTPS hosting requires a secure sockets layer certificate. The SSL certificate is a digital certificate that binds a cryptographic key to the organization's details allowing encrypted connections (Dastres & Soori, 2020).

Multi-Factor Authentication

Multi-factor authentication (MFA) requires users to provide a minimum of two authentication methods to confirm their identity before accessing their online accounts. Besides a username and a complex password that must be changed periodically, the MFA which is also referred to as two-factor authentication, requires a one-time PIN, a valid response to a security question, identity verification through a mobile application, and/or a biometric scan (Ibrokhimov et al., 2019).

MFA may seem time-consuming, yet it is more secure than a single password and less time-consuming than mitigation against a successful data breach. E-businesses make sure that their stakeholders use MFA and encourage their customers to provide a minimum of two authentication methods to confirm their identity before accessing their online accounts (Ibrokhimov et al., 2019).

Secure Payments

E-businesses secure payments by redirecting customers to a third-party website at

check-out. PayPal and Stripe are third-party websites that manage payment transactions independently, keeping customers' credit card details out of the e-business website (Karthick, 2019).

Firewalls, Anti-Malware, Antivirus

Anti-malware, antivirus, and firewalls are software that detect and delete viruses and other malicious software from the system. Anti-Malware, antivirus, and firewalls provide a baseline defense against external threats (Deepak & Varun, 2019). The latest device protection systems combine artificial intelligence and machine-learning (ML) (Al-Tarawneh & Bani-Salameh, 2023).

A firewall is one of the network security measures that helps to record users' activities and prevent data alteration as well as other fraudulent transactions. Firewalls also prevent confidential information from leaving the network without the e-business knowledge. E-businesses always update their firewalls to allow proper traffic control and restriction of data transmission (Deepak & Varun, 2019; Taherdoost, 2023).

Hardware and Software Update

Software updates fix bugs, improve performance, enhance features, and address security vulnerabilities. Most software updates are mainly developed for security purposes. Unpatched hardware or software are not equipped with the latest vital security patches to defend against the most recent digital threats, leaving the opportunity to cyber-criminals to exploit the organization's vulnerabilities (Mugarza et al., 2020).

Third-Party Risk Management

E-businesses' cloud service providers, partners, and suppliers are all part of the supply chain and must be protected from cyber-attacks. Third parties constitute potential weaknesses that must be managed by the e-business, especially if the functionality of the e-business relies tremendously on the third-party. Third-party management includes monitoring, understanding, and remediating risks which could be challenging, especially if hundreds of providers, partners, and suppliers are involved (Radu et al., 2020).

Cyber-security Awareness and Training

Non-malicious behavior such as human error and negligence are the primary cause of data breach. Hence, the importance of cyber-security awareness and training. E-businesses build awareness and authentic engagement through cyber-security strategies. For instance, a cyber-security strategy could indicate that dissemination of the cyber-security culture would start at the C-suite level, filtered down throughout the organization through internal campaigns, consistent cyber-security updates, simulations, and drills. In addition to building cyber-security awareness, e-businesses schedule adequate cyber-security training for employees. Cyber-security training differs based on the exposure risk of each employee or team (Alahmari et al., 2023).

Access Control and Network Segmentation

Access control designates the stakeholders who can access sensitive information and resources. Access control systems reduce the attack surface by designating and controlling the number of stakeholders who can access certain personal data (Neykova & Miltchev, 2019). Network segmentation keeps confidential data separated from the rest of the existing information in the network. In network segmentation, confidential data is firewalled and always monitored (Mhaskar et al., 2021).

Impact of Information Security on E-Business

Information security protects customers' information and prevents online threats against organizations. Information security allows online shoppers to enjoy their shopping experience, make safe financial transactions, and build trust in electronic business platforms. The stronger information security is, the more a brand upholds its reputation and protects itself from fraud and cyber-attacks (Kala, 2023). Based on Juniper Research (2021), e-businesses are expected to lose 206 billion U.S. dollars in online payment frauds between the years of 2021 and 2025. This amount demonstrates why information security must be a top priority in e-business.

Information security indicates that adequate measures are in place to mitigate the risk of facing information security threats (Hrishev, 2020). Thus, saving e-businesses' time, energy, reputation, and assets including cash and

inventory. For instance, multi-factor authentication verifies and confirms the identity of both e-business employees and customers through a mobile application, and/or a biometric scan (Ibrokhimov et al., 2019), saving e-businesses' time and energy spent in traditional verification methods. Secure payments via third-party websites keeps customers' credit card details out of the e-business's website. Should a data leak occur, all payment transactions would not be found in the e-business database (Karthick, 2019), saving the e-business from reputational damage.

Network segmentation prevents lateral movements between stakeholders and cyber-criminals (Jha, 2023) while access control systems limit the pathways that could be taken by cyber-criminals to access the e-business system (Kedah, 2023). Network segmentation results in a decrease in the risk of data breach and/or contamination via malware from other parts of the network (Jha, 2023) while access control systems allow the e-business to easily determine the source of data breach and/or contain malicious software (Kedah, 2023).

HTTPS provides another layer of connection security that encrypts transferred data. Encryption of transferred data protects e-businesses and challenges hackers who have the intention to read, intercept, or transfer data without authorization (Shah & Correia, 2021). Anti-malware, ant-virus, and particularly firewalls help to record users' activities on e-business websites and prevent data alteration as well as other fraudulent transactions. Firewalls also prevent confidential information from leaving the network without the e-business knowledge

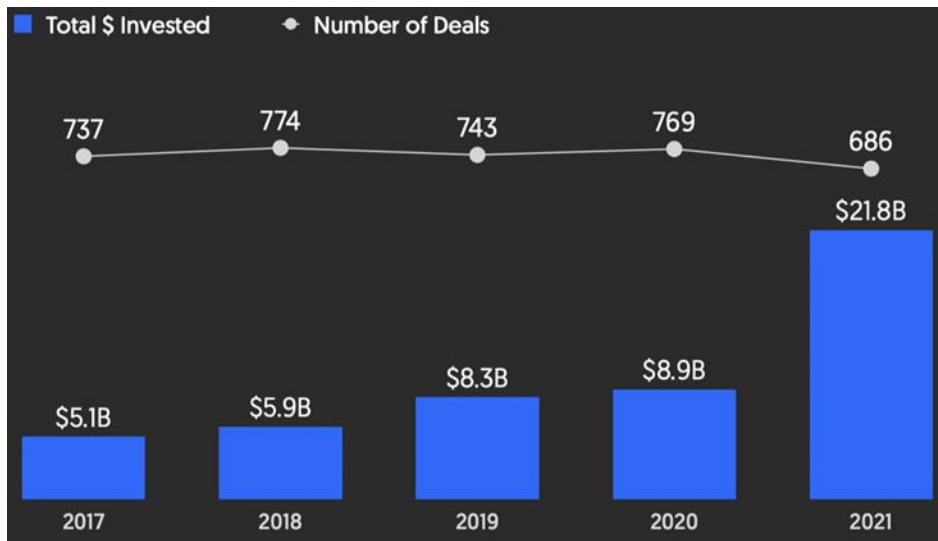
(Deepak & Varun, 2019; Taherdoost, 2023). Hardware and software updates provide the latest vital security patches to defend e-businesses against the most recent digital threats, reducing the vulnerabilities that could be exploited by cyber-criminals (Mugarza et al., 2020).

Cyber-security awareness and training reduce the cost associated with human error and negligence which are the primary cause of data breach in e-business. A mature cyber-security culture shapes employees who are capable of detecting, reporting, and remediating suspicious activities within the e-business (Alahmari et al., 2023). Finally, third-party risk management protects the entire supply chain which includes the externality of the e-business, e.g., partners, suppliers, and distributors. Third-party risk management ensures continuous flow of operations, allows maintenance of a healthy inventory, and eliminates the cost of disruption (Radu et al., 2020). Yet, although solutions such as Up Guard Vendor Risk exist, third-party risk management is challenging especially if hundreds of partners, suppliers, and distributors are involved (West & Zentner, 2019).

Protection Against Information Security Threats is Never at 100%

Governments are creating cyber-security laws and policies (Luo & Choi, 2022) while e-commerce businesses invest more money to address cyber-security concerns (Vinoth et al., 2022). Figure 1 shows that yearly investment in cyber-security increased between the years of 2017 and 2021 (Metinko, 2022).

Figure 1
Yearly Investment in Cyber-Security



Note. Adapted from Cybersecurity venture funding surpasses \$20B in 2021, fourth quarter smashes record, by C. Metinko, 2022 (<https://news.crunchbase.com/news/cybersecurity-venture-funding-2021-record/>). In the public domain

Figure 2 shows that quarterly investment in cyber-security increased between the last quarters of 2020 and 2021. Conspicuously, there was a sudden increase in cyber-security investments between the third and fourth quarters

of 2021; a remarkable jump from 4.8 billion to 7.8 billion U.S. dollars, respectively, implying that cyber-security concerns are worsening (Metinko, 2022).

Figure 2
Quarterly Investment in Cyber-Security



Note. Adapted from Cybersecurity venture funding surpasses \$20B in 2021, fourth quarter smashes record, by C. Metinko, 2022 (<https://news.crunchbase.com/news/cybersecurity-venture-funding-2021-record/>). In the public domain.

According to the conceptual analysis of social engineering, denial of services, malware, and attacks on personal data, cyber risks can be reduced but not eliminated (Liu et al., 2022). In the loop of never-ending cyber security risks, there are cyber-criminals constantly searching for vulnerabilities and new online users joining e-commerce. New online users, whether e-business owners or customers, are generally more vulnerable compared to old users and are more likely to be detected and attacked by hackers and attackers (Liu et al., 2022).

E-business cannot be protected from information security threats at 100% despite utilizing standard authentication techniques combined with SSL/TLS certificates and multi-factor authentication. Technology is developing and the volume of information security solutions is rising, yet hackers' intelligence is rising too (Gull et al., 2022). Any data being collected is at risk of being compromised regardless of the e-commerce security precautions in place. What matters the most in this unsafe environment is how proactive and well-prepared is the e-business to manage potential cyber risks (Liu et al., 2022). Preparedness comprises implementation of data backups and formulation of incident response plans (Fitri et al., 2023; Kavitha & Ramajayam, 2021).

Data Backups

Cyber incidents interrupt business operations while back-up systems enable immediate restoration of data and a fast recovery of business operations after cyber incidents (Fitri et al., 2023). Data must be continuously backed-up. In case of a cyber incident occurring, all data must be up to date to keep the business functional during the attack. Backed-up data must be stored in a second network, outside the primary network, e.g., secure cloud storage. Should a cyber incident occur, only the primary network would be breached or contaminated while the second network containing the back-up would remain secure (Fitri et al., 2023). Restoration of relevant data in a cyber crisis is an effective cyber incident response that diminishes the impact of data breaches on business operations (Fitri et al., 2023).

Incident Response Plan

Incident response plans state the existing information security policy (ISP) as well as the roles, responsibilities, and contact details of the parties that will be involved in the cyber incident response, if it ever occurs. Incident response plans are constantly checked for accuracy of policy, roles, responsibilities, and contact details of the parties involved (Kavitha & Ramajayam, 2021). Incident response plans clearly formulate the steps that should be followed in a cyber crisis and explain how stakeholders should coordinate what happens after the cyber incident (Kavitha & Ramajayam, 2021).

Management of a cyber crisis is an effective cyber incident response that not only saves the organization's reputation, but also time and resources that could be wasted on unsuccessful attempts to solve sudden cyber-attacks without preparation (Kavitha & Ramajayam, 2021).

Business Intelligence from a Multilateral Point of View

Business intelligence (BI) is characterized by its speed, efficiency, and accuracy. Although no model was created for the analysis of the effects of business intelligence on organizations' decision-making, business intelligence is perceived as an automatic system that helps organizations to make informed strategic decisions that perfectly align with the business's major objectives (Tavera Romero, 2021). A significant number of models were created for the implementation of business intelligence. However, no model was created for the analysis of the effects of business intelligence on organizations' decision-making. Therefore, some suspect that business intelligence may not have any effects on the organization's decision-making. The environment dynamic as well as the pressures and/or other external factors, such as, the threats and opportunities may affect the organization's decision-making (Aghaei & Asadollahi, 2013; Tavera Romero, 2021).

Recommendations

Recommendations for Practice

Findings of this literature review indicates that a risk management approach must be implemented, but prior to implementing a risk management approach, each industry should set the standard needs and determine the best

information security tools for its operations. A certification authority should be provided to organizations, notably, e-businesses that comply with and respond to the selected information security criteria. The best information security tools and certification can then be converted into fundamental information security standards for electronic businesses in each industry.

Recommendations for Future Research

Based on the findings of this literature review, a significant number of models were created for the implementation of business intelligence. However, no model was created for the analysis of the effects of business intelligence on organizations' decision-making. Future quantitative research studies with the purpose of accepting or denying the hypothesis of BI having a direct impact on organization's decision-making would build upon the findings of this literature review. Other qualitative research studies with the purpose of revealing the exact impact of BI on organization's decision-making, if any, would also help to fill the gap in the literature.

Conclusion

The purpose of this literature review was to build awareness about the importance of information security and to analyze the correlation between information security and electronic business in an environment where electronic business is emerging and the gap between electronic business and information security is enlarging. Information security threats such as malware variants doubled in number from 2016 to 2017 and approximately 15.1 billion data entries were breached in 2019. As the number of data breaches continues to rise every year at a high success rate, the need for information security in e-commerce becomes unavoidable. Organizations, notably, e-commerce businesses must invest in robust cyber-security solutions to fix all vulnerabilities and protect servers, networks, endpoints, and databases. Adoption of AI based cyber-security requires powerful IT infrastructures that can support extremely large amounts of computing power. Successful e-businesses invest in powerful IT infrastructures to run or complete complex algorithms, process large data sets, and/or perform machine learning. Nonetheless, e-businesses still cannot operate with confidence

because they are most likely to be attacked through hacking, sniffing, masquerading, spoofing, and wiretaps. Network security measures such as firewalls and anti-malware, provide real-time threat detection and obstruct cyber-criminals' attempts to perform fraudulent transactions. Access control, network segmentation, and cryptographic network protocols are additional layers of connection security in e-business. Yet, despite investment in network and connection security, the challenge of the cyber-security landscape is worsening. Cyber-criminals are gaining practical experience and acquiring profound knowledge in cyber-attacks. Regardless of how much e-business implements cyber security protocols or training and how much sophisticated technology is used to conduct day-to-day activities, the challenge of cyber-security threats is still present and cyber-attacks are still sudden. E-businesses' existence is threatened by the increasing number of cyber-security attacks, notably, DoS which is perceived as the most dangerous digital menace. Findings of this literature review revealed that there is a need for a strong risk management approach in the field of information security because the current technological approach and information security tools such as encryption key management, mantraps, and network intrusion detection systems do not ensure trust and/or eliminate security risks.

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Exploring the Gender Dimension in Entrepreneurship Development: A Systematic Literature Review in the Context of Bangladesh

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Abstract

This systematic literature review explores the nuanced gender dimension in Bangladesh's entrepreneurship development. Employing a meticulous research methodology, including a comprehensive search strategy, data extraction, thematic analysis, and ethical considerations, the review synthesizes academic literature to unveil challenges faced by women entrepreneurs. The findings reveal formidable obstacles, such as restricted access to formal financial resources due to gender biases, societal norms reinforcing traditional roles, a lack of tailored training, and barriers to networking and mentorship. Government initiatives, including Women Entrepreneur Development Associations, reserved quotas, and microcredit programs, aim to address these challenges and promote gender-inclusive entrepreneurship. Women-led enterprises significantly contribute to job creation, local economic growth, and income redistribution. Beyond economic impact, women's entrepreneurship enhances decision-making power, challenging traditional gender norms and fostering equity. The review emphasizes the need for targeted policies, improved access to capital and skills development, and awareness campaigns. Recommendations include eliminating gender-based financial discrimination, developing comprehensive training, expanding mentorship, and highlighting the broader economic impact. Public awareness campaigns challenging stereotypes are vital for a supportive environment. Future research should explore policy effectiveness, technology's role, experiences of marginalized communities, and long-term impacts. Addressing these areas with evidence-based policies can create an enabling environment where women entrepreneurs thrive, contributing to a more inclusive, equitable, and prosperous society. This review serves as a valuable resource for policymakers, researchers, and stakeholders committed to advancing gender-inclusive entrepreneurship in Bangladesh and beyond.

Keywords: Gender, entrepreneurship, Bangladesh, women entrepreneurs, gender disparities, economic impact

Introduction

The concept of entrepreneurship is widely recognized on a global scale for its contribution to economic growth, job generation, and the promotion of innovation (Toma et al., 2014). It involves the identification and development of new business prospects. The concept encompasses the integration of novel ideas, venturesome behavior, and effective allocation of resources, so fostering the emergence of fresh commodities, services, and sectors, ultimately bolstering the economic growth and welfare of nations. In the specific setting of Bangladesh, a country characterized by a diverse cultural legacy and a historical trajectory defined by tenacity and advancement, the phenomenon of entrepreneurship has arisen as a powerful driver of transformation and growth (Kohsaka & Rogel, 2021). In recent decades, the nation of Bangladesh, with a population over 160 million individuals, has seen a notable period of economic expansion (Emon et al., 2023). Throughout this transformative trajectory, the phenomenon of entrepreneurship has emerged as a pivotal factor contributing to this progress. The existing literature lacks significant exploration of the nexus of gender and entrepreneurship, as well as the problems and opportunities that women entrepreneurs in Bangladesh encounter, despite its considerable significance (de Groot et al., 2017). The socio-cultural environment of Bangladesh is characterized by a multifaceted composition of various cultures, religions, and economic disparities (Hasan et al., 2022). The nation in question is characterized by its own identity, which was established through the attainment of independence from Pakistan in 1971 following an extended conflict for liberation. Subsequently, Bangladesh has initiated a course of economic advancement distinguished by its tenacity, determination, and progress. Bangladesh, as the eighth-most populous country globally, exhibits a significant abundance of potential (Halder & Stiglitz, 2016). Nevertheless, a fundamental characteristic of Bangladeshi society is the presence of strongly entrenched traditional gender roles and norms, which have traditionally served as the foundation of its social structure (Tariq & Syed, 2018). These societal norms establish the expectations and obligations assigned to individuals based on their gender, exerting influence over multiple domains such as education, employment, and business. Although the evolution of these

norms has occurred over a period, their impact remains significant, especially in the realm of entrepreneurship. It is worth noting that Bangladesh continues to face challenges in addressing gender imbalances in several aspects of life (Pfefferman et al., 2022). The aforementioned discrepancies persist within the realm of entrepreneurship, wherein female entrepreneurs encounter specific obstacles such as restricted availability of financial resources, conformity to conventional gender norms, and a scarcity of possibilities for training and skill enhancement (Cacciotti et al., 2016). The aforementioned issues have significant significance for the entrepreneurial experiences of women, and their responses need a comprehensive comprehension of the intricate nature of these barriers (Kaniy et al., 2023). The primary objective of this systematic literature analysis is to shed light on the gender dimension within the entrepreneurial landscape of Bangladesh. The review aims to uncover the complex interaction between gender, entrepreneurship, and the wider socio-economic backdrop, as discussed by Thirumalesh (Thirumalesh Madanaguli et al., 2021). Through this endeavor, the aim is to enhance the overall comprehension of the obstacles and prospects that influence the encounters of female entrepreneurs in Bangladesh. The main aims of this systematic literature review are to examine and consolidate the current body of research on the topic of gender and entrepreneurship in Bangladesh (Chowdhury et al., 2018). The objective of this study is to synthesize the knowledge, discoveries, and viewpoints presented in prior research in order to construct a thorough summary of the subject area. In addition, the study aims to recognize and analyze the primary obstacles encountered by female entrepreneurs in Bangladesh, acknowledging the need of a comprehensive comprehension for effective solutions. This analysis aims to analyze the policies and activities implemented by various entities, including governments, NGOs, and other stakeholders, in order to foster gender-inclusive entrepreneurship in Bangladesh (Corrado & Corrado, 2017). Evaluating the efficacy of these therapies and their tangible effects is of utmost importance. This research examines the economic consequences associated with women's involvement in entrepreneurship. It highlights that firms managed by women have the capacity to not only foster economic expansion but also enhance societal welfare

(Sharr, 2023). This research delves into the various dimensions of social empowerment resulting from women's entrepreneurial pursuits, acknowledging that entrepreneurship has the potential to act as a catalyst for wider societal transformation. This study undertakes a systematic literature analysis to examine the complex association between gender and entrepreneurship within the dynamic and diverse setting of Bangladesh (Liu et al., 2018). The objective of this initiative is to reveal the narratives of women entrepreneurs that have not been previously acknowledged, highlighting their ability to persevere and make significant achievements. Additionally, it seeks to provide strategies and opportunities that can lead to a future characterized by inclusivity and prosperity for all individuals (Bansal et al., 2019). In conclusion, the review possesses the capacity to provide valuable insights for policy formulation and the development of strategies, as well as to enhance the agency of women entrepreneurs. Moreover, it has the ability to make a significant contribution to the existing body of research on the subject of gender and entrepreneurship in Bangladesh.

Gender and Entrepreneurship: A Global Perspective

A detailed analysis from a worldwide standpoint is needed in order to comprehend the gender aspect within the realm of entrepreneurship. The involvement of women in entrepreneurship has experienced significant growth globally, as there is a growing acknowledgment of their significant contributions to several aspects of economic progress (Rosca et al., 2020). The acknowledgement of this phenomenon arises from an expanding corpus of scholarly study that illuminates the substantial impact exerted by women entrepreneurs in terms of job generation, economic advancement, and innovative endeavors (Kuschel et al., 2020). Numerous studies undertaken in various countries constantly emphasize the significant contributions made by enterprises managed by women in terms of generating employment opportunities and their correlation with economic resilience (Alam et al., 2022). The aforementioned data highlight the significant contribution made by women entrepreneurs in influencing the economic environment. These firms play a crucial role in generating employment possibilities, hence making significant contributions to both local and global economies. Furthermore, it has been shown in

scholarly research that there exists a correlation between women's entrepreneurship and economic stability. This correlation is attributed to the fact that enterprises owned by women tend to have a remarkable level of resilience when confronted with economic fluctuations, as evidenced by the findings of Dewitt (Dewitt et al., 2023). Nevertheless, in the midst of their noteworthy accomplishments, female entrepreneurs face a variety of distinct problems that have the ability to impede their advancement and restrict their entrepreneurial capabilities. The problems faced by entrepreneurs cover a range of characteristics, such as limited access to financial resources, restricted networking possibilities, and the impact of societal expectations on their entrepreneurial decisions and strategies (Kamberidou, 2020). One of the primary obstacles encountered by women entrepreneurs on a global scale pertains to the restricted availability of financial resources. Historically, financial institutions have exhibited a lesser inclination to provide credit to firms controlled by women, generally considering them as borrowers with higher risk (Hewa Wellalage et al., 2020). The limited availability of capital can impede the progress and long-term viability of firms managed by women, constraining their capacity to allocate resources towards innovation, expansion, and the development of human capital (Dutta & Banerjee, 2018). Networking has a crucial role in fostering entrepreneurial success. Nonetheless, female entrepreneurs may face obstacles when it comes to accessing essential networks that are crucial for the growth and advancement of their businesses (Ribeiro et al., 2021). These obstacles may materialize in the form of being excluded from business networks that are predominantly male-dominated or experiencing a dearth of representation in associations related to the industry. The restricted availability of networking opportunities might impede the capacity of women entrepreneurs to engage with mentors, investors, and collaborative partnerships that are crucial for the progress and development of their businesses. The actions and strategies of women entrepreneurs are frequently influenced by societal norms and expectations (Bullough et al., 2022). The selection of enterprises and industries by women might be influenced by traditional gender roles and prejudices. These societal expectations may incentivize women to choose business initiatives that are seen as more aligned with traditional gender roles,

which could possibly restrict their options and opportunities as entrepreneurs. In order to effectively tackle these issues and fully harness the capabilities of women entrepreneurs worldwide, it is imperative to adopt policies and establish support systems that are specifically tailored to foster a conducive atmosphere for their success (Nziku & Henry, 2020). The policies should be designed with the objective of addressing the obstacles that hinder women's ability to get financial resources, promoting chances for networking, and questioning the conventional gender norms prevalent in the entrepreneurial sphere. It is imperative for policymakers and financial institutions to adopt proactive measures aimed at enhancing the accessibility of funding for women entrepreneurs. According to (Sudarmo et al., 2023), the implementation of various strategies, such as the utilization of specific loan programs, the establishment of venture capital funds that prioritize women-led firms, and the provision of financial literacy programs, can effectively address the existing disparity in financing. According to (Ozkazanc-Pan & Clark Muntean, 2018), the implementation of initiatives aimed at facilitating networking and mentorship opportunities for women entrepreneurs can play a crucial role in enhancing their chances of achieving success. The facilitation of useful contacts and guidance can be achieved through the establishment of mentorship programs, the creation of women-focused business networks, and the promotion of women's presence in industry groups. The task of confronting society expectations and gender standards is a multifaceted and essential undertaking. According to Ennis, (2019), the implementation of educational initiatives and awareness campaigns that aim to challenge preconceptions and advocate for alternative entrepreneurial paths can effectively empower women, enabling them to explore a broader spectrum of business prospects. It is crucial to note that these interventions should be tailored to the individual situation, taking into consideration the distinct obstacles and advantages encountered by women entrepreneurs in various nations and areas. Gaining insight into the worldwide patterns and obstacles in women's entrepreneurship provides a crucial basis for analyzing the unique circumstances of Bangladesh, an environment distinguished by its particular socio-cultural and economic attributes.

Gender and Entrepreneurship in Bangladesh

Bangladesh, due to its peculiar socio-cultural and economic attributes, presents an exceptional and captivating subject for the examination of gender and entrepreneurship. Throughout history, women in Bangladesh have actively participated in diverse economic endeavors, making substantial contributions to the country's economic structure (Schuler et al., 2013). These roles encompass a wide range of sectors, such as agriculture, handicrafts, and microenterprises, and they exemplify the tenacity and ingenuity of women in the nation. The establishment of microfinance organizations, such as Grameen Bank, created by Nobel laureate Muhammad Yunus, was a significant milestone in the advancement of women's business in Bangladesh (Mia et al., 2019). These establishments have had a significant impact on enhancing women's opportunities to get financial resources and enabling them to participate in activities that generate money. Microfinance has facilitated the economic empowerment and improvement of the socio-economic position of women by granting them small loans, typically without the need for collateral, thereby enabling them to launch and develop their entrepreneurial pursuits. Notwithstanding the aforementioned historical precedents and accomplishments, there remain notable obstacles that endure within the business environment for women in Bangladesh (Roy et al., 2020). These difficulties are complex and include multiple dimensions. The persistence of gender biases, whether overt or subtle, significantly impacts women's ability to obtain formal financial services and resources. There is a tendency for financial institutions to display hesitancy in providing loans to firms run by women, so propagating the stereotype that women are borrowers with a higher level of risk (Jaim, 2022). As a result, female entrepreneurs may encounter obstacles when attempting to obtain sufficient funding for the initiation or expansion of their enterprises. The mitigation of these prejudices is of utmost importance in establishing an equitable environment for women in the field of entrepreneurship. The prevailing societal expectations and cultural norms in Bangladesh frequently impose conventional gender roles, so constraining the potential for women to participate in entrepreneurial endeavors outside the informal sector (Emon & Khan, 2023; Lata et al., 2021). These societal expectations may serve as a

catalyst for women to engage in entrepreneurial activities that align with established gender norms, so limiting their options and opportunities for commercial enterprises. It is imperative to address and challenge these deeply entrenched societal norms in order to foster a more varied and inclusive environment within the realm of entrepreneurship. Although microfinance has really played a crucial role in enhancing women entrepreneurs' access to capital, there still a requirement for the implementation of complete support systems (Leitch et al., 2018). Women entrepreneurs necessitate both financial resources and training and skill development opportunities that are customized to address their unique requirements. These programs have the capacity to provide women with the requisite knowledge and skills essential for the effective management and expansion of their enterprises. The presence of gender discrepancies and the obstacles encountered by women entrepreneurs in Bangladesh emphasize the significant need for a comprehensive analysis of entrepreneurship laws and programs that are designed to foster gender equality within the entrepreneurial ecosystem. Policies should not solely focus on addressing financial inclusion but should also aim to overcome deeply ingrained gender biases and enable women to pursue a broader spectrum of entrepreneurial opportunities. Furthermore, it is imperative to make concerted endeavors in order to offer comprehensive assistance that encompasses both monetary and non-monetary dimensions, with the aim of guaranteeing the triumph and durability of firms managed by women in Bangladesh. The study of gender and entrepreneurship in Bangladesh is particularly interesting due to the country's distinctive socio-cultural and economic circumstances, as well as its historical involvement in women's entrepreneurship and microfinance. Although there have been notable advancements in the entrepreneurial endeavors of women in Bangladesh, there remain ongoing obstacles that require comprehensive and tailored governmental interventions to promote a fairer and more inclusive entrepreneurial environment for women.

Policies and Initiatives

The Government of Bangladesh has demonstrated an acknowledgment of the significant significance of promoting gender-inclusive entrepreneurship. Consequently, they

have implemented various policies and initiatives with the objective of providing assistance and empowerment to women entrepreneurs (Khan et al., 2023). A noteworthy endeavor involves the formation of Women Entrepreneur Development Associations (WEDAs) in different geographical areas within the nation (Dionysopoulou & Aivaliotou, 2021). These organizations function as forums for female entrepreneurs, offering avenues for networking, exchange of expertise, and access to key resources. The primary objective of WEDAs is to establish a nurturing environment that fosters the growth and development of women entrepreneurs, thereby equipping them with the necessary tools to surmount various obstacles they encounter, such as the scarcity of networking prospects (Singh & Awasthy, 2023). The implementation of reserved quotas for women entrepreneurs in several sectors, such as the textile and garment industries, has been initiated by the government (Whitfield et al., 2020). The purpose of these quotas is to facilitate the inclusion of women in industries that have historically been predominantly occupied by males. The government's objective is to promote gender diversity and economic development among women in industries that have traditionally been less accessible by giving a fraction of business opportunities to women entrepreneurs. Microcredit programs, such as those pioneered by institutions like Grameen Bank, have significantly contributed to the provision of financial services for women entrepreneurs, particularly those residing in rural regions. These programs provide women with the opportunity to obtain small loans, typically without requiring collateral, which allows them to launch and extend their entrepreneurial endeavors. The utilization of microcredit has played a pivotal role in facilitating the economic empowerment of women, enabling them to allocate resources towards their entrepreneurial endeavors, as well as the betterment of their households and localities. The aforementioned regulations and initiatives demonstrate notable progress in fostering gender-inclusive entrepreneurship in Bangladesh. However, it is imperative to conduct a full evaluation in order to gauge their efficacy and tangible outcomes in practice. There are several crucial dimensions that necessitate investigation: A rigorous assessment of the effects of implementing designated quotas for women entrepreneurs is necessary. This evaluation should encompass an examination of the degree to which these

quotas have resulted in heightened female involvement in sectors that were previously predominantly male-dominated. It is crucial to assess the effectiveness of these policies in order to determine if they have resulted in concrete economic advantages for women entrepreneurs. Microcredit initiatives have played a pivotal role in facilitating the broadening of financial opportunities for female entrepreneurs. It is imperative to conduct an analysis of the extent and efficacy of these initiatives in order to ascertain their ability to effectively reach the designated recipients, particularly in rural regions where the promotion of financial inclusion can significantly contribute to the advancement of women's economic empowerment. The primary objective of Women Entrepreneur Development Associations (WEDAs) is to enhance the empowerment of women entrepreneurs via the provision of comprehensive support and a wide range of resources. Evaluating the degree to which WEDAs have facilitated networking, information dissemination, and resource accessibility is crucial for comprehending their influence on the entrepreneurial environment. It is imperative to conduct a thorough examination of these policies and efforts, as it serves the purpose of comprehending the policy framework in Bangladesh and guaranteeing their congruence with the challenges encountered by women entrepreneurs. Insights obtained from these assessments can be utilized by policymakers, development practitioners, and researchers to enhance and fortify these activities, thereby cultivating a more inclusive and supportive milieu for women entrepreneurs in Bangladesh.

Economic Impact and Social Empowerment

The examination at hand places significant emphasis on the diverse contributions of women entrepreneurs to both the local economy and society as a whole, highlighting the crucial aspect of the economic impact of women-led firms in Bangladesh. Numerous studies have consistently indicated that the engagement of women in entrepreneurial activities in Bangladesh yields significant and wide-ranging benefits for the country's overall growth. The emergence of women-led firms in Bangladesh has proven to be a substantial catalyst for local economy. (Jayne et al., 2014) highlights the significant role played by these contributions in the development of employment, particularly in countries with a sizable and rapidly expanding labor force.

These firms facilitate the creation of employment opportunities, consequently improving the economic well-being of individuals and households. Additionally, it has been observed that female entrepreneurs frequently allocate their income towards the welfare and education of their families, thereby making a significant contribution to the advancement of society (Melissa et al., 2015). The allocation of resources towards educational endeavors possesses the capacity to disrupt the intergenerational transmission of poverty and foster social advancement for forthcoming cohorts. In addition to their economic achievements, the involvement of women in entrepreneurship yields wider social empowerment outcomes. According to (Kato & Kratzer, 2013), the involvement of women in entrepreneurial endeavors has the potential to enhance their decision-making authority both at the home and community levels. The phenomenon of empowerment extends beyond the realm of economic activity, as it actively challenges conventional gender conventions and strives to foster a society that is characterized by greater equity. As women entrepreneurs take on leadership positions and make substantial contributions to their communities, they emerge as exemplars and catalysts for transformation, motivating other women and girls to actively follow their ambitions. Gaining insight into the economic and social aspects of women's entrepreneurship in Bangladesh is crucial in order to comprehend the comprehensive effects of women entrepreneurs and to develop policy measures that can effectively augment their contributions. Enterprises that are run by women frequently demonstrate a notable level of economic sustainability. The sustainability of the organization can be ascribed to a multitude of aspects, encompassing the meticulous administration of resources and a resolute dedication to the welfare of employees and communities. As these firms flourish, they not only contribute to their own expansion but also enhance the resilience and stability of the local economy. The involvement of women in entrepreneurial activities in Bangladesh presents a significant departure from conventional gender roles, as highlighted by (Uddin, 2021). Women entrepreneurs, via their defiance of preconceptions and pursuit of varied business pathways, assume the role as catalysts for societal transformation. Their efforts serve as catalysts for transformative changes in public attitudes towards the roles

and capacities of women, thereby cultivating a society that is more inclusive and characterized by more equity. By acknowledging the interdependence between economic and social consequences, policymakers and development practitioners in Bangladesh have the opportunity to utilize these observations in order to enhance and fortify current policies and efforts. Promoting the expansion of firms managed by women not only serves as a catalyst for economic advancement, but also fosters societal empowerment and advances the cause of gender equality. Policymakers ought to take into account a range of complete assistance measures, including financial accessibility, training opportunities, and mentorship programs, in order to effectively empower women entrepreneurs.

Discussion

The development of a robust search strategy is fundamental to ensuring the credibility and reliability of a systematic literature review. The search method employed in this research was carefully crafted to guarantee the thorough identification of relevant scholarly material. A comprehensive examination was conducted on esteemed and well renowned academic databases, such as PubMed, Google Scholar, ResearchGate, ProQuest, as well as specialized academic databases relevant to Bangladesh. The selection of these databases was based on their comprehensive coverage of scholarly research across several disciplines, thereby guaranteeing the inclusiveness of our search. In order to effectively identify studies that are in line with our study objectives, a meticulously selected collection of keywords was utilized. These keywords encompassed significant topics such as "gender," "entrepreneurship," "Bangladesh," "women entrepreneurs," and "gender disparities." The chosen databases are esteemed within the academic community and provide access to a diverse range of scholarly research across disciplines, offering a comprehensive view of gender and entrepreneurship in Bangladesh. The selection of keywords was deliberate, enabling the retrieval of literature that is both comprehensive in scope and highly relevant to the research context.

Data Extraction

The procedure of data extraction involved a systematic and rigorous approach to collect relevant information from the research that

were chosen. The data obtained from these studies was further categorized into theme clusters that corresponded to the fundamental elements of gender and entrepreneurship in the context of Bangladesh. The thematic categories discussed in this study include the various challenges encountered by women entrepreneurs, the policies and initiatives aimed at fostering gender-inclusive entrepreneurship, the economic implications of enterprises led by women, and the broader social empowerment outcomes that arise from women's involvement in entrepreneurship. The process of data extraction involved a wide range of material, including statistical data, qualitative observations, policy suggestions, and illustrative instances. The systematic organization of data into thematic categories facilitated a structured and holistic examination of key dimensions within the gender and entrepreneurship discourse, ensuring a comprehensive understanding of the literature. The incorporation of both quantitative and qualitative data sources enriched the depth and breadth of the review's findings, providing a comprehensive perspective on the topic.

Data Analysis

The data analysis phase applied a thematic analysis approach, designed to systematically identify and categorize overarching themes and sub-themes relevant to the exploration of gender and entrepreneurship within Bangladesh. This meticulous analysis aimed to uncover recurring patterns, emerging trends, and valuable insights within the literature. It provided an opportunity to delve into the challenges and opportunities confronting women entrepreneurs, evaluate the effectiveness of policies and initiatives, and explore the intricate economic and social implications of women's participation in entrepreneurship. Employing a thematic analysis approach allowed for the systematic exploration of complex and multifaceted topics, unveiling recurring patterns and overarching themes, and providing a nuanced and comprehensive review. Thematic analysis facilitated the exploration of the interconnectedness of various themes, illuminating how challenges, policies, and impacts intersect and influence one another within the context of gender-inclusive entrepreneurship.

Inclusion and Exclusion Criteria

The formulation of precise inclusion and exclusion criteria was crucial to maintain the rigor and relevance of the review. These criteria were thoughtfully established to ensure the selection of studies that are closely aligned with the research objectives and uphold rigorous standards of quality and pertinence. Inclusion criteria focused on relevance to the research objectives and maintained stringent standards of academic rigor, ensuring that the selected studies directly contributed to the review's objectives and met high scholarly standards.

Quality Assessment

Quality assessment was an essential step to ascertain the robustness and reliability of the selected studies. Each study underwent a rigorous evaluation process, with criteria encompassing research objectives, methodological soundness, data collection rigor, and overall relevance. This quality assessment process ensured that the findings included in the review were of high quality and dependable. Quality assessment guaranteed that only studies meeting a minimum standard of quality were included, enhancing the reliability and credibility of the review's findings.

Ethical Considerations

Ethical considerations formed the ethical backbone of this research. The research adhered to stringent ethical guidelines governing academic research, ensuring the responsible and ethical conduct of the research process. Proper citation and crediting of sources were meticulously observed, respecting intellectual property rights, and all data and findings from selected studies were reported objectively and without bias. Adhering to ethical guidelines is essential to maintain the research's integrity and credibility, promoting responsible research conduct.

Limitations

It is vital to acknowledge the inherent limitations of this research methodology. Although the systematic search strategy aimed for comprehensiveness, it might have inadvertently excluded insights from non-academic or grey literature sources. Furthermore, the scope of the review was contingent on the quality and extent of available literature within the specified timeframe.

Findings

Challenges Faced by Women Entrepreneurs

Women entrepreneurs in Bangladesh, despite their resilience and determination, grapple with a multitude of formidable challenges. This section delves into these challenges, shedding light on the hurdles that women must overcome in their entrepreneurial journeys. One of the foremost challenges faced by women entrepreneurs in Bangladesh is the restricted access to formal financial resources. This predicament arises from deeply ingrained gender biases within financial institutions. Women often encounter discrimination when seeking loans or investment capital for their businesses. These biases manifest as stringent collateral requirements, unfavorable lending terms, and sometimes outright denial of financial support (Ross & Shin, n.d.). As a result, many women find themselves in a perpetual struggle to secure the necessary funds to initiate or expand their enterprises, hampering their entrepreneurial ambitions. Bangladesh's social fabric is woven with strong societal norms and cultural expectations that often confine women to traditional roles. These entrenched gender norms dictate that a woman's primary responsibilities lie within the confines of her home and family. Consequently, women may face societal resistance when venturing into entrepreneurial pursuits that extend beyond these predefined roles (Webb et al., 2020). This restriction of opportunities constrains women's ability to explore diverse sectors and industries, limiting the scope of their entrepreneurial endeavors. Another significant challenge is the dearth of training and skill development opportunities tailored to the specific needs of women entrepreneurs. The absence of targeted training programs leaves women without the necessary skills and knowledge to navigate the complexities of entrepreneurship effectively. This skills gap not only impedes their ability to manage and grow their businesses but also undermines their confidence in pursuing entrepreneurial ventures. Without adequate training, women entrepreneurs may find themselves ill-equipped to compete in a competitive business environment. Building vital networks and accessing mentorship opportunities are crucial for entrepreneurial success. However, women entrepreneurs in Bangladesh often encounter barriers in this regard. Limited networking opportunities and a lack of access to mentors and support networks hinder their ability to connect with experienced entrepreneurs or

gain insights from established professionals (Rukmana et al., 2023). This lack of guidance and mentorship can be particularly challenging

for women who are navigating the entrepreneurial landscape for the first time.

Table 1
Challenges Faced by Women Entrepreneurs in Bangladesh

Challenges	Description
Access to Finance	Limited access to formal financial resources due to gender biases within institutions.
Societal Norms and Gender Roles	Confinement to traditional roles and societal expectations hindering entrepreneurial pursuits.
Skills and Training	Lack of tailored training opportunities essential for effective entrepreneurship.
Networking and Mentorship	Difficulties in building networks and accessing mentorship opportunities.

Note: Developed by Author

Policies and Initiatives

In recognition of the critical role that women entrepreneurs play in Bangladesh's economic development, various policies and initiatives have been implemented to promote gender-inclusive entrepreneurship. These efforts are designed to address the challenges women face and create a more supportive environment for their entrepreneurial ventures. One of the key initiatives aimed at supporting women entrepreneurs is the establishment of Women Entrepreneur Development Associations (WEDAs). WEDAs serve as platforms for networking, knowledge sharing, and resource access. They provide a space for women entrepreneurs to connect with like-minded individuals, share experiences, and gain insights from their peers. These associations also facilitate access to valuable resources, including information on business opportunities, funding options, and training programs (BEPZA, 2020). WEDAs play a pivotal role in building a sense of community among women entrepreneurs and fostering collaboration, which can be especially beneficial in a challenging entrepreneurial landscape. Another noteworthy policy initiative is the introduction of reserved quotas for women entrepreneurs in sectors traditionally dominated by men. Notably, the textile and garment industry, a cornerstone of Bangladesh's economy, has implemented such quotas. These quotas are designed to create

opportunities for women to participate in industries where they have historically been underrepresented (Hiltunen, 2020). By reserving a portion of opportunities for women, these policies aim to level the playing field and encourage women to venture into sectors that may have otherwise seemed inaccessible. Microcredit programs have played a pivotal role in extending financial services to women entrepreneurs in Bangladesh, particularly those in rural areas. Institutions like Grameen Bank, founded by Nobel laureate Muhammad Yunus, have been instrumental in providing small loans to women to initiate or expand their businesses (Bayulgen, 2008). These microcredit programs are tailored to the unique needs and circumstances of women entrepreneurs, making financial resources more accessible and empowering women to take control of their economic destinies.

These policies and initiatives collectively contribute to a more supportive and inclusive entrepreneurial ecosystem in Bangladesh. They recognize the significance of women's participation in entrepreneurship and seek to address the specific challenges they face. By providing networking opportunities, reserved quotas in key sectors, and access to microcredit programs, Bangladesh is taking meaningful steps to empower women entrepreneurs and enable them to thrive in the dynamic business landscape of the country.

Table 2
Policies and Initiatives Supporting Gender-Inclusive Entrepreneurship in Bangladesh

Policies and Initiatives			Description
Women Entrepreneur Development Associations (WEDAs)			Platforms for networking, knowledge sharing, and resource access.
Reserved Quotas			Quotas in sectors like textiles and garments to create opportunities for women.
Microcredit Programs			Programs extending financial services to rural women entrepreneurs.

Note: Developed by Author

Economic Impact

Women-led enterprises in Bangladesh have emerged as significant contributors to the nation's economy, making profound impacts on various aspects of economic development. This section delves into the substantial economic impact that these enterprises wield, highlighting their role in job creation, local economic growth, and income redistribution. Women-led enterprises play a pivotal role in job creation, which is particularly crucial in Bangladesh, a country characterized by a substantial labor force. These enterprises generate employment opportunities across various sectors, from small-scale manufacturing and agriculture to retail and services. As women entrepreneurs establish and expand their businesses, they hire employees, thus alleviating unemployment and underemployment. This not only improves the economic well-being of individuals and households but also contributes to the broader economic stability of the nation (Bhuiyan & Ivlevs, 2019). The economic influence of women-led enterprises extends beyond job creation. These enterprises bolster local economies by stimulating economic activity in their respective regions. When women invest in their businesses, they often procure goods and services locally, benefiting nearby businesses and suppliers. This localized economic activity has a ripple effect, promoting economic growth in communities and regions where these enterprises operate. As a result, women entrepreneurs become vital contributors to the economic vibrancy of their localities (Begum et al., 2019). Women's entrepreneurship contributes to income redistribution, a critical

aspect of economic development. Earnings generated by women-led enterprises often find their way into the hands of family members and dependents. Women frequently prioritize the well-being and education of their families, reinvesting their earnings to improve their quality of life. This income redistribution has a direct and positive impact on poverty reduction and social development, as it lifts households out of economic hardship and enhances their access to essential services (Kumar & others, 2019). The economic impact of women-led enterprises extends to family well-being. As women entrepreneurs increase their income and contribute to the economic stability of their households, they enhance the overall living standards of their families. Improved access to education, healthcare, and nutrition for family members becomes possible through the earnings generated by these enterprises. Thus, women's entrepreneurship plays a crucial role in improving the socio-economic conditions of their families, promoting a higher quality of life (Rahman et al., 2023).

Women-led enterprises in Bangladesh are dynamic drivers of economic development. Their contributions are multifaceted, encompassing job creation, local economic growth, income redistribution, and improvements in family well-being. These enterprises not only empower women economically but also have far-reaching positive effects on their communities and the nation as a whole. Recognizing and supporting the economic impact of women-led enterprises is essential for fostering inclusive economic growth and development in Bangladesh.

Table 3
Economic Impact and Social Empowerment Outcomes of Women-Led Enterprises

Impact		Description
& Outcomes		
Job Creation		Women-led enterprises significantly contribute to job creation.
Local	Economic	These enterprises bolster local economies and income redistribution.
Impact		
Family Well-being		Earnings often reinvested in family well-being, amplifying their positive impact.
Social	Women's entrepreneurship enhances decision-making power within households and communities.	
Empowerment		

Note: Developed by Author

Social Empowerment Outcomes

The impact of women's entrepreneurship in Bangladesh extends well beyond economic empowerment; it serves as a catalyst for profound social change. Engaging in entrepreneurial activities empowers women in various ways, enhancing their decision-making power within households and communities while challenging and reshaping traditional gender norms. This section explores the social empowerment outcomes of women-led enterprises, emphasizing their pivotal role in fostering a more equitable and inclusive society. Women entrepreneurs in Bangladesh often experience an increase in decision-making power within their households. As they take on leadership roles in their businesses, they also gain confidence and assertiveness, which can spill over into their domestic lives. This newfound agency allows them to actively participate in family decisions, including matters related to finances, education, and healthcare. By contributing to the family income, women have a more substantial say in how resources are allocated, leading to improved family well-being (Kabir et al., 2019). The very act of women engaging in entrepreneurial activities challenges traditional gender norms in Bangladesh. These entrepreneurial women serve as role models and break the stereotypical image of women confined to domestic roles. They defy societal expectations and demonstrate that women can excel in business and leadership positions. This

challenges deeply ingrained gender norms that have historically limited women's opportunities and reinforces the idea that women can participate fully in economic and social life (Miedema et al., 2021). Women's entrepreneurship plays an instrumental role in promoting a more equitable and inclusive society. By actively participating in economic activities, women contribute to the broader goal of gender equity. As women-led enterprises succeed and grow, they pave the way for a more diverse and balanced workforce. Moreover, the success stories of women entrepreneurs inspire and empower other women and girls to pursue their aspirations, fostering a culture of gender inclusion and equality (Fadil El-Turkey, 2021). Beyond individual empowerment, women's entrepreneurship has a positive ripple effect on communities. Successful women entrepreneurs often engage in philanthropic activities, reinvesting in their communities through initiatives such as education and healthcare programs. This community involvement enhances social cohesion and strengthens the overall social fabric. Furthermore, as women entrepreneurs create jobs and stimulate local economies, they contribute to poverty reduction and community development.

Recommendations

The outcomes of this systematic evaluation of literature offer a full comprehension of the

current status of gender-inclusive entrepreneurship in Bangladesh and present valuable insights that have substantial policy implications. Upon analyzing these findings, it becomes apparent that there are several crucial areas that necessitate the attention and intervention of policymakers and stakeholders in order to facilitate the empowerment of women entrepreneurs inside the nation. A significant obstacle encountered by female entrepreneurs in Bangladesh is to the constrained availability of formal financial resources, predominantly attributable to gender biases prevalent within banking institutions. It is of utmost importance to address this situation. It is imperative for policymakers to engage in collaborative efforts with financial institutions in order to effectively address and eradicate gender-based prejudice prevalent in lending practices. This objective can be accomplished by the modification of collateral prerequisites, the provision of financial products tailored specifically for women, and the enhancement of women's financial knowledge. In addition, it is imperative to enhance women's awareness regarding their financial entitlements and the array of options at their disposal. The lack of customized training options is a significant barrier. In order to tackle this difficulty, it is imperative for policymakers and educational institutions to formulate and execute all-encompassing training initiatives that are tailored to the unique requirements of female entrepreneurs. It is imperative that these programs incorporate fundamental skills in company management, financial literacy, and digital literacy. It is imperative to prioritize the accessibility of these initiatives, particularly in rural regions, to effectively engage a broader demographic of women entrepreneurs. The establishment of essential networks and the utilization of mentorship opportunities play a crucial role in achieving success in entrepreneurship. It is recommended that policymakers engage in collaborative efforts with business associations and non-governmental groups in order to enhance mentorship programs and networking platforms for women entrepreneurs. The establishment of an ecosystem that facilitates the mentorship and support of budding women entrepreneurs by experienced entrepreneurs has the potential to cultivate a culture characterized by the exchange of knowledge and collaborative efforts. The presence of women-led firms in Bangladesh carries significant economic and social ramifications. In addition to the economic

advantages associated with job creation and revenue generation, these firms also serve to boost local economic growth and facilitate income redistribution within the community. Acknowledging and highlighting the wider economic ramifications of women's entrepreneurship helps foster ongoing backing and investment in enterprises managed by women. The pursuit of women's entrepreneurship extends beyond its economic implications, as it also functions as a catalyst for driving social transformation. The empowerment of women within their households results in a notable augmentation of their decision-making authority, hence posing a challenge to conventional gender norms. Policymakers must utilize this facet of women's entrepreneurship in order to foster a society that is more just and fair. Public awareness campaigns that aim to showcase the achievements of women entrepreneurs possess the potential to challenge prevailing prejudices and serve as a source of inspiration for a greater number of women to engage in entrepreneurial pursuits. In anticipation of future inquiries, it is recommended that forthcoming studies undertake a more comprehensive exploration of the efficacy of particular policies and initiatives. Additionally, it is imperative to investigate the influence of technology in facilitating the empowerment of women entrepreneurs. Moreover, there is a need to concentrate on the experiences of marginalized communities. Lastly, it is advised to conduct longitudinal investigations to monitor the enduring effects of entrepreneurship on the economic and social empowerment of women. By strategically focusing on these specific domains and adopting policies that are grounded on empirical evidence, Bangladesh has the potential to establish a conducive atmosphere that fosters the success and growth of women entrepreneurs. This, in turn, will make a significant contribution towards building a society that is more inclusive and economically prosperous.

Conclusion

This systematic literature review examines the gender aspect of entrepreneurship in Bangladesh, uncovering significant obstacles encountered by female entrepreneurs, ranging from restricted availability of financial resources to societal standards that perpetuate conventional gender roles. The government's implementation of initiatives such as Women Entrepreneur Development Associations,

reserved quotas, and microcredit programs demonstrates its dedication to creating a conducive climate for support. Enterprises run by women make a substantial contribution to the creation of jobs, economic growth, and the redistribution of money. Additionally, they challenge traditional gender roles and promote fairness in society. The assessment underscores the necessity of focused interventions, with a particular emphasis on eradicating financial discrimination based on gender, establishing all-encompassing training programs, and broadening mentorship initiatives. Public awareness efforts that challenge preconceptions are essential for establishing a supportive atmosphere. Subsequent investigations should delve into the efficacy of policies, the influence of technology on the empowerment of female entrepreneurs, the experiences of marginalized communities, and the enduring consequences. By implementing evidence-based policies, Bangladesh may create an environment that promotes the success of women entrepreneurs, so contributing to a society that is more inclusive, fair, and affluent. This assessment is a significant resource for policymakers, scholars, and stakeholders who are dedicated to promoting gender-inclusive entrepreneurship in Bangladesh and other places.

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Factors Influencing Corporate Creditworthiness: Case Study in the Egyptian Banking Sector

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Abstract

Granting loans to corporate clients is the main source of income for banks. However, those loans are associated with a certain level of credit risk that is the inability of clients to meet their obligations toward banks. The occurrence of credit risk can negatively affect banks' profitability and business continuity. Considering the fast-evolving environment, the competition between banks, and the asymmetry of information, mitigating credit risk becomes a main duty of banks. The aim of this qualitative study was to determine the financial and non-financial factors that have a significant impact on corporate clients' creditworthiness. The aim is to help credit risk assessors to enhance the quality of the credit risk assessment and to make timely and accurate credit decisions. The study was focused on the Egyptian banking sector and distinguished between large companies and small and medium enterprises. The study revealed a list of financial and non-financial factors that have a significant impact on the creditworthiness of each category of companies as judged by credit risk assessors. The study also found that there are similarities and differences between both sizes of companies in terms of the factors that affect their creditworthiness.

Keywords: Credit risk, corporate creditworthiness, credit risk assessment, large companies, SMEs

Introduction

The banking sector plays a primary role in the economy by offering financial services to states, businesses, and people. Granting loans to finance industrial and non-industrial activities of corporate clients is one of the key roles of banks that boost economic growth (Çelik, 2019). However, banks are facing many challenges in assessing the creditworthiness of corporate clients to decide whether the quality of the credit is good or bad (Boushnak et al., 2018).

The Egyptian banking sector is similar to other banking sectors worldwide and it also faces

many challenges concerning the credit assessment of corporate clients. The banking sector in Egypt went through many economic challenges during the period from 2012 until 2022. First, the Egyptian revolutions that occurred in 2011 and 2013. Then, the Egyptian pounds (EGP) devaluation by 13% against the United States dollar (USD) on March 2016 was followed by the EGP free float on November 2016 (Ahmed & Ahmed, 2016; Lina & Asma, 2016). While the situation started to stabilize after all the major political and economic changes, the

banking sector faced a big challenge due to the spread of the Coronavirus pandemic that had affected the global economy worldwide and not only the Egyptian economy (Demirguc-Kunt et al., 2020). All aforementioned economic and political changes had an impact on the creditworthiness of banks' customers and their abilities to meet their obligations.

Furthermore, banks are working on growing their portfolios of clients to gain a larger market share and increase profitability in light of the fierce competition in the market (Shahin et al., 2021). To stay competitive, credit assessors make credit decisions within a relatively short time frame to face competition while analyzing a huge amount of data that cover different aspects. At the same time, decision-makers need to ensure the good quality of credit to avoid the increase in the non-performing loans ratio that negatively affects banks' profitability.

Moreover, the recent direction of the central bank of Egypt (CBE) is to expand the financing granted to corporate clients with a specific focus on the small and medium enterprises (SMEs) segment to stimulate the economy. In 2021, CBE mandated banks to expand the lending directed to the SMEs segment. As per CBE instructions, the SMEs segment should represent 25% of the total banks' portfolio by 2022 (Central Bank of Egypt, 2021). Worth to mention that there are many challenges associated with the assessment of the creditworthiness of SMEs specifically, due to the lack of reliability and transparency of information provided by SME clients (Boushnak et al., 2018).

Hence, credit risk assessors in the Egyptian banking sector are handling an increasing flow of credit loan applications in a fast-evolving environment and competition between banks so that the non-performing loans ratio could increase and negatively affect banks' profitability. This research was to determine the financial and non-financial factors that credit assessors perceive to have a significant impact on the creditworthiness of corporate clients. The objective of this study was to help credit risk assessors in focusing on important data that matter the most in making credit decisions so they can handle the increasing flow of credit loan applications while avoiding the occurrence of non-performing loans.

The study aimed to distinguish between the assessment of large companies and small and medium enterprises to examine if there is a

difference between the assessment of companies based on their size. That is important as both segments of companies are different in many characteristics such as the financial needs, the level of transparency, and the availability of data.

Asymmetric Information Theory and Bounded Rationality Theory

To find a foundation for the research, this study used the asymmetric information theory and the bounded rationality theory. The asymmetric information theory was first demonstrated by George Akerlof in 1970. According to Akerlof (1970), when asymmetric information exists between buyer and seller, it is difficult to distinguish between high- and low-quality goods. Asymmetric information exists when one of the two parties has more information than the second party which in turn has an impact on the decision made by the second party. In credit risk assessment, asymmetric information exists when the bank does not have access to complete information about the borrower to make credit decisions. According to Abad et al. (2017), the asymmetric information in credit risk is associated with firms' size, the smaller the size of a company the higher the existence of information asymmetry when dealing with banks.

Based on the bounded rationality theory introduced by Herbert Simon in 1955, humans cannot make perfect decisions due to their limited mental capabilities to collect and analyze information. Then, in the context of the credit risk assessment, credit assessors need to ration their credit decisions based on the relevant information they have access to (Antoine et al., 2021; Tfaily, 2017; Tupangiu, 2017).

The Credit Risk

Credit risk can be defined as borrowers' inability to repay their obligations to banks (Yoshino & Taghizadeh-Hesary, 2019). Poor credit risk management leads to increasing the level of credit risk and non-performing loans that in turn negatively affect banks' profitability. That is why the focus for banks is to set processes that can allow them to mitigate credit risk (Bouteille & Coogan-Pushner, 2021).

The Importance of Corporate Credit Risk Assessment

The credit risk assessment is a process

applied in all banks to evaluate the quality of credit applications and to decide whether a borrower is eligible to get a credit facility to mitigate the credit risk (Richard et al., 2019). Many researchers investigated corporate credit risk assessment and its importance in the banking sector. Arora and Kaur (2020) highlighted the importance of credit risk assessment for banks to make wise decisions and to avoid the occurrence of financial losses. Golbayani et al. (2020) and Kalimashi et al. (2020) emphasized the importance of credit risk assessment in banks, as the impact of companies' failure to repay their debts does not only affect the banks' profitability but also the country's entire economy. Other research studies have focused on the importance of credit risk assessment due to the increased level of loan default after the financial crisis, in addition to the increased capital requirements for banks to absorb potential credit losses (Munangi & Bongani, 2020; Noomen & Abbes, 2018).

Determinant Factors of Corporate Creditworthiness

Many previous studies have investigated the determinants that have a significant impact on the creditworthiness of corporate clients. Factors can be divided into two groups: financial factors and non-financial factors.

Financial Factors

Financial factors focus on the analysis of companies' financial statements such as the balance sheet, the income statement, and the cash flow statement (Gorgijevska & Gorgieva-Trajkovska, 2019). Yoshino and Taghizadeh-Hesary (2019) confirmed the importance of financial indicators for SMEs, especially the net income, short-term assets, liquidity, and capital. Similar to Yoshino and Taghizadeh-Hesary (2019), Yahaya and Ebrahim (2016) also confirmed the importance of the financial indicators in the assessment of SMEs companies in Malaysia, specifically the profitability ratio, the leverage ratio, the liquidity ratio, the activity ratio, and the investment ratio. The same results were found by Gupta et al. (2021) and Khemakhem and Boujelbene (2018).

Ebrahim (2019) examined the factors that have an impact on the creditworthiness of customers in the banking sector of the Kingdom of Bahrain. The study revealed that quantitative

factors have the most significant impact on customers' creditworthiness compared to qualitative factors as judged by credit risk assessors. Chodnicka-Jaworska (2021) found that leverage ratios such as the debt-to-equity ratio, the long-term debt-to-capital ratio, and the net debt-to-EBITDA ratio have the most significant impact on the creditworthiness of non-financial corporate clients where the debt-to-equity ratio is the most important factor.

Non-Financial Factors

The non-financial factors that are considered in credit risk assessment focus on the qualitative characteristics of companies such as the management, and the scope of business (Gorgijevska & Gorgieva-Trajkovska, 2019). Antoine et al. (2021) examined the factors that have an impact on banks' decisions to grant loans to SMEs in Congo. The study found that the main six factors that have an impact on the creditworthiness of SMEs are the submission of all information required by the bank, the capacity to present a mortgage guarantee, having a credit facility from a bank, having a business banking account, the registration of the company in the commerce chamber, and having a profitable investment during the last 12 months.

Imaduddin and Sharofiddin (2021) studied the factors that affect the credit assessment of corporate clients in Islamic banks in Indonesia. The study found that as judged by credit assessors of Indonesian Islamic banks, the 5Cs of credit (character, capital, condition, collateral, and capacity) have important weight when approving a credit application where the fixed assets collateral and capacity of borrowers are the most important factors. The study also found that COVID-19 has an impact on the creditworthiness of corporate clients and negatively impacted their capacity for repayment. Borish (2020) proved that there is a positive relationship between the size of the company and the company's ability to have access to capital. The study elucidated that there is a diverse range of reasons why large companies have more access to credit than SMEs including but not limited to their solid financial position, the presence of fixed assets that can be pledged as collateral to cover the debt amount, higher levels of transparency and disclosure of information and market power.

Methods and Materials

This study used the qualitative research method since the purpose of the research was to determine what are the financial and non-financial factors that have a significant impact on the creditworthiness of corporate clients from the point of view of credit assessors. Based on obtained results, the study compared the difference between large companies and SMEs in terms of the factors that affect their creditworthiness. The research was a case study of corporate creditworthiness assessment based on the experience of credit risk assessors in the Egyptian banking sector.

The Target Population and Sampling Design

This study targeted two different populations; the large corporate credit risk assessors and SME credit risk assessors who are working in the Egyptian banking sector. There were participants from each population. The purposive sampling technique was used since what matters is the selection of a sample of participants who were able to provide in-depth information that can help in reaching the objective of the study. The sample from the population was five interviewees from large companies' credit risk assessors and three interviewees from SMEs' credit risk assessors. According to the Central Bank of Egypt (CBE; 2017), an SME is defined as a business with less than 200 employees whose annual sales turnover does not exceed EGP 200,000,000. A large corporation is defined as a business with more than 200 employees and whose annual sales turnover exceeds EGP 200,000,000.

Data Collection

To collect data, an interview was conducted with the credit risk assessors either through face-to-face meetings or through Zoom meetings based on the preferences of participants. Potential participants were contacted through the professional platform Linked In and referrals from those who agreed to participate in the study. Data were also collected through the researcher's observations and notes taken during the interview.

Instrumentation

The instrument of the data collection was a semi-structured interview that is designed by the researcher and approved by the dissertation committee. The same interview questions were

asked of large companies and SMEs credit risk assessors. Each sample of participants was studied separately, then the responses of large companies' credit risk assessors were explored with SMEs' credit risk assessors to see differences between the financial and non-financial factors that had an impact on the creditworthiness of both segments of companies. Participants were not asked to reveal any confidential information related to them, their institutions, or their clients.

Data Analysis

The data analysis process of this study followed Yin's (2018) five steps of qualitative data analysis. The first step was compiling a database to organize and prepare data for analysis. Data were collected through participants' responses to the interview questions, observations, and notes that were taken during the interview. After collecting data, data were manually transcribed from audio data to text. The second step was disassembling data which consists of breaking down transcribed data into fragmented labels and categories. The third step was reassembling data which consisted of finding patterns and relationships among the categories. Disassembling and reassembling (steps two and three) were done through manual data coding. For this study, data from interviews and notes were coded into themes. After organizing the data, the researcher compared participants' answers and counted the frequency of common answers to find patterns and relationships in the data. For this study, factors that were mentioned by at least two participants were considered important factors in the credit risk assessment of corporate clients.

The next step in the data analysis was the interpretation phase. In this stage, the data were in a narrative way that could help in linking data and explaining the themes in depth. The participants' answers were presented for each group of companies. Then, a comparison of large companies and SMEs' credit risk assessors' answers was conducted to detect similarities and differences between both companies' segments. The last step was drawing conclusions about which financial and non-financial factors had a significant impact on the creditworthiness of corporate clients as judged by credit risk assessors.

Results

For large companies, the credit risk assessors highlighted many important financial and non-financial factors that have a significant impact on the companies' creditworthiness. Concerning the financial factors, credit risk assessors analyze the current ratio, the quick ratio, and the component of the inventory to assess the liquidity of a company. At the level of solvency, credit risk assessors examine the leverage, the gearing ratio, and the debt service coverage ratio. Regarding the profitability of a company, they assess the gross profit margin, the net profit, the operating profit, and the components of income sources. To assess the activity of a company, assessors look at the asset conversion cycle (ACC) ratios. At the level of cash flow analysis, credit risk assessors analyze the cash flow generated from operations, the cash flow from investing sources, and the cash flow generated from financing sources.

Overall, at the level of financial factors, the large companies' credit risk assessors assigned an important weight to profitability and solvency ratios. For them, profitability reflects to what extent the management was capable of managing everything related to the other financial aspects and generating a profit in the end. Concerning solvency, the capacity of repayment is important for the assessors as the bank will be one of the company's lenders. Accordingly, it is important to check if the company's existing and future debts will be honored.

To assess the ownership of a company, they first determine the owners of the company and then assess the level of their involvement in the business as well as their experience in the field. Concerning the management assessment, the factors that matter the most are the experience of the management in the business, the existence of a second line of management, and the vision of the management. Concerning the credit documents that reflect credit behavior, credit risk assessors require financial statements, the commercial register, the journal of incorporation, and the investigation report. In addition, they assess the aggregate position report issued by the CBE, the I-Score, the protesto, and the bankruptcy reports. When structuring the credit facility, credit risk assessors heavily weigh the offered product, the amount, and the tenor of the facility versus the company's needs. Furthermore, they assess the source of

repayment, the guarantees offered by the clients, and the disbursement mechanism of the credit facility. In addition to all the beforementioned factors, they highlighted that external factors such as the industry of the company, COVID-19, the devaluation of the local currency, and the competition between banks have a significant impact on the creditworthiness of large companies.

At the level of non-financial factors, the large companies' credit assessors heavily weighed the management and ownership indicators. If the management is strong and has a plan for the company, this will positively affect the overall performance of the company's operations. On the other side, the absence of vision exposes the company to several problems, such as bankruptcy. In addition, ownership shows how interested owners are about the company's business and to what extent they are willing to expand the company's activity.

At the level of SMEs, the credit risk assessors highlighted many important financial and non-financial factors that significantly affect the companies' creditworthiness. Concerning the financial factors, credit risk assessors do not heavily weigh the financial statements presented by companies due to the lack of credibility. However, they consider some ratios extracted from the financial statements to conduct the credit assessment of clients. They analyze the current ratio, the cash flow generated from operations, and the debt service coverage ratio to assess the liquidity and the cash flow of a company. At the level of solvency, credit risk assessors examine the leverage. Regarding the profitability of a company, credit risk assessors assess the return on sales and the operating profit to sales. To assess the activity of a company, credit risk assessors look at the ACC ratios. Overall, the assessment of SMEs is not essentially based on financial factors as the credit assessors exert great effort to verify the correctness of the figures presented in the companies' financial statements.

Concerning the non-financial factors, the credit risk assessors examine the existence of a second line of management, the years of experience in the market, and the trend of injecting fresh funds into the company by the owners to assess the ownership and management of a company. Regarding the credit documents that reflect the credit behavior, the credit risk assessors require many supporting

documents to verify the business of the company such as sales proof and contracts with the agencies. They also check the commercial register, the investigation report, the aggregate position report issued by the CBE, the I-Score, the protesto, and the bankruptcy reports. In addition, they assess the track record of the company with other banks. When structuring the credit facility, the credit risk assessors heavily weigh on the offered product and the tenor of the facility versus the company's needs, the guarantees offered by the clients, the source of repayment, and the disbursement mechanism of the credit facility. In addition to the aforementioned factors, the credit risk assessors highlighted that external factors such as the industry of the company, COVID-19 and the CBE instructions to expand granting credit facilities to SMEs have a significant impact on the creditworthiness of SMEs.

Overall, the SMEs credit assessors rely more on the non-financial factors than on the financial factors, especially the documents and the information related to the credit behavior of the clients. When making credit decisions, obtaining sales proof, conducting site visits to the client, and getting more information about how the client deals with customers, suppliers, and other banks are more reliable indicators of the client's activity than the financial statements presented by the client.

For all companies, the creditworthiness assessment is an ongoing process that is applied when initiating a new relationship with a corporate client and for existing clients as well. All corporate clients included in a bank's portfolio are reviewed periodically to ensure that all aforementioned financial and non-financial factors are maintained within the acceptable level that reflects the companies' ability to meet their obligations towards banks. The ongoing monitoring of corporate clients helps in detecting the early warning signs that can negatively affect the creditworthiness of clients and allow banks to make decisions that preserve their rights.

This study revealed some similarities and differences between the credit risk assessment of large companies and SME. The common financial factors between both types of companies are the current ratio, the debt service coverage ratio, the leverage, the net profit, the operating profit, and the ACC ratios. The common non-financial factors between both types of

companies are the presence of the second line of business, the assessment of the aggregate position issued by the CBE, the investigation report, the commercial register, the I-Score, the protesto, and the bankruptcy reports, the source of repayment, the offered product, the facility tenor, the disbursement mechanism, and the guarantees. In addition, external factors have an impact on the credit risk assessment of large companies and SMEs.

On the other side, there are differences in the credit risk assessment between SMEs and large companies such as the degree of reliance on the financial statements presented by companies. The study found that the SMEs credit risk assessors do not rely on the financial statements presented by the clients. Accordingly, they do not do a deep analysis of the financial ratios and the cash flow statement of the SMEs companies. SMEs credit risk assessors require many supporting documents to check the activity and the business of the client and weigh heavily on the support and guarantees for structuring the credit facilities. At the level of ownership and management, assessors examine both ownership and management jointly, given that the owner and manager of SMEs are commonly the same person.

In contrast, the credit risk assessors of large companies rely on the financial statement presented by the clients and conduct a deep analysis of the financial ratios and cash flow statements. They heavily weigh the assessment of ownership and management and assess them separately given the nature of the governance of large entities where the management and ownership are separate. Compared to SMEs Credit risk assessors of large companies give less importance to the support and guarantees and the supporting documents that prove the activity and the business of the clients.

Discussion/Implications

The results of the study could bring the attention of credit risk assessors to important financial and non-financial factors they need to consider when assessing the creditworthiness of companies. The focus on important factors could enhance the credit risk assessment process and reduce the non-performing loans and banks' losses. The findings of the study can be used as a prescreening list that can help credit risk assessors to filter good and bad credit

applications before doing further analysis. The results of the study could also be used as a reference list to build an internal risk rating model and each bank could assign a weight to each factor based on the risk appetite of the bank.

Other than banks, the findings of the study could be used by large companies and SMEs operating in the Egyptian market to know how banks assess them and what factors they need to enhance and develop to get credit facilities. Furthermore, credit assessors who work in countries other than Egypt can use the findings of this study to compare their practices to the practices of Egyptian credit risk assessors. That can help in sharing experiences across different countries and gaining new knowledge.

Future research could be applied in different countries other than Egypt to show the different criteria used by credit risk assessors in different locations. Future research can select a specific industry and provide a deep analysis of the credit assessment of this industry. Future researchers could also select more than one industry and compare similarities and differences of their credit assessment in the same study. The findings of this study represent a preliminary step to conduct quantitative research to build a risk rating model. The quantitative research could assign weight to each factor in terms of its importance in the credit risk assessment.

Conclusion

This paper presented the important financial and non-financial factors that have a significant impact on the credit risk assessment of corporate creditworthiness in the Egyptian banking sector. The qualitative study distinguished between the credit risk assessment of large companies and SMEs. The findings of the study could serve as a reference for credit risk assessors to focus on important factors. Focusing on them could enhance the quality of the credit risk assessment process and help credit risk assessors in making the right credit decisions. This in turn will lead to reducing non-performing loans and banks' losses.

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Labor Shortages in the Hospitality Industry: The Effects of Work-Life Balance, Employee Compensation, Government Issued Unemployment Benefits and Job Insecurity on Employees' Turnover Intentions

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Abstract

The purpose of this quantitative research was to identify the factors causing labor shortages in the hospitality industry in the post-pandemic era. Specifically, it examined the effects of work-life balance, employee compensation, government-issued unemployment benefits, and job insecurity on employees' turnover intentions. The research methodology employed in this study was a quantitative survey, with a sample size of 385 participants from the hotel, restaurant, bar industry, and food service sector. The findings indicated work-life balance, employee compensation, and job insecurity had a significant impact on employees' turnover intentions, as the null hypotheses for these factors were rejected. However, the government-issued unemployment benefits (EDD) did not show any significant impact, indicating further research is needed to gain deeper insights into the potential influence of these benefits. These findings contribute to the understanding of the challenges faced by the hospitality industry in retaining employees and highlight the importance of addressing work-life balance, compensation, and job insecurity to mitigate employee turnover.

Keywords: Labor shortages, hospitality industry, work-life balance, employee compensation, EDD benefits, job insecurity, COVID-19, pandemic, workplace safety, employee retention

Introduction

The impact of the COVID-19 policies on the hospitality industry was devastating, leaving millions of workers unemployed (Jung et al., 2021). Although many countries' economies are on their way to recovery, companies struggle to fill in vacant positions, as they do not get enough applicants (Kwok, 2021). It causes labor shortages in the country, making the labor market extremely competitive with rising wages. According to Lock (2021), the total hospitality jobs in the United States (U.S.) increased to 13.13 million as of December 2020. It is still not close to its pre-pandemic levels of 17 million. Per EDD's

industry employment report (2022), accommodation and food services sectors showed 1.7 million employees as of February 2020, dropping to 985,000 in March 2020. Similarly, the turnover rate in the leisure and hospitality sector alone decreased to 84.5% from 130% of its peak but is still higher than the national average turnover rate of 36.4% (Lock, 2022).

According to Kwok (2021), the unemployment number dropped from its peak at 23 million in May 2020 to 3.12 million in July 2021, as the restrictions were lifted. Kwok (2021) noted that filling the vacant positions has become a

major issue; people are simply not applying for jobs, even at higher wages, for instance, if a restaurant was offered \$20 hourly rate for a hostess position in 2019, would have received hundreds of resumes, currently with \$30 hourly pay for the same position, the same restaurant has received zero applicants. The economic recovery after the pandemic has taken over two years, and even though the majority of the hospitality jobs were filled and the employment of accommodation and food services sectors went up to 1.6 million as of November 2022, companies still struggle with high turnover rates (EDD, 2022). Therefore, it is important to study why those open positions remain unfilled even when there are many jobs available within the hospitality market.

The inability to fill in the vacant positions led to labor shortages, which in turn have negative impacts on the labor market, in the form of increased inflation rates. Many economists define labor shortage in the context of wage adjustment, meaning most labor shortages will disappear if employers increase wages to attract workers (Matemani & Ndunguru, 2019). Blank and Stigler (1957) highlighted when there are labor shortages, salaries will rise, and jobs completed by more skilled workers will then be performed by employees who are less trained and experienced. Labor shortages can occur for many reasons, particularly because of environmental changes and economic disruption. With the COVID-19 mandates, massive layoffs and scale-downs occurred, negatively impacted employees' perceptions of job stability and motivation to work (Jung et al., 2021). Today, the biggest problem is that even when companies try to increase wages and offer sign-on bonuses to be more appealing to the applicants, many are still not willing to accept these offers, leading to inflated wage rates. This leads to the important question, "Why there is a labor shortage?"

Theoretical Concept and Literature Review

Herzberg's two factor theory is employed to help explain the relationship between factors influencing employee's turnover intentions. The theory distinguishes hygiene or extrinsic factors, encompassing work environment, relations conditions, policies, compensation, often linked to dissatisfaction, and motivational or intrinsic factors that include recognition and growth are

tied to positive feelings (Chiat & Panatik, 2019). These factors interact differently and require synchronization for enhanced job satisfaction (Alrawahi et al., 2020). Particularly relevant in the hospitality industry in the post pandemic era, this framework aids in understanding identified factors' impact on turnover intentions and guiding strategies for improved employee satisfaction and performance.

Job Insecurity

Because of COVID-19 policies, occurring on a global scale, there was a significant number of layoffs and people experiencing high levels of physical and psychological risks. Bajrami et al. (2019) asserted factors such as job insecurity, health complaints, and risk-taking behavior significantly affect employee's turnover intentions and work-related attitudes. In the hospitality industry, uncertainty of employment in the hospitality industry can cause an immediate threat to organizational performance and viability (Jung et al., 2021). In modern working environments, economic fluctuations, political elements, and technological changes are not able to guarantee work stability to all employees. Hence, job insecurity may become a significant stressor on employee's job engagement and turnover intentions. Other factors may contribute to labor procurement issues as well.

Work-Life Balance Issues

Lestari and Margaretha (2021) noted that lack of balance between work and personal life causes stress which affects employees' intention to leave the company and leads to high turnover rates. Long working hours create fatigue and stress for employees and negatively affects their performance, motivation, and job engagement (Gandi et al., 2011; Jiandog et al., 2022). The hospitality industry is known for its extensive long work hour culture, in most cases, hotels and restaurants operate 24/7 and 365 days per year, including weekends and public holidays (Talip, et al. 2021). The industry is labor-intensive, where physically being at work is a mandate, and unfortunately, there are few remote work opportunities for the line staff. Per Bali et al. (2021), the hospitality industry is very demanding; the constant pressure, the new innovative trends and constantly changing consumer preferences are becoming too stressful for employees to

handle, affecting their behaviors and relationships at home, creating conflicts. Therefore, managing a balance between work and personal life can be challenging and can affect employees' decisions to quit their jobs. Additionally, living through the crisis of the COVID-19, many people started to reassess the meanings of their lives and prefer more work-life balance, and more flexibility (Kwok, 2021).

Compensation Issues

The hospitality industry has been known for its notorious low-wage systems and low-skill type of jobs (Jolly et al., 2021). The industry has been at a disadvantage in the competitive labor market. According to Molla (2021), even though the pay for non-managers in the hotel sector rose about 13%, compared to the year prior to the pandemic, the average wage is still less than \$17, it is less than the next lowest-paid sector in US economy, retail with \$18.68 per hour. Individuals in the hospitality industry normally work part-time, putting up to 25 hours a week, which gives an average of \$416.08, as opposed to other industries, where average people put in more hours working part-time, hence bigger paychecks. Low compensation could be a major factor, why employees do not want to return to their old hospitality jobs after the pandemic.

Extended Unemployment Benefits

Another possible reason for labor shortage is the boosted unemployment benefits discouraging people from working (Kwok, 2021). Extra money received from the government was much more rewarding than their earned wages; hence, letting people question their willingness to return to work under the same working conditions. Before the pandemic, on average, an hourly employee within the hospitality industry earned approximately \$15, ranging between \$450-\$600 per week (Hoff & Warren, 2022). During the pandemic, the regular unemployment benefits were \$450, additionally California state government distributed \$600 pandemic assistance, with the sum of \$1050 weekly payment (Petrosky-Nadeau, & Valletta, 2021). For months, individuals were paid more than they would normally get without even working, which could possibly discourage the majority of them from looking for jobs and rather remain unemployed. Therefore, the boosted unemployment benefits

may be another major reason for individuals' unwillingness to return to work.

Previous studies addressed the importance of job insecurity, the COVID-19 mandates, health complaints and work-life balance on employees' work-related attitudes, and labor market dynamics (Bajrami et al. 2019; Jung et al. 2021). There have been studies addressing the impact of work-life balance on employees' turnover intentions during the pandemic (Jaharuddin & Zainol, 2019; Lie et al., 2021). However, there is a lack of research on labor shortage causes in the hospitality industry and stressing factors influencing employees' entry in the labor market post-pandemic, despite the country's economic recovery.

Problem Statement: Factors like work-life balance, compensation, job insecurity and unemployment benefits could predict turnover intentions causing labor shortages. This problem poses significant challenges for the hospitality industry; labor shortages result in service quality decline, guest dissatisfaction, cancellations, delays, revenue loss (Hemington, 2007). Financial strain on companies is another consequence driving the need for measures like higher wages, bonuses, perks and improved conditions to fill vacancies. As a customer-centric industry, the hospitality sector's success relies on skilled staff for enhanced customer satisfaction (Holston-Okae, 2018). Hence, essential research is needed to identify post-pandemic labor shortage causes to enhance working conditions and attract the right personnel to the industry's success.

The purpose of the current research is to conduct a survey that will examine the factors causing labor shortages and assess significant effects on employee's willingness to re-enter hospitality labor market in the post pandemic era. The study aims to identify whether work-life balance, employee compensation, government issued unemployment benefits, and job insecurity may be the main predictors of causing labor shortage and affecting employees' turnover intentions.

Research and Methods

Research Methodology

This study aims to measure the significant impact of these four primary factors on employees' willingness to re-enter the hospitality

labor market. To measure the effects of these factors and how significant the impact is on employees' turnover intentions, a survey method is best suited to conduct this research.

The study draws hypotheses, which are primarily used in quantitative research. This research proposes a hypothesis to test whether work-life balance, employee compensation, unemployment benefits, and job insecurity significantly impact employees' willingness to re-enter hospitality labor market in the post pandemic era.

Research Questions and Hypotheses

The research questions and hypotheses are as follows:

Research Question 1: To what extent does work-life balance affect hospitality employees' turnover intentions?

Hypothesis 1:

H₁₀: There is no significant impact between work-life balance and hospitality employees' turnover intentions.

H_{1A}: Work-life balance significantly impacts hospitality employees' turnover intentions.

Research Question 2: To what extent does employee compensation impact hospitality employees' turnover intentions?

Hypothesis 2:

H₂₀: There is no significant effect between employee compensation and hospitality employees' turnover intentions.

H_{2A}: Employee compensation significantly affects hospitality employees' turnover intentions.

Research Question 3: To what extent do government issued unemployment benefits affect hospitality employees' turnover intentions?

Hypothesis 3:

H₃₀: There is no significant impact between government issued unemployment benefits and hospitality employees' turnover intentions.

H_{3A}: Government issued unemployment benefits significantly impact hospitality employees' turnover intentions.

Research Question 4: To what extent does job insecurity affect hospitality employees' turnover intentions?

Hypothesis 4:

H₄₀: There is no significant effect between job insecurity and hospitality employees' turnover intentions.

H_{4A}: Job insecurity significantly impacts hospitality employees' turnover intentions.

Research Design

Quantitative methods, particularly surveys, are ideal for assessing relationships between different variables (Daniel, 2016). A survey instrument was selected for this research as it offers specific insights from a large sample, facilitating objective analysis of data. This study employed a non-experimental correlational design, gauging relationships between multiple variables. SurveyMonkey was used for data collection due to its accessibility to a broader population.

The survey, comprising four sections with 25 questions, aligned well with the variables and hypotheses. Demographic questions on participants' age, gender, marital status, and income were asked to help interpret the results. *The questions regarding unemployment benefits are also part of the demographic questions to determine the right population for this research.*

The survey instruments include various scales to measure these variables: multidimensional work-family conflict, employee compensation, job insecurity and turnover measurement, which are validated in different studies, and are based on 5-point Likert scale system from 'strongly agree to strongly disagree.'

The study's population refers to the number of employees working in the accommodation and food services sectors, but whose jobs were impacted by the COVID-19 mandates, accounting for 1,641,100 in November 2022 according to EDD California reports (2022). For maximum validity, a sample of 385 participants is determined using the sample size formula with a 5% margin of error, 95% confidence and 50% population proportion. Multiple sampling methods, like random and convenience sampling

were employed to ensure unbiased representation of the entire hospitality workforce.

Research Limitations

The sample size of the research is only 385 individuals who may not represent the entire hospitality industry, as it is limited to only hotels, restaurants, bars, and food services sectors. The study is limited to California state only. Additionally, there is a time gap between the data collection that has been done in 2023 and the individuals who received the unemployment benefits in 2020, making it difficult to accurately measure the impact of unemployment benefits on employees' willingness to work. The survey's design may not fully capture unemployment benefits' significance on turnover intentions during the pandemic. It studies only four factors, potentially overlooking others. Response bias is a big concern, as participants' perspectives on COVID-19 may be different and studied factors may lead to biased answers.

Results

A total number of 394 responses were collected, however, nine of them were disqualified to continue the survey as they answered no to the screening question whether they worked in the hospitality and/or restaurant/bar industry before March 2020, which means they do not represent the population of this research. Hence, a total number of 385 responses were used to analyze the data.

To detect any missing values, examination of data occurred by both visual inspection and frequency analysis. Based on the observation, a few cases had less than 4% missing values. The most detected were 5% among the questions: I feel insecure about my future job; in the near future I think I may lose my job; I often think of leaving the organization; it is very possible that I will look for a new job next year. These missing values were replaced by mode, which is the most common value or most frequent value of the entire column (Mertler, & Vannatta, 2016). In the context of this study, which utilizes a categorical/ordinal dataset, certain outliers were observed during the pre-processing stage, specifically those associated with discrete numeric variables. Such variables included age, income level and the duration of receiving unemployment benefits. These outliers were

analyzed as part of the pre-processing stage to assess validity and discovered there was no major deviation from the pattern, hence there was no potential impact on subsequent analyses.

According to the survey results, out of 385 participants, 355 reported their employment was impacted by COVID-19 policies, while 30 experienced no impact. Around 66% quit or were furloughed, 71% of furloughed individuals returned to their old jobs, 29% were not asked to return. Overall, 324 employees returned to the hospitality industry, but not necessarily to their old jobs. As part of the demographics, out of 385 employees, approximately 213 respondents were female, and 172 were male. The majority of the participants (37.9%) belonged to the 25-34 age group, and 25.2% belonged to the 35-44 and 45-54 age group. Among these respondents, the majority were Hispanic (120 people) and white/Caucasians (146). Additionally, the largest group of people (33.8%) reported being married and 32.2% were single.

Hypothesis 1. Work-Life Balance on Employee's Turnover Intentions.

A multidimensional work-family conflict scale was used in the research to measure employees' work-life balance. The 5-point Likert-scale categorical variables were given numerical values to be able to run statistical tests and were encoded in SPSS, as follows: 1 = neutral; 2 = strongly disagree; 3 = disagree; 4 = agree; 5 = strongly agree. Composite scoring was used to reduce the complexity of the data and allow better interpretation and more meaningful measurement of variables. The composite score of the 9-item work-family conflict scale was calculated by adding up the participants ratings on each item and divided by nine. To test hypothesis one, the same method applied to employee turnover intention variables, where the mean score of all the ratings was divided by three.

One-Way ANOVA

One-way ANOVA is a statistical technique used to compare the means of three or more groups. It examines whether there are statistically significant differences between the means of the groups (Kim, 2017). It also allows the understanding of the relationship between one independent variable and dependent variable.

Table 1
Hypothesis 1- One-Way ANOVA

ANOVA					
Turnover Intentions					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	26.466	25	1.059	1.948	.005
Within Groups	195.057	359	.543		
Total	221.523	384			

ANOVA Effect Sizes^{a,b}

		Point Estimate	95% Confidence Interval	
			Lower	Upper
Turnover Intentions	Eta-squared	.119	.011	.123
	Epsilon-squared	.058	-.058	.062
	Omega-squared Fixed-effect	.058	-.057	.061
	Omega-squared Random-effect	.002	-.002	.003

- a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.
b. Negative but less biased estimates are retained, not rounded to zero.

The ANOVA table provides information about the significance of differences in means of Turnover Intentions between groups. It appears that there is a statistically significant difference between the groups, with an F-value of 1.948 and a p-value of .005. It suggests the H_0 can be rejected, and the alternative hypothesis is accepted that work-life balance has a significant impact on employees' turnover intentions.

measure employee compensation, which is a 10-item instrument also based on 5-point Likert scale from 'strongly agree' to 'strongly disagree'. 'The composite scoring was applied as well to enable statistical analysis.

To answer research question two: 'to what extent employee compensation affects hospitality employees' turnover intentions', the same statistical test, such as one-way ANOVA, was used to test hypothesis 2.

Hypothesis 2: Employee Compensation

A compensation scale developed by Twalib and Magutu (2017) was used in this research to

One-Way ANOVA

Table 2
Hypothesis 2 - One-Way ANOVA

ANOVA					
Turnover Intentions					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	25.858	25	1.034	1.898	.006
Within Groups	195.665	359	.545		
Total	221.523	384			

ANOVA Effect Sizes^{a,b}

		Point Estimate	95% Confidence Interval	
			Lower	Upper
Turnover Intentions	Eta-squared	.117	.009	.119
	Epsilon-squared	.055	-.060	.058
	Omega-squared Fixed-effect	.055	-.060	.058
	Omega-squared Random-effect	.002	-.002	.002

- a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.
b. Negative but less biased estimates are retained, not rounded to zero.

The ANOVA table shows that the sum of squares between groups is 25.858, the degrees of freedom (df) are 25, and the mean square is 1.034. The F-statistic is 1.898, and the p-value or significance level is 0.006.

The F-statistic tests the null hypothesis that there is no difference in the means of the groups. The low p-value of 0.006 indicates that there is a statistically significant difference between the means of the groups. Overall, the results of the ANOVA test suggest that employee compensation is a significant predictor of Turnover Intentions, which means that the null hypothesis can be rejected.

Hypothesis 3: Unemployment Benefits (EDD) on Employees' Turnover Intentions.

To examine the potential impact of government-issued unemployment benefits (EDD) on employees' intentions to leave their

jobs, the research study included a series of demographic questions to gather information from participants regarding their receipt of unemployment benefits during the COVID-19 pandemic. Closed-ended questions with yes or no answers were asked respondents whether they have received unemployment benefits or not. The categorical data were given numerical values and encoded into SPSS such as 1 = no; 2 = yes, to enable statistical analysis.

Sample T-Test

To identify any potential correlations between receipt of benefits and employees' intentions to leave their jobs, a sample-test was used to analyze the data. A sample t-test is a statistical test used to compare the means of two independent groups and determine whether there is a statistically significant difference between the means of two groups (Skaik, 2015).

Table 3

Hypothesis 3 - Sample T-test

Group Statistics

	Did you receive unemployment benefits during the COVID 19 pandemic	N	Mean	Std. Deviation	Std. Error Mean
Turnover Intentions	1	74	3.2252	.78049	.09073
	2	311	3.2433	.75570	.04285

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	t	df	Significance One-Sided p	Significance Two-Sided p	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
Turnover Intentions	Equal variances assumed	.043	.836	-.184	383	.427	.854	-.01808	.09836	-.21147	.17532
	Equal variances not assumed			-.180	107.936	.429	.857	-.01808	.10034	-.21697	.18082

Table 3 shows the results of an independent samples t-test to compare the mean values of the Turnover Intentions variable between two groups: those who received unemployment benefits

during the COVID-19 pandemic (group 1) and those who did not receive benefits (group 2).

The output shows that the mean values of the two groups are very similar, with group one

having a mean of 3.2252 and group two having a mean of 3.2433. The t-test results indicate that there is no statistically significant difference in the mean values of the two groups, as the p-value (Two-Sided p) is greater than the typical alpha level of 0.05.

The effect size estimates (Cohen's d, Hedges' correction, and Glass's delta) suggest that the difference between the means is small, with effect size estimates ranging from -0.277 to 0.230. Overall, these results suggest that receiving unemployment benefits during the COVID-19 policies may not have a significant impact on employees' turnover intentions.

Spearman's Correlation Coefficient

As the Sample T-test did not show significant results, additional tests were run to see if there was any other correlation between unemployment benefits and employees' turnover intentions.

The initial assumption was that the annual income may affect employees' perspectives in

regard to unemployment benefits and their willingness to return to work, indicating that since the hospitality industry is a low-income industry, that the majority of respondents fall into 25,000-75,000 income range, while the average income in California is \$63,000 according to EDD employment reports (2022). It assumed that people may have been more satisfied with the additional income received from the government while not working compared to their own income while they were working. Therefore, besides sample T-test, it was important to conduct additional test to understand if there is any correlation between these variables.

Spearman's correlation coefficient was used to test the strength and direction of association between ranked variables. According to Skaik (2015), it is a non-parametric measure of the monotonic relationship between ordinal or ranked data and more appropriate to use when measuring the impact of annual income on turnover intentions in regard to receiving unemployment benefits.

Table 4
Hypothesis 3: Spearman's Correlation

		Correlations						
			What is your annual income?	Did you receive unemployment benefits during the COVID-19 pandemic?	How long did you receive unemployment benefits?	How often do you think of leaving the organization?	Is it very possible that you will look for a new job next year?	If you could choose again, would you choose to work for the current?
Spearman's rho	What is your annual income?	Correlation Coefficient	1.000	-.079	-.011	-.060	-.065	.039
		Sig. (2-tailed)	.	.122	.827	.237	.200	.443
		N	385	385	385	385	385	385
	Did you receive unemployment benefits during the COVID-19 pandemic?	Correlation Coefficient	-.079	1.000	.024	.082	.003	-.045
		Sig. (2-tailed)	.122	.	.633	.109	.961	.380
		N	385	385	385	385	385	385
	How long did you receive unemployment benefits?	Correlation Coefficient	-.011	.024	1.000	.001	.044	.023
		Sig. (2-tailed)	.827	.633	.	.984	.387	.657
		N	385	385	385	385	385	385
	How often do you think of leaving the organization?	Correlation Coefficient	-.060	.082	.001	1.000	.183**	-.049
		Sig. (2-tailed)	.237	.109	.984	.	<.001	.337
		N	385	385	385	385	385	385
	Is it very possible that you will look for a new job next year?	Correlation Coefficient	-.065	.003	.044	.183**	1.000	-.012
		Sig. (2-tailed)	.200	.961	.387	<.001	.	.814
		N	385	385	385	385	385	385
	If you could choose again, would you choose to work for the current?	Correlation Coefficient	.039	-.045	.023	-.049	-.012	1.000
		Sig. (2-tailed)	.443	.380	.657	.337	.814	.
		N	385	385	385	385	385	385

** Correlation is significant at the 0.01 level (2-tailed).

Spearman's correlation table shows there is very weak negative correlation (-0.079) between

annual income and unemployment benefits, suggesting this correlation is not statistically

significant ($p > 0.05$), and there is no strong evidence of a relationship between annual income and receiving unemployment benefits. Similarly, there is weak negative correlation (-0.011) between duration of unemployment benefits and annual income, suggesting there is no strong evidence of this correlation being statistically significant ($p > 0.05$). There is a weak positive correlation (0.024) between annual income and duration of unemployment benefits, suggesting this correlation is also not statistically significant ($p > 0.05$), indicating there is no evidence of a relationship between receiving unemployment benefits and the duration of those benefits.

Overall, the results of the Spearman's correlation coefficient test indicate that there is insufficient evidence to support the existence of a strong relationship between annual income and receiving unemployment benefits, as well as any

discernible impact on employees' turnover intentions.

Hypothesis 4: Job insecurity on Employees' Turnover Intentions

The job insecurity scale developed by Witte (1999), was used in this research to measure its impact on employees' turnover intentions. The categorical variables were given the same numerical values, from 1 = neutral, 2 = strongly disagree to 5 = strongly agree. Similar to work-life balance and employee compensation variables, the composite score of job insecurity was also calculated by adding up the mean ratings of all the participants and divided by three.

One -Way ANOVA

One-way ANOVA was used to analyze the impact of job insecurity on employees' turnover intentions.

Table 5
Hypothesis 4 - One-Way ANOVA

ANOVA

Turnover Intentions

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	14.082	12	1.173	2.104	.016
Within Groups	207.441	372	.558		
Total	221.523	384			

ANOVA Effect Sizes^{a,b}

		Point Estimate	95% Confidence Interval	
Turnover Intentions	Eta-squared	.064	.002	.086
	Epsilon-squared	.033	-.030	.056
	Omega-squared Fixed-effect	.033	-.030	.056
	Omega-squared Random-effect	.003	-.002	.005

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

b. Negative but less biased estimates are retained, not rounded to zero.

The ANOVA table illustrates there is a significant effect of job insecurity on turnover intentions. Specifically, the between-groups variation, which represents the differences in turnover intentions between the different levels of job insecurity, was found to be significant ($p = .016$).

The effect sizes estimated from the ANOVA analysis provide additional information about the

magnitude of the relationship between job insecurity and turnover intentions. Eta-squared, representing the proportion of variance in turnover intentions explained by job insecurity, was found to be .064. This means that 6.4% of the variation in turnover intentions can be attributed to job insecurity.

In summary, the one-way ANOVA test indicates that job insecurity has a significant

effect on turnover intentions, which suggests that the null hypothesis can be rejected.

Discussions/Implications

The findings of ANOVA revealed that work-life balance, employee compensation and job insecurity have significant impact on employee's turnover intentions, with enough evidence (p-value was less than 0.05) to reject the null hypothesis and accept the alternative hypothesis. However, government issued unemployment benefits did not show such results. T-test and Spearman's correlation results revealed no significant impact on employee's turnover intentions, suggesting that the null hypothesis cannot be rejected.

Work-Life Balance

The study revealed that with enough evidence from ANOVA (p-value being less than 0.05), the null hypothesis is rejected, indicating that work-life balance is a significant predictor of employees' turnover intentions. Similar results were found in Lestari and Margaretha (2020) and Fayyazi and Aslani (2015) studies that confirmed this statement that WLB has indeed, negative influence on employees' turnover intentions. These findings were consistent with Andrade et al. (2021); Liu et al. (2021) and (Vernekar & Heidari, 2019) particularly within the hospitality industry, that identified work-life conflict, working hours, low pay and low skill educational mismatch were key determinants affecting employees' job satisfaction and turnover intentions.

Employee Compensation

The study revealed employee compensation is also a significant predictor of employees' turnover intentions. The findings are consistent with previous studies (Das & Baruah, 2013); (Moncraz et al. 2009), that employee compensation is one of the most significant factors contributing to employees' decisions to quit their jobs. Besides monetary compensation, such as salaries and wages, career promotions,

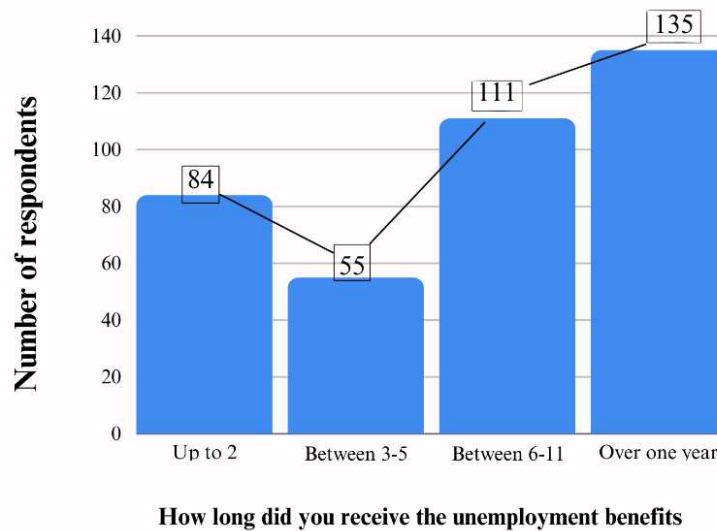
and job satisfaction, work environment rewards and recognition were also the leading factors that affected employee turnover (Milka et al., 2017). Empirical evidence confirmed hospitality employees' base earnings are not competitive compared to the other sectors of the economy (Jolly et al., 2021). This statement is in line with the research findings, especially when the respondents agreed that current compensation is not fair, and they are not satisfied with other incentives and benefits provided by their companies.

Unemployment Benefits

The sample T-test that was run to test the hypothesis: whether government issued unemployment benefits are significant predictors of employees' turnover intentions. As p-value was 0.836, there is no significant evidence to reject the null hypothesis, which indicates that the unemployment benefits do not have significant impact on employees' willingness to work. The results were consistent with Petrosky-Nadeau (2020), *who stated the value of a job, especially in a depressed labor market significantly outweighs the value of the temporary additional UI income. The findings were aligned with* Altonji et al., (2020); Finamor and Scott's (2020) and Ganong et al.'s (2020), who found there is no evidence that more generous benefits disincentivize employees from returning to work.

Even though Sample t-test and spearman's correlation test did not find any correlation between unemployment benefits and turnover intentions, there is still not enough evidence to say unemployment benefits did not affect employees' decisions to return to work, as the figure below shows that the majority of the respondents continued to receive unemployment benefits for over a year (see figure 1). It indicates that individuals were not returning to work as long as they were receiving unemployment benefits, because the main requirement of receiving unemployment benefits was to be unemployed.

Figure 1
Duration of unemployment benefits



Overall, it suggests that the availability of unemployment benefits might have influenced employees' decisions to delay their return to work. Therefore, further research is needed to gain a more conclusive understanding of the actual impact between unemployment benefits and employees' willingness to return to work in the post pandemic era.

Job Insecurity

Based on the ANOVA and symmetric measures results, the study found there to be enough evidence to reject the null hypothesis and accept the alternative hypothesis, indicating that job insecurity has significant impact on employees' turnover intentions. The findings were consistent with Jung et al. (2020); Elshaer and Azazz (2020); Chen et al. (2022), who confirmed when employees feel insecure about their jobs, it stimulates a new search for new job opportunities and increases the possibilities of turnover. Particularly, during the COVID-19 pandemic, the situation became aggravated, and employees' perceptions of job insecurity have increased because of organizational restructuring and scale-downs. This is true, as the majority of the participants whose employment status was affected by the state policies, responded 'agree' to the questions pertaining to job insecurity, such as: 'I feel insecure about my job' or 'in the near future, I think I may lose my job.'

Implications to Professional Practice

The research provided valuable insights concerning how the labor market is influenced by work-life balance, employee compensation and job insecurity in the post pandemic era. Even though the research did not find enough evidence to state the potential impact of unemployment benefits on employees' turnover intentions, however, there is an assumption that the availability of these factors may have delayed people from returning to work. Therefore, there are some practical implications that could be done among EDD professionals and employers to assist hospitality employees' transitions return to work from unemployment benefits. Employers and EDD professionals should monitor and evaluate the effectiveness of unemployment benefit programs during the pandemic and identify areas for improvement and make necessary adjustments. Additionally, EDD professionals can work closely with hospitality companies to offer targeted skill development programs that could align with the needs of the job market and help with the job placement services.

Recommendations for Future Research

Considering the 2023 data collection and 2020 benefit distribution gap, accurately assessing unemployment benefits' impact on employee's willingness to work was challenging. A longitudinal study is suggested to explore the

impact across pre, during and post-pandemic periods to enhance the understanding of the actual impact of these benefits on employees' behavior over time. The survey's limitations also hindered comprehending unemployment benefits' importance for work-related attitudes. Thus, a mixed-method approach is recommended for future studies, incorporating qualitative data to gain deeper insights into employees' perspectives of unemployment benefit's impact.

Conclusion

The study revealed important insights about the effects of work-life balance, employee compensation and job insecurity on the labor market in the post pandemic era. It provided enough evidence to affirm that work-life balance, job insecurity and employee compensation were the main stressors on employees' turnover intentions in the hospitality industry. These findings suggest that the hospitality companies need to address the underlying issues that causes labor shortages, and find ways to alleviate their working conditions, create better work environments with more flexibility and improved compensation systems to be able to retrain and attract new talented workers. The results provide valuable insights into these organizations and allow them to be more proactive with their hiring strategies.

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Exploring the Synergy between Financial Inclusion and Entrepreneurship Development - A comprehensive Analysis of the Indian Landscape

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Abstract

The present quantitative study intends to explore the relationship between financial inclusion and entrepreneurship development in India. Entrepreneurship development is essential for the economic growth of an economy. Financial inclusion by providing easy credit availability at affordable cost aids in entrepreneurship development. To measure the level of financial inclusion three basic parameters i.e., availability of banking services, penetration of banking services and usage of banking services is used. The level of entrepreneurship is measured through the number of new businesses registered per 1000 individuals of the age group 15 to 64. By employing multiple regression model, the study found a positive relationship between financial inclusion and entrepreneurship development in India. This finding underscores the significance of financial inclusion in not only aiding business initiation and expansion but also in catalysing job creation, boosting economic growth, and alleviating poverty.

Keywords: Financial Inclusion, entrepreneurship, GDP, economic growth, banking services

Introduction

Entrepreneurs often encounter significant challenges related to finances, as securing funding is a crucial hurdle in initiating and building their businesses (Onyekwelu *et al.*, 2023). Scholars emphasize the pivotal role of finance in determining the level of commitment and effort an entrepreneur allocates to their entrepreneurial endeavours (Claessens & Parroti, 2007; Goel & Madan, 2019). In response to this challenge, numerous developing nations have adopted financial inclusion as a strategy to promote entrepreneurial growth. This approach is not only advantageous for the formal economy but also facilitates the integration of rural residents into the informal sector. Financial exclusion hampers economic growth. As people who are outside the umbrella of the formal financial

system may take finance from the informal financial system at high cost or they may lose the opportunity to start or expand the business. Thus, financial inclusion directly serves the need of entrepreneurs by providing credit to entrepreneurs at an affordable cost. Access to banking services directly influences welfare (Nanda & Kaur, 2016). A country by increasing the level of financial inclusion may increase its economic growth, economic empowerment, and reduce the level of poverty (Fareed *et al.*, 2016; Sethi & Acharya., 2018; Inoue, 2019). An inclusive financial system boosts economic growth.

Financial inclusion means access to finance at an affordable cost in a timely manner and in an unbiased way. Financial inclusion represents a significant economic goal for numerous nations, especially those in the developing world, as research consistently indicates a direct correlation between financial

inclusion and poverty alleviation (Zogning, 2023). Government of India is continuously trying to provide financial inclusion as it spurs the economic growth rate. India is a fast-growing economy. Despite of continuous increase in GDP, rate of unemployment in country is alarming. Recent initiative of Government of India has shifted the focus from job seekers to job giver thus creating the ample opportunities for entrepreneurship in the economy. Financial inclusion not only aids in starting a business but also helps in improving the level of a business which leads to creation of jobs in economy, increase in economic growth rate and reduction in the level of poverty.

Sample literature is available to measure the level of financial inclusion. Many studies also establish the relationship between financial inclusion and economic growth but studies that focus on the linkage between financial inclusion and entrepreneurship development is in scanty (Fareed et al. 2017; Sethi and Acharya, 2018; and Innoue, 2019). The present study will add into literature the relationship between financial inclusion and entrepreneurship development in India.

The rest of the paper is organised as follows, section 2 covers relevant literature review, section 3 discusses the research methodology employed, section 4 deals with detailed analysis and interpretation and section 5 discusses the conclusion and recommendations.

Literature Review

Entrepreneurship development in an economy leads to its development. The Government of India is trying to make India job provider, not a job seeker. In this direction, several policies have been launched by the government of India starting from Pradhan Mantri Mudra Yojana (Bharti & Verma, 2023), Start-up India (Kalaivani et al; 2023), Make in India (Bishnoi, 2017). Developing nations consider financial inclusion as one of the main strategies to promote entrepreneurship development as financial inclusion provide access to basic financial services at an affordable cost and in an unbiased manner.

Level of Financial Inclusion

Financial inclusion is not a new phenomenon. Ample literature is available on measurement of level of financial inclusion. Leyton and Thrift (1995) found that every financial institution ascertains the cost of lending before lending, which usually remains

higher for meagre and underprivileged section of society. The study revealed that it is the nature of structural setup of the institutions that disfavours the lower income segment of society. Kempson and Whyley (1998) investigated various factors influencing the state of financial inclusion. The study discovered that when the formal zone failed to supply adequate services, the informal sector became active and fills this gap by supplying suitable and constant offering. Sarma (2008) calculated an Inclusive financial inclusion index for 100 countries for the year 2004. The study used three basic dimensions related to commercial banks to measure financial inclusion. The three dimensions used by Sarma to develop a financial inclusion index are: availability of banking services, penetration of banking services, and usage of banking services. The inclusive financial index for the India was 0.166 which was not good as compared to other economies. Kumar (2013) investigated the determinants of financial inclusion from 1995 to 2008. The study revealed the positive relationship between deposit and credit penetration. The study found a positive relationship in credit and deposit penetration. The study also revealed the negative impact of population on deposit penetration in India.

Financial inclusion and Entrepreneurship Development

Wang and Tan (2017) studied the impact of financial inclusion on development of farmers entrepreneurship. The study resulted in a positive relationship between the two. Fan and Zhang (2017) studied the impact of financial inclusion measures on entrepreneurship development in China from 2005 to 2014. By using data from 31 provinces and 19 industries, the study concluded the existence of a strong relationship between financial inclusion and entrepreneurship development. Financial inclusion by providing easy credit facility led to entrepreneurship development. Fareed et al. (2017) also found a positive relationship between financial inclusion and entrepreneurship development specifically in case of women entrepreneurs. Goel and Madan (2019) studied the impact of financial inclusion measures on development of women entrepreneurship in Uttarakhand in India. By conducting a primary survey, the study concluded a positive and significant impact of financial inclusion measure on development of women entrepreneurship in Uttarakhand. Jiang

et al. (2019) constructed a multidimensional financial inclusion index for China employing the data from 22 provinces and 4 municipalities from 2004 to 2017. Despite the huge inter provinces disparity in the level of financial inclusion, study concluded a positive and strong impact of financial inclusion on farmers entrepreneurship in China.

Methods and Materials

The present research employs a quantitative research design, utilizing secondary data analysis. It intends to explore the relationship between financial inclusion and entrepreneurship development in India. The data is analysed using the multiple regression model. This approach is suitable for this research question as it allows for the exploration of the impact of multiple financial inclusion indicators (number of bank branches, credit accounts, and credit as a percentage of GDP) on entrepreneurship development (measured by new firm registrations) in India. Multiple regression is well-suited for studying the relationships between multiple independent variables and a dependent variable. The use of a multiple regression model in this study is justified as it allows for a comprehensive analysis of how various measures of financial inclusion collectively impact entrepreneurship development in India. This methodology is particularly effective for handling multiple variables simultaneously and controlling for confounding factors, making it suitable for the study's quantitative, data-driven approach.

Choice of variables

Measurement of Financial Inclusion

Financial inclusion is measured through the number of bank branches for 10,000 individual number of credit accounts held by per 1000 individual, amount of credit as a percentage of GDP.

Measurement of entrepreneurship development

Entrepreneurship is measured by the registration of new firms for 1000 individuals in the country of the age group 15 to 64.

Sources of data

The data on the registration of new firms per 1000 individual among the age group 15 to 64 is taken from the World Bank entrepreneurship survey database. The data on financial inclusion indicators have been collected from the RBI website.

Model specifications

$$ED = \beta_0 + \beta_1 CBB + \beta_2 CA + \beta_3 CREDIT + \mu_i$$

Here, β_0 is intercept

ED is entrepreneurship development in India, CBB is number of bank branches for 10,000 individuals,

CA is number of credit accounts held by per 1000 individual,

CREDIT is amount of credit as a percentage of GDP,

μ_i is the error term

$\beta_1, \beta_2, \beta_3$ are coefficients of CBB, CA and CREDIT respectively.

Results and Discussions

Using the model development equation 1, we tried to explore the relationship between financial inclusion and entrepreneurship development in India. The study employed annual data from 2006 to 2018 from the World Bank database. Our dependent variable is entrepreneurship development which is measured through the registration of new firms for 1000 individuals among the age group 15 to 64. The level of financial inclusion is measured through the number of commercial bank branches for 10,000 individuals, the number of credit accounts per 1000 individuals, the amount of credit disbursed as a percentage of GDP. Table 1 shows the results of the impact of financial inclusion on entrepreneurship development in India.

Table 1 shows the results of the overall model. The probability value of f statistics shows a positive association between financial inclusion and entrepreneurship development. Thus, indicating the level of financial inclusion in a country promote entrepreneurship development in a nation. The value of R square is 69.76 indicating a good model fit.

Table 1
Model Summary

Variable	Coefficient	Std. error	T statistics	Prob
C	0.171848	0.215968	0.795	0.4623
CA	0.001495	0.000644	2.321	0.0679
CBB	0.012470	0.005627	2.216	0.0775
CREDIT	0.131494	0.376709	0.349	0.0413
R Squared	0.795			
Adjusted R square	0.891			
S.E of regression	3.845			
Sum squared resid	0.000			
Log-likelihood	1.899			
F Statistic	13.749			
Prob (F-Statistic)				
Prob(Wald F-Stastic)				

Note: Authors' Calculation

Table 1 presents the model summary and shows the impact of financial inclusion on entrepreneurship in India, using data from 2006 to 2018. The model summary includes key statistical measures that indicate the strength and validity of the regression model used. The table indicates a positive association between financial inclusion and entrepreneurship development, with an R-squared value of

69.76, suggesting a strong explanatory power of the model.

Test of Goodness of Fit

In order to further strengthen our results, some tests are performed to check the robustness of model. The results of diagnostic check are shown in Table 2-4. All results show our model is free from any defect.

Test of Heteroskedasticity

Table 2
Results of Breusch-Pagan-Godfrey Heteroskedasticity

F-statistic	0.596088	Prob. F (3,5)	0.6445
Obs* R ²	2.370913	Prob. χ^2 (3)	0.4991

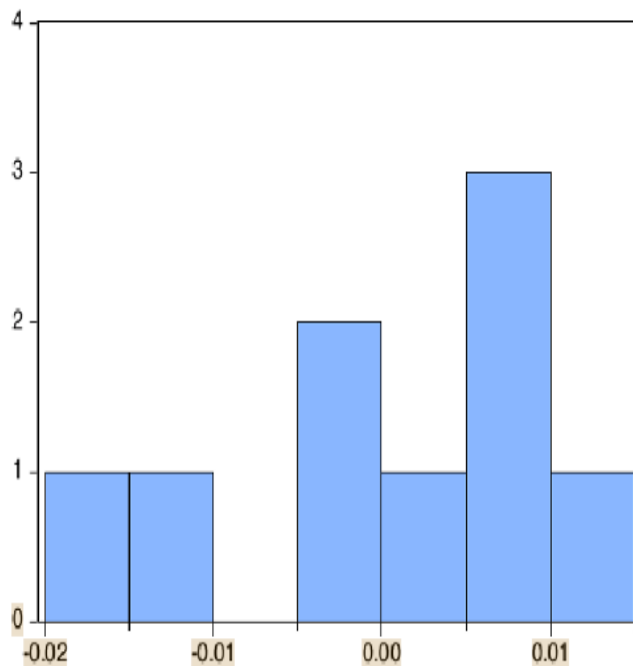
Note: Author's calculation

Table 2 presents results of various diagnostic checks, including the Breusch-Pagan-Godfrey test, to ensure the robustness of the regression model. This table is key in demonstrating that the model is free from common issues like heteroskedasticity (unequal variance of residuals), serial

correlation (autocorrelation), and non-normality of residuals. The Breusch-Pagan-Godfrey test, specifically, is used to detect heteroskedasticity in regression models. Its inclusion in Table 2 helps to validate that the error terms in the model have a constant variance, which is essential for reliable regression analysis.

Test of Normality

Figure 1
Normality Test



Series: Residuals

Sample: 2010-2018

Observations: 9

Mean	2.93e-17
Median	0.001333
Maximum	0.010683
Minimum	-0.016009
Std. Deviation	0.009262
Skewness	-0.592020
Kurtosis	2.096457
Jarque-Bera	0.831879

Figure 1 presents the results of the test of normality for the residuals of the study regression models. It covers a sample period from 2010 to 2018 with 9 observations. The figure includes various statistical measures such as mean (2.93e-17), median (0.001333), maximum (0.010683), minimum (-0.016009),

standard deviation (0.009262), skewness (-0.592020), kurtosis (2.096457), and the Jarque-Bera statistic (0.831879). These measures are essential for assessing the normality of the residuals in the regression models used in the study.

Test of Serial Correlation

Table 3
Results of Breusch-Godfrey Serial Correlation LM Test

F-statistic	0.446182	Prob. F (2,3)	0.6766
Obs*R ²	2.063341	Prob. χ^2 (2)	0.3564

Test of Autocorrelation

Table 4
Correlogram of Residuals

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.065	-0.065	0.0526	0.819
		2	-0.438	-0.444	2.7625	0.251

Source: Author's Calculation

Tables 3 and 4 contain results of diagnostic checks for the model, including tests for heteroskedasticity, serial correlation, and normality of residuals. These checks confirm the model's robustness and reliability, ensuring its validity for the study.

Conclusion and Recommendation

The study established a positive association between financial inclusion and entrepreneurship development in India. By employing annual data from the World Bank database, a multiple linear regression model was applied to test this assumption. Finance is a major requirement to start a business, and financial inclusion, by providing credit facilities to people, and that too at an affordable cost, helps to remove the financial hindrance in entrepreneurship development. The study provides useful insights for developing policies to infuse credit into the economy to promote entrepreneurship. However, this study has several limitations. Firstly, it employs a small sample due to the availability of data. The results could be better if a longer period is involved. Additionally, the present study measures financial inclusion in terms of the number of branches, the number of credit accounts, and the usage of credit facilities by commercial banks only. The results suggest that enhanced access to banking services significantly contributes to entrepreneurship development, emphasizing the role of financial inclusion as a catalyst for economic growth and job creation.

Limitations

Despite its robust insights, the study is limited by its reliance on commercial banking metrics and a specific timeframe, suggesting the potential for more comprehensive future research incorporating a broader range of financial institutions and a more extended period. The multiple regression model used may not capture all the nuances of the relationship between financial inclusion and entrepreneurship development. The primary shortcoming of this research lies in its data scope and variable range, impacting the findings' generalizability and completeness. The limited availability of data leading to a relatively small sample size, covering a specific period, restricts the robustness and broader applicability of the results. Additionally, the study's focus on commercial banking metrics (like number of branches, credit accounts, and credit usage) for measuring financial inclusion

overlooks other significant financial channels such as post offices, microfinance institutions, and self-help groups, especially crucial in rural and semi-urban areas. This narrow focus potentially results in an incomplete picture of the financial inclusion landscape and its true impact on entrepreneurship development, indicating the need for further research with a broader dataset and a more diverse range of financial inclusion indicators to enhance the study's findings.

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Resilience and Responsiveness in the Logistics Industry during Disruptive Events: A Case Study on the Impact of the Coronavirus Pandemic

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Abstract

Understanding operational resilience during disruptive events is critical in the dynamic global logistics field. This qualitative study explores the challenges faced by a logistics company during the COVID-19 pandemic based on surveys and interviews with twelve logistics management experts. A thematic analysis was used to identify recurring themes regarding logistics disruptions and response strategies. The data revealed internal disruptions such as delays in pickup or delivery, inaccurate delivery information, and communication challenges with drivers. External disruptions include supply-demand imbalances, freight rate volatility, port congestion, and unexpected supplier shutdowns. Strategies to enhance logistics resilience are discussed, emphasizing strategic decision-making, robust leadership, digitalization for improved communication and supply chain visibility, and agility in adapting to change. These findings provide a thorough understanding of logistics disruptions and offer practical recommendations for professionals to navigate challenges and strengthen their logistics operations.

Keywords: Logistics operations, disruptive events, coronavirus pandemic, risk management, contingency planning, digitization, case study

Introduction

Logistics, an essential driver of international trade, involves the intricate movement and storage of products from their point of origin to the end consumers (Baker et al., 2023). However, the complexity of these operations makes them vulnerable to a myriad of disturbances, emphasizing the critical need for resilience and the ability to foresee, navigate, recover, and adapt to such interruptions (Ivanov & Dolgui, 2020). The COVID-19 pandemic, a monumental disruption, profoundly affected the global logistics sector. It notably strained supply chains and had a pronounced effect on significant manufacturing centers, especially China (Garrido et al., 2020; Ali et al., 2021).

This study explores how a logistics company navigates multidimensional disruptions triggered by the pandemic. It examines the risk management paradigms adopted to build

resilience during turbulence. The overall aim is to provide an in-depth qualitative account of the challenges encountered and the adaptive strategies deployed concurrently from the perspective of logistics professionals. The following sections present a review of the literature on risk management and resilience in logistics, followed by the conceptual framework, methodological details, results, discussion, and implications of the findings.

Review of the Literature

The coronavirus pandemic has underscored the need for resilience and responsiveness in supply chain logistics, especially during disruptive and uncertain events. Recent studies have provided valuable insights into risk management and contingency planning from localized and widespread crisis perspectives (Choi, 2020; Ivanov, 2022b). Ivanov et al.'s model

integrating agility, resilience, and sustainability offers a promising holistic framework for navigating major disruptions, such as the pandemic (Ivanov, 2022a, 2022b; Ivanov & Dolgui, 2020). This holistic framework is critical for supply chain strategies. However, gaps exist in the granularity of analysis in assessing risks and developing robust contingency plans (de Matta, 2017; Sheth, 2020), highlighting the need for further research to develop more detailed risk assessment and contingency planning frameworks.

Communicating openly and maintaining transparency with stakeholders has also been emphasized as a vital principle during turbulent periods (Onica et al., 2022; Parajuli et al., 2017). Adopting a wider open communication approach could significantly improve supply chain resilience. Nagao et al. (2021) highlighted robustness through supplier diversification as a prudent strategic imperative to withstand disruptions (Nagao et al., 2021). Diversification has emerged as a key tactic in the literature. The pandemic has underscored contingency planning's indispensability, especially in dense urban centers (Gazze et al., 2022). The emphasis on contingency planning is unsurprising but illustrates the supply chain vulnerabilities have been exposed. Innovative logistics strategies during crises could transform supply chain logistics into an essential mechanism amid turbulence (Choi, 2020). Adaptability and innovation appear to be recurrent themes in many of these studies.

The digital transformation of the postpandemic supply chain has received significant attention (Chauhan et al., 2023), and structured digital approaches have been proposed to mitigate disruptions (Queiroz et al., 2022). Supplier diversification and transparency have emerged as prominent themes (Kiers et al., 2022; Wijewickrama et al., 2022). Agile and adaptable recovery paradigms tailored for manufacturing supply chains have also been devised (Paul & Chowdhury, 2020, 2021). Postpandemic resilience has necessitated a shift from cost-focused to resilience-oriented supply chain frameworks (Kiers et al., 2022; Lopes et al., 2022). This shift is inevitable and overdue. Tailored flexible systems represent methods likely to be utilized in the future, and it is vital to address technological, regulatory, and market

challenges to ensure the agility and flexibility of supply chains (Klein et al., 2022; Nagao et al., 2021). This underscores the need for a holistic perspective that encompasses all aspects of the supply chain environment.

Overall, the literature has focused more on localized disruptions (A. Garrido et al., 2020; Butt, 2021) and technological innovation (Fathollahi-Fard et al., 2022; Klaus & Manthiou, 2020). There appears to be a gap in research on risk-management paradigms adept at navigating large-scale disruptions in post-pandemic contexts (Fathollahi-Fard et al., 2022; Gazze et al., 2022; Ivanov, 2022a, 2022b; Sun & Zhang, 2022; Szuster & Lotko, 2022).

Present Study

The literature has focused extensively on localized supply chain disruptions and technological innovations. However, there is a gap in the research on risk management paradigms to navigate widespread crises in post-pandemic contexts. This study addresses this gap by examining how a logistics company manages multidimensional disruptions triggered by the COVID-19 pandemic. The granular single-case analysis is expected to provide invaluable qualitative evidence revealing the nuanced internal and external disruptions faced, along with the tailored resilience strategies deployed concurrently. Notably, while the findings of a single case analysis are limited in generalizability, they offer rare empirical insights into pragmatic risk management practices during a major disruption event (Kumar & Sharma, 2021; Shen & Sun, 2023).

The primary objective of this qualitative study is to examine the operational challenges faced by a logistics company in California, United States, due to the COVID-19 pandemic. Furthermore, this study identifies the most significant disruptions in the logistics sector and assesses possible countermeasures to counteract such disruptions. This study focused on the following research questions:

RQ1: How does a global disruption event, such as a pandemic, challenge logistics operations' ability to reassess standardized risk management plans?

RQ2: What strategies or contingency plans can help organizations better prepare for current

and future logistics disruptions on both short- and long-term bases?

RQ3: What factors or risk management strategies prompt business leaders to adapt by altering their products or services during a pandemic?

Conceptual Framework

This study adopted a conceptual framework to examine the impact of disruptive events, such as COVID-19, on logistics resilience. The multidimensional framework encompasses four key domains: risk assessment, information management, operational procedures, and strategic policies. Risk assessment involves the

evaluation of vulnerabilities across ports, transportation, inventory, technology, and other parameters (Figure 1). Information management focuses on enabling seamless data exchange through digitization. Operational procedures entail streamlining supply chain processes to enhance responsiveness. Strategic Policy provides leadership to champion a resilience-oriented vision and culture across the organization. The complementary elements of the framework consist of proactive contingency planning, dynamic resource allocation, developing crisis leadership capability, digital adoption, and implementing best practices.

Figure 1
Conceptual Framework



Note: The multidimensional framework for risk assessment in logistics and supply chain management is illustrated. This framework comprises four principal domains: risk assessment, information management, operational procedures, and strategic policies.

Methods and Materials

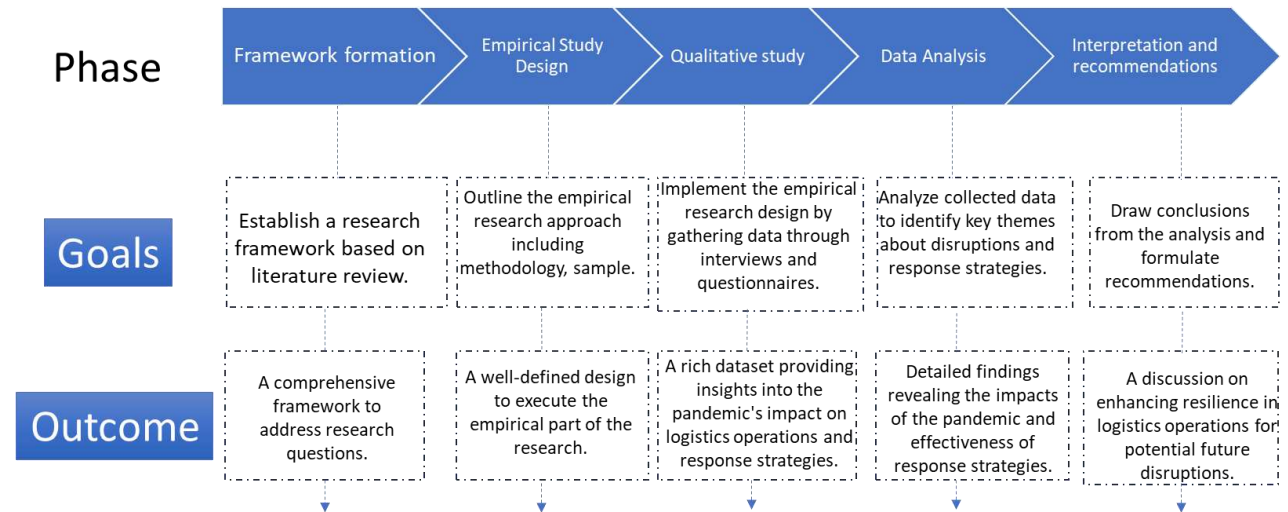
A qualitative methodology involving semi-structured interviews and surveys was used. A mid-startup logistics organization in California, United States, served as the primary unit of analysis. Using objective sampling in a cyclical process, participants were selected based on

specific characteristics to ensure a diverse and representative sample (Etikan, 2016). Qualitative methods allow for an in-depth exploration of participants' perspectives and experiences, which suits the goal of understanding logistics disruptions and responses during an unprecedented event, such as the COVID-19

pandemic (Paul & Chowdhury, 2020). Expert sampling further enriched the study by targeting people with deep logistics expertise to gain insight into challenges, successes, failures, and emerging trends (Wieland, 2021). The selection

criteria encompassed years of experience, management level, and direct involvement in the phenomenon under investigation. The study began by developing a conceptual framework followed by an empirical study design (Figure 2).

Figure 2
Phases of the Study



Note: The figure presents different phases involved in the study. These stages include the design and planning of the study, the collection and analysis of data, and finally, the interpretation and reporting of the findings.

Participants and Data Saturation

The sampling cycle culminated in the selection of twelve participants for the virtual interviews (see Appendix A1). Adhering to the qualitative research guidelines proposed by Francis et al. (2010), a sample size of seven to 12 interviews was deemed sufficient for

comprehensive data understanding (Francis et al., 2010). At the 10th interview, data saturation was evident, with recurring themes and no new insights emerging. The inclusion criteria and detailed profiles of the participants are presented in Table 2.

Table 1
Inclusion Criteria and Description

Criteria	Description
Professional experience	Participants must have a minimum of ten years of experience in managing logistics operations. This criterion ensures the depth of practical knowledge and understanding in the field.
Position in the firm	Participants should be in a senior executive role within their company. This ensures that they have a comprehensive overview and decision-making power in logistics operations.
Involvement	It is essential for participants to have direct involvement in overseeing one or more of their organization's logistics operations. This involvement guarantees first-hand experience and knowledge relevant to the study.

Note. These criteria are designed to ensure that participants have sufficient professional experience and hold a significant position within their organization.

Table 2
Participants' Profile

Participants	Job Title	Experience (Years)	Interview Duration (Min)
P1	Senior Accounts Receivable Manager	5	29
P2	Senior Yard Manager	6	26
P3	Dispatch Manager	5	29
P4	Director of Operations	8	31
P5	Senior Operations Manager	5.5	32
P6	Vice President of Operations	9.5	26
P7	Senior Corporate Accounting Manager	6	23
P8	Senior Pricing Analyst	7	24
P9	Customer Success Supervisor	4.5	19
P10	Product Marketing Manager	5.5	32
P11	Director, Transportation Engineering Systems	10	24
P12	Chief Product Officer	12	25

Note. This table presents a detailed profile of the participants involved in the study. It includes their job titles, years of experience in their respective fields, and the duration of their interviews.

Participant Selection and Interview Process

Twelve experienced professionals who held authoritative roles within the selected logistics firm were chosen as interviewees. The semi-structured interview format consisted of open-ended questions to prompt discussion and to cover key topics related to the research questions. This interview structure enabled the participants to share insights based on their experiences.

Expert interviews and surveys were conducted remotely from 2023, January through February, under coronavirus guidelines. Once participants consented to participate, they received a virtual meeting link, an informed consent form, and the interview protocol. All interviews were recorded with strict adherence to anonymity guidelines. The interview structure encompassed participant and organizational information, logistics disruptions, remedial action plans, logistics resilience, risk management, and contingency operations.

Structured Survey

In addition to the interviews, a structured survey consisting of closed-ended questions was distributed to additional logistics professionals. The survey gathered quantifiable data to complement qualitative interview findings. The goal was to collect more than 10 valid responses, targeting an 80% response rate for robust analysis.

Reflexive Thematic Analysis

Reflexive thematic analysis (TA) was used to systematically identify, organize, and offer insights into patterns of meaning (themes) across the qualitative dataset. This method provides a flexible yet robust framework for coding and deriving themes from the interviews and survey data. The analyses were performed manually by the researcher. Rigor was ensured by following the reflexive TA process outlined by Braun and Clarke (2021)

1. Familiarization: The data were read repeatedly to achieve immersion and to obtain a sense of breadth and depth. Detailed notes were obtained from the first impressions.

2. Coding: Initial codes were generated by systematically identifying and labeling the meaningful features of the data across the entire dataset. Coding was performed manually by highlighting and annotating the transcripts.

3. Search for themes: Codes were analyzed and collated into candidate themes and subthemes based on patterned meanings. The themes were reviewed for coherence, consistency, and distinctiveness.

4. Defining and naming themes: Themes were defined and refined to determine the essence of each theme captured. Clear names were assigned.

5. Reporting: The themes were summarized in the results section using vivid

examples from the data. Frequency counts were used for additional quantification.

Coded data extracts were analyzed to identify overarching themes. The candidate themes were reviewed for coherence and distinctiveness. Subthemes were identified within broader themes to showcase nuances and depths. The themes were then defined, named, and finalized based on their significance and relevance to the research questions. These strategies enhanced the trustworthiness of the analysis. Frequency counts quantified the occurrence of themes and subthemes. The iterative TA process allowed robust themes to emerge inductively from the qualitative data. To validate the findings further, colleague collaboration and member checking were conducted. The iterative analysis elicited robust inductive themes rooted in the experiences articulated in raw qualitative data. This rigorous process allowed the systematic identification and in-depth exploration of patterns of meaning in logistics resilience strategies during a major disruption event. Four principles are followed to establish trustworthiness: credibility, dependability, conformability, and transferability (Ryan et al., 2022).

Results

Table 2 offers a comprehensive overview of the participants' profiles, detailing their job titles, years of experience, and duration of their interviews. The participants spanned a range of roles within the logistics organization, from senior accounts receivable managers to chief product officers. Their experience in the field varied, with tenures ranging from 4.5 to 12 years. On average, each interview lasted approximately 25 min, accumulating 320 min (5.3 h) of audio. The extensive audio content was transcribed into 66 pages of text, meticulously reviewed, and corrected for accuracy.

Thematic Analysis

Three themes emerged from the data analysis: internal logistics disruptions, external logistics disruptions, and recommended contingency response strategies. These themes were based on the frequency table (see Appendix A2), which recorded the number of times the participants mentioned a specific code.

Internal Logistics Disruptions

Delays in pickup or delivery were mentioned by 66.7% of participants (see Appendix A3). Delayed or inaccurate delivery information is highlighted at the 50% level. Communication challenges between the organization and drivers were noted by 50% of the participants. Inadequate information sharing within the company was a concern for 58.3% of participants.

External Logistics Disruptions

Imbalanced supply and demand were mentioned by 100% of participants (see Appendix A4). The volatility of freight rates was a concern at 33.3%, while conjunction at ports and delayed shipments was noted at 75%. Unexpected or unplanned supplier shutdowns were highlighted by 50% of participants, and increasing regulatory burdens were mentioned by all participants.

Recommended Contingency Response Strategies

Participants proposed strategies to counteract the effects of pandemic-induced challenges. Resource planning throughout logistics operations was mentioned by 58.3% of participants. Amplifying digital communication within the supply chain network was highlighted by 41.7%. Long-term strategic planning was advocated by 66.7% of the participants. Decisive leadership and strategic decision-making were underscored by 66.7%, while organizational adaptability and resilience were recommended by 50% of the participants. Establishing a rapid response mandate was emphasized by 41.7% of the participants.

Discussion/Implications

This qualitative study examined how a logistics company navigated the multifaceted disruptions triggered by the COVID-19 pandemic. Rigorous thematic analysis of the direct participant accounts uncovered two central themes: internal and external disruptions. Internally, delays, inaccurate data, communication gaps, and information constraints affect operational coordination and service delivery. Disruptions such as demand-supply volatility, freight fluctuations, port congestion, supplier breakdowns, and regulatory changes emanate from the business ecosystem. A key

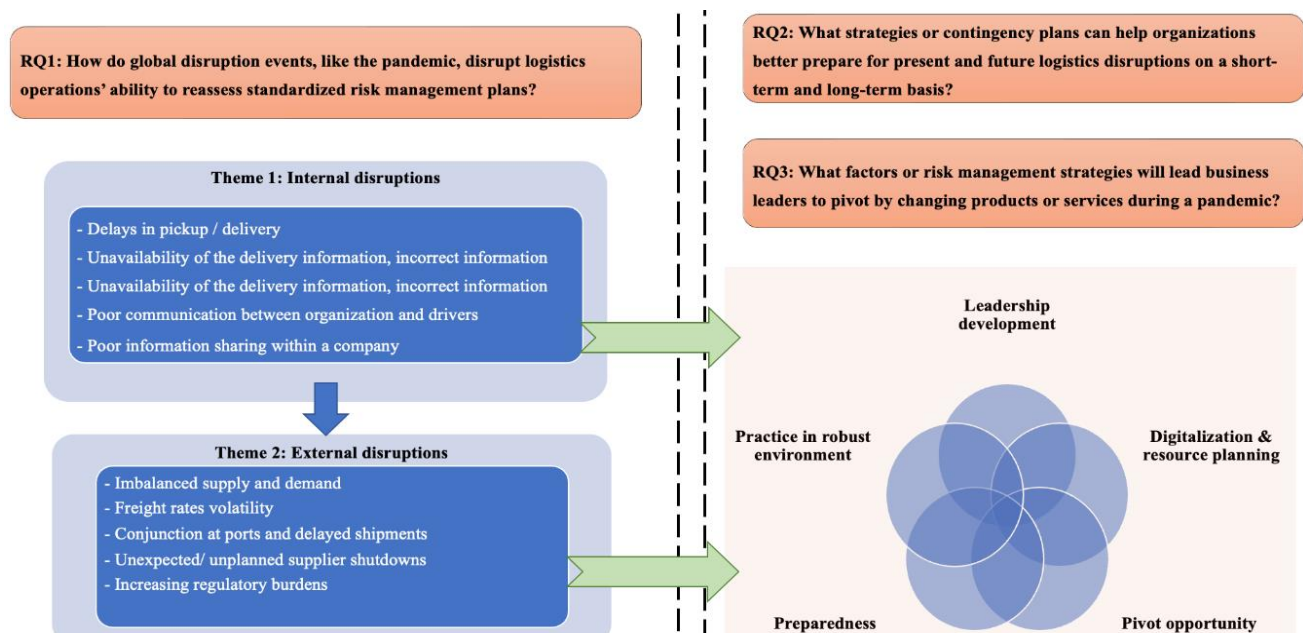
finding is the interdependence between these disruption dimensions, with external forces seriously exacerbating internal challenges. This interplay highlights the complex and interconnected nature of logistics disruption.

To counteract these disruptions, five key response strategies were proposed: resource optimization, digital integration, visionary planning, leadership development, and organizational adaptability. Optimizing resources by enhancing fleet management and warehousing can improve resilience during shortages induced by external disruptions (Ivanov, 2022a). Digital integration creates transparency, enables coordination with suppliers, provides customer access and heightens responsiveness (Chauhan et al., 2023). Forward-thinking strategies that harmonize current capabilities and future goals are vital for preparedness and continued relevance in shifting landscapes (Baker et al., 2023). Decisive leadership and adaptability facilitate rapid sensemaking and maneuverability when unexpected situations arise (Nagao et al., 2021). Ultimately, these strategies coalesce to engender organizational resilience, defined as the capacity to foresee potential disruptions, withstand their impacts, recover normal

functioning, and adapt to new realities (Lopes et al., 2022).

The study's central research question (RQ1) examined the significant disruptions faced by a logistics firm in California during the coronavirus pandemic. The thematic analysis revealed many challenges, as shown in Figure 3. Internally, delays in pickup and delivery, data inaccuracies, communication gaps, and limited information exchange posed challenges. Imbalanced supply demand, freight volatility, port congestion, supplier breakdowns, and regulatory shifts disrupt operations. Subsequent questions (RQ2 and RQ3) explored the potential response strategies. Five key tactics have emerged: optimizing resources, digital integration, visionary planning, leadership development, and organizational adaptability. These strategies offer actionable insights for logistics entities that are struggling with pandemic disruptions. They also reinforce the existing research on effective contingency planning under turbulence (Wieland, 2021). Blending current capabilities with future outlooks, training adaptable leaders, leveraging technology, and enhancing flexibility enables logistics organizations to withstand, recover, and thrive despite disruptions.

Figure 3
Summary of Disruption Themes and Response Strategies



Note: This visual summary categorizes disruptions that can occur within a specified context, outlining the main themes under which these disruptions fall

The study reinforces the core premise of resilience theory, advocating developmental strategies to handle disruptions effectively (Fonseca & Azevedo, 2020; Ivanov, 2022a; Strielkowski et al., 2022; Vainauskienė & Vaitkienė, 2022). Leadership training, technology adoption, optimization, and proactive preparation offer a blueprint for logistics entities to navigate disruptions adeptly (Baker et al., 2023). While a single case study limits generalizability, this study provides invaluable empirical evidence on real-world resilience strategies during global disruptions, which are underinvestigated in the current literature (Kumar & Sharma, 2021; Shen & Sun, 2023). These findings provide several valuable contributions to the literature. A granular examination of a logistics organization's pandemic response provides a framework for categorizing internal and external disruptions. This structure can serve as a foundation for future research to explore specific subthemes in greater depth and to elucidate implications for logistics management. Additionally, the study aimed to expand knowledge on effective crisis response strategies, although further inquiry into resilience factors and best practices is warranted.

Although these findings are significant, it is essential to recognize that this study had certain limitations. While this work offers qualitative insights into disruptions, large-scale quantitative studies complement the understanding of disruption magnitudes and generalizability. The limited availability of related literature also poses challenges for contextualizing findings within current knowledge.

Conclusion

This qualitative study identifies key elements for effective crisis management, including adaptability, flexibility, communication, collaboration, leadership, and the use of technology. By concurrently focusing on developing leadership, digitizing processes, streamlining inventory, warehousing, and delivery, logistics companies can respond rapidly to disruptions and minimize adverse impacts. This study also demonstrates how structural weaknesses can cascade into acute crises during unexpected events. Proactive mitigation of these deficiencies, even during stability, is essential for resilience. These findings provide a framework for systematically assessing and addressing

vulnerabilities across strategic and operational dimensions during crises. By prioritizing operational improvements and addressing each phase of strategic and operational processes, logistics organizations can better prepare for and respond to disruptions.

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Appendix A
Interview, Participants' Profile and Responses

Table A1

Methodology Employed for Conducting the Semi-structured Individual In-depth Interviews

#	Steps
1	Interviews were conducted over 25-30 minutes, and the entire research process spanned three months, allowing for in-depth exploration of topics.
2	Each interview involved a dyad of one participant and one researcher, ensuring focused and personalized interaction. The sample included 12 experts, providing a broad range of perspectives.
3	Interviews took place during the context analysis and risk management strategies phase of the study, focusing on contingency planning and restructuring in a logistics company.
4	Essential infrastructure for the interviews included an audio recorder, a notebook, a pencil, a separate room for privacy, and a computer for data management.
5	The research tool employed was a scenario-based approach, facilitating detailed discussion and analysis.
6	The primary objective was to gather individual opinions on the current state of the pandemic, providing contemporary and relevant insights.

Note. Semi-structured individual in-depth interview formation

Table A2*Themes Identified in the Study, Classified by the Nature and the Frequency*

Code	Theme Classification	P 1	P 2	P 3	P 4	P 5	P 6	P 7	P 8	P 9	P1 0	P1 1	P1 2	Total
Imbalanced supply and demand	External disruption	1	1	1	1	1	1	1	1	1	1	1	1	12
Conjunction at ports and delayed shipments	External disruption	1	0	1	1	1	0	1	1	0	1	1	1	9
Leadership development	Response strategy	0	1	1	1	0	1	1	0	1	0	1	1	8
Poor communication between organization and drivers	Internal disruption	1	0	1	1	0	1	0	1	0	1	1	1	8
Digitalization and resource planning	Response strategy	1	1	0	1	0	1	1	1	0	1	0	0	7
Poor information sharing within a company	Internal disruption	0	1	1	0	1	1	0	1	0	1	0	1	7
Unexpected/unplanned supplier shutdowns	External disruption	1	0	0	1	1	0	0	1	0	1	0	1	6
Pivot opportunity	Response strategy	1	0	1	0	1	0	0	1	0	1	1	0	6
Delays in pickup/delivery	Internal disruption	1	0	0	0	1	1	0	1	0	1	0	1	6
Unavailability of delivery information, incorrect information	Internal disruption	1	0	0	0	1	1	1	0	0	1	1	0	6
Increasing regulatory burdens	External disruption	0	1	0	1	0	1	1	0	0	0	1	0	5
Preparedness	Response strategy	1	0	0	0	1	0	1	0	0	1	1	0	5
Practice in a robust environment	Response strategy	0	1	1	0	0	1	0	1	1	0	0	0	5
Freight rates volatility	External disruption	1	0	0	0	0	1							

Note. Frequency of each code mentioned by participants.

Table A3*List of Various Internal Logistics Disruptions Identified in the Organization*

Internal Logistics Disruptions in the Organization	Participants' Opinions
Damages due to accidents/improper stacking	Not at all
Improper packaging and material details	Not at all
Processing errors (e.g., lost or missing freight)	Not at all
Breakdown of internal/external IT system	Seldom
Poor security of information system	Seldom
Inadequate operational strength (e.g., delivery capacity, poor fleet)	Slightly
Storage issues	Slightly
Poor design of the company's transportation network	Slightly
Breakdown of equipment (e.g., machine failure or truck not working)	Slightly
Information confusion	Slightly
Delays in pickup/delivery	Sometimes
Lack of timely and accurate delivery information (such as delivery location and time) and the provision of incorrect details, such as the receiver's name, address, time, and quotations	Sometimes
Poor communication between the organization and drivers	Sometimes
Poor information sharing within a company	Sometimes

Note. Codes per Participants' Opinions for Internal Logistics Disruptions (Theme One)

Table A4*External Logistics Disruptions as Identified by the Participants.*

External Logistics Disruptions	Participants' Opinions
Damages due to customer's fault (e.g., prohibited items)	Never
Customer refusing freight charges	Often
Customer changing the preference	Often
Inaccurate forecast of customer's freight volume	Often
Higher customer expectation (e.g., misunderstanding of transit time)	Often
Unstable fuel prices	Often
Delay due to customers' mistakes (e.g., incorrect paperwork)	Seldom
Complexity process (e.g., international, dangerous goods, special goods)	Seldom
Road conjunction or closures	Seldom
Weather or natural disasters (e.g., flood, bushfire)	Seldom
Industrial actions (e.g., strikes)	Seldom
Uncertainty due to government's law or regulations (e.g., import fee increased)	Seldom
Poor communication between a customer and a company	Sometimes
Driver shortage	Sometimes
Imbalanced supply and demand	Very often
Freight rates volatility	Very often
Conjunction at ports and delayed shipments	Very often
Unexpected/unplanned supplier shutdowns	Very often
Increasing regulatory burdens	Very often

Note. Codes per Participants' Opinions for External Logistics Disruptions (Theme Two)