Driving Blockchain Adoption in Small and Medium Enterprise Sector: Introducing the Concept of “Transformation Conditions”

Helen Shun-mun WONG , Carmen Ka-man SUM * , Hau-ling CHAN

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Article

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Helen Shun-mun WONG, Carmen Ka-man SUM * and Hau-ling CHAN

School of Professional Education and Executive Development, The Hong Kong Polytechnic University, Hong Kong; helen.wong@cpce-polyu.edu.hk; https://orcid.org/0000-0001-9940-4248
College of Professional and Continuing Education, The Hong Kong Polytechnic University, Hong Kong; carmen.sum@cpce-polyu.edu.hk, https://orcid.org/0000-0003-2393-655X
School of Fashion and Textiles, The Hong Kong Polytechnic University, Hong Kong; hauling.chan@polyu.edu.hk, https://orcid.org/0000-0002-2531-3084
* Correspondence: carmen.sum@cpce-polyu.edu.hk

Abstract: Blockchain technology (BCT) has the potential for sustainable development, enhancing business efficiency, reducing costs, and strengthening data security. Despite its potential, adoption among small and medium-sized enterprises (SMEs) is low due to the need for significant changes in technology infrastructure and the challenge of interoperability. A cross-sectional survey was done with 226 Hong Kong SMEs. The PLS-SEM results highlighted favorable transformation conditions as the most critical factor for SMEs considering the adoption of BCT. These conditions address both internal and external readiness for adopting the disruptive strategy. Other contributing factors to BCT adoption include trust in BCT developers, perceived usefulness and ease of use, government support, and perceived security. The research results contributed to the literature on disruptive technology acceptance, adoption, transformation conditions, technology readiness, and SMEs' technology adoption. Government-supported policies and initiatives can promote BCT adoption, including educational programs, case studies, and resources for readiness. Financial support and regulatory frameworks can further encourage adoption. BCT developers can demonstrate the value of their systems, effectively communicate potential ROI and cost savings, and provide user-friendly interfaces to increase SMEs' intention to adopt BCT.

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1. Introduction

Blockchain technology (BCT) is a distributed ledger technology (DLT) providing decentralized, secure, immutable, verifiable, and transparent solutions to manage data across parties. Adopting BCT can eliminate intermediaries and enhance a greater level of trust for all involved parties. It has the potential to enhance business efficiency, reduce operational costs, strengthen data security, and stay competitive in the market (IBM, n.d.; Wahyuni & Juraida, 2022). It is famous for its cryptocurrency feature, but its applications go beyond that and contribute to a wide range of industries, including real estate, banking and finance, legal, logistics and supply chain management, and healthcare (Pu & Lam, 2020). The emergence of green blockchains not only enhances their value to adopters in terms of operational efficiency and profitability but also contributes to sustainability and the reduction of carbon emissions (What Is a Green Blockchain? Eco-Friendly Tech, n.d.).

The United Nations (UN) has acknowledged the potential of BCT in achieving sustainable global development (The United Nations, n.d.). Despite the lack of critical mass to make definitive conclusions about its usability and relevance, BCT is regarded as a promising technology. Applications of BCT are currently experimental within the UN system, and further exploration of

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BCT is encouraged. For example, cryptocurrencies and BCT-based tokens allow trading and transactions among the world's unbanked population of two billion. This BCT application can disrupt the global remittance market and alleviate the burden of migration, contributing to the UN Sustainable Development Goal 1 (PA Consulting, 2023). BCT can also ensure robust provenance throughout supply chains with its tracing and tracking features. It can contribute to responsible production and consumption, aligning with UN Sustainable Development Goals 12, 14, and 15 (PA Consulting, 2023).

The potential and value of BCT for sustainable development are promising. There is substantial evidence suggesting that adopting disruptive technologies like BCT can enhance an enterprise's competitive edge, particularly for small and medium enterprises (Saebi et al., 2019; Sharma et al., 2022). BCT and similar disruptive technologies have led to revolutionary business models that alter current practices, processes, strategies, and operations. A comprehensive reevaluation is called for after the COVID-19 pandemic, leading to a new line of research to identify new approaches using disruptive technologies for SMEs (Sharma et al., 2022).

BCT requires a shift in technology infrastructure. Enterprises must restructure their operational systems and processes to accommodate BCT systems and allocate significant resources for the transformation (LinkedIn, 2023; Mahjoub et al., 2022). Some large corporations have been early adopters of BCT due to their sufficient resources and up-to-date technologies. Nevertheless, SMEs are still exploring the features, benefits, and business applications of BCT (Wong et al., 2020). This technology reform poses a challenge for SMEs looking to adopt BCT.

Furthermore, enterprises cannot adopt their BCT systems alone due to the interoperability issue of BCT. The same or interoperable BCT systems must be adopted by channel parties to unlock its decentralized functions in data transparency, transfer, and verification (LinkedIn, 2023; Mahjoub et al., 2022). Partners' support is an indispensable driver for adopting BCT in business (Queiroz and Fosso Wamba, 2019). Large corporations play a dominant role in the supply chain and within their business networks. It is typically not difficult to secure cooperation from their business partners to adopt the same BCT systems. However, obtaining support and collaboration from channel partners can be a challenging task for SMEs.

SMEs account for the majority of businesses and jobs in most countries and regions (Lin et al., 2022). It is believed that there is a huge potential value for businesses and the economy if SMEs adopt BCT in their operations. Stakeholders and policymakers are encouraged to embrace this new technology, collaborate in driving innovation across various sectors, and promote its widespread adoption. However, the drivers of BCT adoption among SMEs have not yet been uncovered (Wong et al., 2020). The first research gap was the lack of studies on understanding the factors that encourage SMEs to adopt BCT in their businesses. This research aimed to study the importance of these factors in driving BCT adoption among SMEs. Considering the challenges facing the adoption of BCT, several factors have been highlighted in the literature, including perceived usefulness, ease of use, security, trust, governmental support (Albayati et al., 2020; Bhardwaj et al., 2021; Chaouali et al., 2016; Jackson et al., 2022; Kamble et al., 2019; LinkedIn 2023; Salisu, 2023; Shahrasbi & Parè, 2014). Other than the above factors, a key motivating factor for SMEs to adopt BCT is the presence of favorable conditions that address the challenges they encounter during adoption (Kamble et al., 2021; Mahjoub et al., 2022; Queiroz & Fosso Wamba, 2019; Salisu, 2023). However, there is no commonly agreed-upon definition in the literature regarding the favorable transformation conditions for BCT adoption. The conditions refer to the readiness to adopt technology. The literature has called for further studies to clarify the concepts and dimensions of readiness in technology adoption (Martin et al., 2008; Rusly et al., 2012; Shahrasbi & Parè, 2014; Shahrasbi & Rohani, 2018).

Building on the issues raised regarding the adoption of BCT among SMEs, it appears that SMEs need to be prepared both internally and externally. The second research gap was the lack of conceptualization regarding the readiness and conditions for adopting disruptive technology. SMEs cannot fully realize the potential benefits of BCT by simply adopting BCT alone. To effectively adopt and utilize this technology, SMEs need to ensure both internal and external readiness. Internal readiness refers to their own ability and support to use technology, also known as organizational

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readiness, structural readiness, perceived behavioral control, facilitating conditions, or self-efficacy (Clohessy & Acton, 2019; Shahrasbi & Parè, 2014; Shahrasbi & Rohani, 2018; Venkatesh et al., 2003). External readiness pertains to the preparedness, support, and collaboration from channel partners in adopting interoperable BCT systems. It is associated with collective efficacy, commitment, and motivation (Shahrasbi & Parè, 2014). It shares similar concepts with partner readiness, subjective norms, or partner pressure and directly or indirectly affects technology adoption (Gangwar et al., 2015; Kamble et al., 2019, 2021). These two types of readiness, namely internal readiness and external readiness, are inseparable and interdependent when SMEs adopt business transformation (BCT) systems. Therefore, this study introduced the term "Transformation Conditions" to refer to the favorable conditions for adopting disruptive technologies like BCT. The research objective for this gap was to explore the importance of transformation conditions among other technology adoption drivers motivating SMEs to adopt BCT in their businesses.

1.1. Significance of Study

The results contribute to the existing literature on technology acceptance, adoption, transformation conditions, technology readiness, and SMEs' technology adoption. The study reveals and compares the importance of different drivers of BCT adoption among SMEs. It also identifies key factors that motivate SMEs to adopt BCT. These findings provide researchers and scholars with valuable insights into the deployment of BCT in the SME industry. Additionally, this study contributes to the literature by conceptualizing and operationalizing favorable transformation conditions for the adoption of disruptive technologies like BCT. This area of research has been lacking in the literature, and this study addresses that research gap by identifying the favorable transformation conditions for adopting disruptive technology like BCT.

The penetration of BCT is expected to increase. Firstly, this technology is still developing and evolving, taking into consideration sustainability and greening issues. Efforts are being made to improve its interoperability, scalability, and energy efficiency. Secondly, cryptocurrencies are gaining more acceptance and regulatory support in various countries and industries. It is believed that their adoption will further increase and extend to other sectors, such as supply chain, manufacturing, and trading. Large corporations like Walmart have already embraced BCT (Sristy, 2021). However, the adoption and acceptance of BCT in the SME sector is lagging behind. SMEs contribute significantly to economies, communities, and job employment (World Bank, n.d.). If SMEs adopt BCT, the benefits and value of this technology to enterprises and economies will be substantial and enticing. Therefore, it is crucial to identify the factors that motivate SMEs to adopt BCT in their operations. The findings can be beneficial to policymakers and BCT developers in devising strategies to encourage SMEs to embrace BCT.

2. Materials and Methods

2.1. Blockchain Technology

BCT is a breakthrough technology involving DLT and computational techniques to link and store digital information (the 'block') in a database (the 'chain') (Li et al., 2020). BCT can process, record, and track transactions for businesses (HSBC, 2023). Intermediaries are eliminated, allowing various parties to directly retrieve information and transactions on a central and secured network (Ridolf et al., 2023). BCT can be classified into four types: public, private, consortium, and hybrid blockchains. Each of these serves a different purpose for a wide variety of industries (Campbell, 2023).

BCT offers various benefits to enterprises, including improved operational and logistics efficiency, increased data transparency, tracking and tracing capabilities, and enhanced asset verification and certification (Alimohammadlou & Alinejad, 2023; Edwards & Strathcole, 2020; HSBC, 2023; Montecchi et al., 2019; OECD, 2021). However, not many SMEs are adopting BCT in their businesses due to insufficient support from channel partners and the necessary conditions for BCT adoption (Wong et al., 2020). The upcoming sections will explore the common factors that drive

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technology adoption, as per the Technology Acceptance Model, Technology-Organizational-Environmental Model, and Unified Theory of Acceptance and Use of Technology.

2.2. Intention to Use BCT

When facing new technologies, some enterprises are very willing to employ them, while others hesitate to adopt them. Nevertheless, SMEs have not widely adopted BCT. Users accept new technologies when they find them useful for a particular purpose and intend to use them in the future (Bradley, 2009; Toh et al., 2022). Potential technology adopters typically rely on factors such as perceived usefulness, perceived ease of use, perceived security, perceived trust, governmental support, and transformation conditions to determine their intention to use the new technology (Albayati et al., 2020; Bhardwaj et al., 2021; Chaouali et al., 2016; Jackson et al., 2022; Kamble et al., 2019; Shahrasbi & Parè, 2014). The following sections will discuss each of the above factors in detail.

2.3. Perceived Usefulness

Users usually react positively to new technology if it is useful and beneficial to them in terms of performance and productivity (Sciarelli et al., 2021; Senk, 2013). Technology is perceived as useful if it can generate benefits, advantages, and values for users and increase their expectations (Kamble et al., 2019). It refers to the perceived usefulness of technology. However, SMEs often struggle to understand the features and benefits of BCT for their businesses, which hinders their intention to adopt BCT in businesses (Mahjoub et al., 2022).

Many SMEs do not fully appreciate the business value of BCT. On the one hand, BCT may not benefit some business operations and scenarios. SMEs prefer to stick with existing systems and infrastructure rather than adopt what they perceive as disruptive technology (LinkedIn, 2023). On the other hand, enterprises have fragmented and unclear perceptions of the usefulness and benefits of BCT (Deloitte, 2016). In general, they have limited knowledge of BCT and misconceptions about it (Rugeviciute & Mehrpouya, 2019). This misperception is partly due to the cryptocurrency bubble and crash (Usman et al., 2021). SMEs have not fully recognized the benefits of BCT in operational efficiency, business performance, productivity, effectiveness, traceability, and transparency (HSBC, 2023; LinkedIn, 2023). Without a complete understanding of its benefits and usefulness, enterprises may not be able to fully leverage the technology (Davis, 1989; Liesa-Orús et al., 2023). Following the literature, it is believed that perceived usefulness can foster the intention to use BCT (Bhardwaj et al., 2021; Gangwar et al., 2015; Senk, 2013). The following hypothesis was proposed to address this relationship:

H1: Perceived usefulness positively influences the intention to use BCT

2.4. Perceived Ease of Use

The perceived usefulness of a technology is influenced by the perception of how easy it is to use. Perceived ease of use refers to the degree to which users feel that technology is effortless to use and understand (Davis, 1989). It is a belief in one's self-efficacy to manipulate and execute the technology effectively (Bandura, 1982). This factor is particularly important to non-technical users who may have difficulty using new technology and who may be intimidated by its complexity.

Adopting BCT is not as easy as adopting technologies like artificial intelligence, social media, traditional point-of-sale systems, and similar ones among laymen. BCT is a complicated concept involving distributed ledgers, consensus algorithms, cryptography, and smart contracts (LinkedIn, 2023; Mahjoub et al., 2022). It requires a higher level of technical skills and expertise to understand and implement. However, most people do not have ideas about what blockchain is and believe that it is tied to cryptocurrencies only (Brown, 2021; Mahjoub et al., 2022). SMEs lack familiarity with and awareness of BCT (Deloitte, 2020). They do not even have access to BCT developers and platforms. As a result, they do not find its usefulness and benefits to business and struggle to understand how to apply BCT in their business (LinkedIn, 2023). Technology that is easy to use can enhance its

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usefulness from the perspective of users (Davis et al., 1989; Kamble et al., 2019; Liesa-Orús et al., 2023; Venkatesh & Morris, 2000). Regarding this relationship, the following hypothesis was proposed:

H2: Perceived ease of use has a positive influence on the perceived usefulness of BCT

2.5. Perceived Trust

Trust is about when one party relies on another to fulfill an important action, even if the trust cannot be monitored (Mayer et Al., 1995). It is an essential factor for technology adopters when they consider using new technologies (Balaskas et al., 2022; Gefen et Al., 2008; Kesharwani & Bisht, 2012).

Data transparency and traceability are the primary advantages of blockchain technology. Data stored in the network can be freely shared or shared with permissions (Campbell, 2023). However, this technology requires a high level of cooperation and reliance among parties. Unfortunately, SMEs lack trust in this innovative and complex technology for managing, storing, and sharing their data, as they do not find it reliable. When trust declines, enterprises become more resistant to adopting new technology (Albayati et al., 2020). Although BCT itself is a trust-enabling technology, it is a highly complicated technology that is hard to understand, use, and manage (Albayati et al., 2020; Ertemel, 2018). When users do not have much experience in using the new technology platform, they rely on their trust in the service provider to form trust in the platform (Chaouali et al., 2016). It is a focal concept in uncertain and risky situations (Zhou, 2011). Considering the novelty of BCT, it is believed that trust in BCT developers will be the key factor in influencing the intention to adopt it (Gefen et al., 2008; Riffai etal., 2012). When users' trust in technology declines, they become more resistant to taking risks using the technology (Albayati et al., 2020). In the literature, trust is a significant predictor of perceived ease of use (Albayati et al., 2020; McCloskey, 2006) and intention to use (Carlos Roca et al., 2009; Pavlou, 2003). These relationships become even more significant when users perceive that the technology is secure and has governmental support (Albayati et al., 2020; Fleischmann & Ivens, 2019). Based on the above relationships, two hypotheses were proposed:

H3: Perceived trust has a positive influence on the intention to use BCT.

H4: Perceived trust has a positive influence on the perceived ease of use of BCT

2.6. Perceived Security

People tend to trust and use technology that is secure and can protect their data or assets from unauthorized access (Guha & Kumar, 2018; Knauer & Mann, 2020). Perceived security refers to the belief in the safety and security of technology (Yenisey et al., 2005). It is a subjective assessment of technological risk, and any security mechanisms and advancements would strengthen users' confidence in accepting the technology (Carlos Roca et al., 2009; Fleischmann & Ivens, 2019).

BCT is supposed to be secure due to its cryptographic mechanisms, but vulnerabilities still exist. Data security can still be compromised if hackers insert new hashes and recalculate algorithms (Bigelow, 2021) or if a channel party controls more than 50% of the blocks (Binance Academy, 2020). Data privacy sharing on networks is also a related legal concern for enterprises (Mahjoub et al., 2022). SMEs feel insecure about using BCT, especially after the cryptocurrency bubble, crashes, and hacks (Usman et al., 2021). Perceived security of technology can develop users' trust in it (Carlos Roca et al., 2009; Mukherjee & Nath, 2007;). Therefore, the following hypothesis was proposed:

H5: Perceived security has a positive influence on perceived trust in BCT

2.7. Governmental Support

The level of support provided by the government significantly impacts people's trust in new technology and their intention to use it (Albayati et al., 2020; Jackson et al., 2022). Support may include policies, funding, resources, infrastructure development, regulations, and governance.

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BCT operates in a decentralized, autonomous, and self-governed global structure (LinkedIn, 2023; Salisu, 2023). However, this structure poses challenges regarding regulations across countries and regions. Consensus on BCT operations is necessary to facilitate cross-border transactions and operations (LinkedIn, 2023; Mahjoub et al., 2022). To enhance users' trust and willingness to use it, governments should take initiatives to regulate transactions on BCT, protect data and users, ensure data privacy and security, safeguard property rights, and address taxation and other related issues (Adrian, 2018; Albayati et al., 2020; LinkedIn, 2023). An optimal level of regulation and support can enhance users' trust in technology and motivate them to use it (Albayati et al., 2020; Zhu & Kraemer, 2005). Therefore, the following hypothesis was proposed:

H6: Governmental support has a positive influence on the perceived trust in BCT

2.8. Transformation Conditions

In this study, transformation conditions refer to favorable situations for transitioning from existing technological systems to those that require interoperation, especially for disruptive technologies like BCT. It encompasses both the internal and external conditions necessary for preparing for technological change. BCT is not a standalone system and requires broad adoption among channel partners to allow for data transparency, asset tracing, tracking, confirmation, and verification (Mahjoub et al., 2022). Enterprises adopting BCT not only depend on their own preparedness but also on the conditions of their partners (Kamble et al., 2021; Queiroz and Fosso Wamba, 2019). Even if SMEs are ready to adopt BCT, it may become useless if their channel partners do not use it. Enterprises must be prepared for BCT transformation in terms of both internal and external aspects.

In terms of internal readiness, enterprises are expected to have optimized and compatible technological operations, processes, and infrastructure, as well as sufficient funding and resources (Leelajay Technologies, 2023; Shahrasbi & Parè, 2014; Shahrasbi & Rohani, 2018). Enterprises must review the compatibility of their existing systems and infrastructure and assess their ability and preparedness to allocate resources in preparation for the shift (Clohessy & Acton, 2019; Thong, 1999). BCT requires a paradigm shift from existing operational systems to a new and disruptive system, which creates an integration problem for enterprises. Old systems must be either replaced, rebuilt, integrated, or transformed to fit into new blockchain systems (Eliaçık, 2022). This transformation also necessitates significant investments in system development to complete the shift (Eliaçık, 2022). This condition is also referred to as organizational readiness, facilitating conditions, technology competency, compatibility, perceived behavioral control, or self-efficacy (Kamble et al., 2019; Shahrasbi & Rohani, 2018; Venkatesh et al., 2003). This type of condition has been found to be effective in enhancing users' perceived ease of use (Kamble et al., 2019), perceived trust (AL-Ashmori et al., 2023), and intention to use technology (Gangwar et al., 2015; Lustenberger et al., 2021).

Regarding external readiness, it refers to the support and preparedness of channel parties in adopting new technology. It is about collective efficacy, collective commitment, and collective motivation (Shahrasbi & Parè, 2014; Shahrasbi & Rohani, 2018). This condition is particularly important for the adoption of BCT than other technological systems (Mougayar, 2017). An interoperable BCT system must be used to facilitate transactions, data transfer, and other BCT functions among channel parties (Mahjoub et al., 2022; Queiroz and Fosso Wamba, 2019). Existing BCT systems have unique properties, such as protocols and governance mechanisms, that make collaboration among channel parties more challenging (Mahjoub et al., 2022). This condition is also regarded as partner support, partner readiness, partner pressure, social influence (partner-related), or subjective norms (Gangwar et al., 2015; Kamble et al., 2019, 2021; Lustenberger et al., 2021; Wang et al., 2015). Greater support from partners can enhance the perceived ease of use (Kamble et al., 2019), perceived trust (AL-Ashmori et al., 2023; Chaouali et al., 2016), and the intention to use technology (Gangwar et al., 2015; Kamble et al., 2021; Lustenberger et al., 2021; Wang et al., 2010).

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Transformation conditions include internal readiness and external readiness. According to the above literature, favorable transformation conditions for BCT adoption can enhance perceived trust, perceived ease of use, and the intention to adopt BCT. Three hypotheses were proposed accordingly:

H7: Transformation conditions have a positive influence on the perceived trust in BCT

H8: Transformation conditions have a positive influence on the perceived ease of use of BCT

H9: Transformation conditions have a positive influence on the intention to use BCT

2.9. Research Methodology

According to the hypotheses proposed, the following conceptual model (Figure 1) was proposed to determine the factors contributing to the intention to use BCT among SMEs.

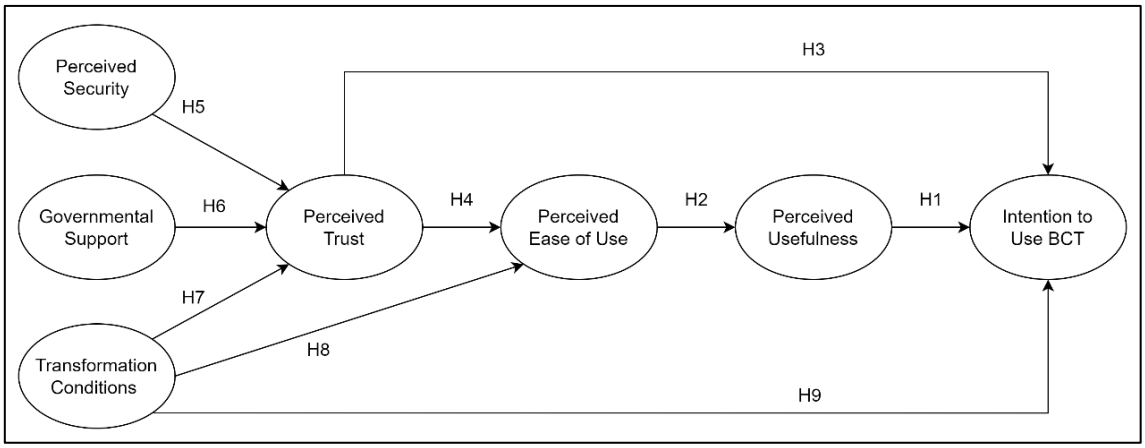

Figure 1. Conceptual Model.

This paper collected data through an online cross-sectional survey to determine the factors that drive BCT adoption among SMEs in Hong Kong. Manufacturing enterprises employing fewer than 100 persons or non-manufacturing enterprises employing fewer than 50 persons are defined as SMEs (Trade and Industry Department (HKSAR), 2021). The data was collected via Zoho Survey from a group of people working in Hong Kong SMEs. They were invited to complete the survey on behalf of their enterprises. A total of 226 valid samples (82.78% of the collected 273 cases) were screened out for analysis.

Partial Least Squares-Structural Equation Modelling (PLS-SEM) was conducted to explore the relationship among the technology adoption drivers. The sample size was sufficient to detect the effect while considering the medium effect size (σ = 0.03), 0.8 desired statistical power, and 0.05 probability level. Figure 1 illustrates the path relationships among the above constructs (Hair et al., 2022).

2.9.1. Measures

The respondents' understanding of BCT, encryption, and using BCT for business operations was first assessed using a 5-point interval scale, ranging from 1 (Don't Understand At All) to 5 (Fully Understand), before and after watching a video introducing BCT and related applications.

The conceptual model has seven constructs: intention to use BCT, perceived usefulness, perceived ease of use, perceived trust, perceived security, governmental support, and transformation conditions. Their measurement items were adapted from literature and assessed on a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), as listed in Table 1.

Table 1. Sources of Measurement Items.

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Constructs	No. of Items	Sources
Intention to Use	3	Albayati et al. (2020)
Perceived Usefulness	4	Albayati et al. (2020); Kamble et al. (2019)
Perceived Ease of Use	4	Carlos Roca et al. (2009); Kamble et al. (2019)
Perceived Trust	4	Albayati et al. (2020)
Perceived Security	3	Carlos Roca et al. (2009)
Governmental Support	3	Albayati et al. (2020)
Transformation Conditions	5	AL-Ashmori et al. (2023); Kamble et al. (2019, 2021); Gangwar et al. (2015); Nuryyev et al. (2020)

The reliability and validity of the constructs were assessed and presented in Table 2. All reflective indicator loadings were above 0.708, as suggested by Hair et al. (2019). The values of Cronbach's Alpha, rho_a, and rho_c for all constructs exceeded 0.70, indicating satisfactory to good internal consistency reliability (Hair et al., 2021).

Table 2. Internal Consistency, Composite Reliability, and Convergent Validity Results.

	Items	*Indicator Loadings*	*Mean*	*Std. Deviation*	*Cronbach's alpha*	*Composite reliability (rho_a)*	*Composite reliability (rho_c)*	*Average variance extracted (AVE)*
IU	IN1	0.826	3.566	0.848	0.882	0.882	0.882	0.714
	IN2	0.856						
	IN3	0.853						
UF	UF1	0.840	3.627	0.732	0.875	0.880	0.876	0.639
	UF2	0.763						
	UF3	0.861						
	UF4	0.727						
EU	EU1	0.811	3.387	0.828	0.905	0.907	0.905	0.705
	EU2	0.812						
	EU3	0.887						
	EU4	0.847						
TR	TR1	0.881	3.460	0.803	0.880	0.882	0.880	0.647
	TR2	0.770						
	TR3	0.814						
SC	SC1	0.843	3.665	0.762	0.876	0.876	0.876	0.702
	SC2	0.824						
	SC3	0.846						
GS	GS1	0.839	3.487	0.850	0.840	0.844	0.840	0.637
	GS2	0.815						
	GS3	0.738						
TC	TC1	0.736	3.201	0.902	0.909	0.910	0.908	0.664
	TC2	0.787						
	TC3	0.837						
	TC4	0.851						
	TC5	0.858						

Intention to Use (IU); Perceived Usefulness (UF); Perceived Ease of Use (EU); Perceived Trust (TR); Perceived Security (SC); Governmental Support (GS); Transformation Conditions (TC).

Table 3 shows that the Average Variance Extracted (AVE) values exceeded 0.50, indicating satisfactory convergent validity (Hair et al., 2019). In terms of discriminant validity, the Heterotrait-Monotrait Ratio (HTMT) was reported as it was deemed a more appropriate measure than the

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Fornell-Larcker criterion (Hair et al., 2019). The results showed that HTMT for the correlations was below 0.85 for all constructs, demonstrating adequate discriminant validity (Hair et al., 2019).

Table 3. Discriminant Validity (HTMT).

	IU	UF	EU	TR	SC	GS
UF	0.741					
EU	0.700	0.762				
TR	0.828	0.673	0.779			
SC	0.753	0.832	0.794	0.762		
GS	0.776	0.682	0.621	0.839	0.690	
TC	0.800	0.602	0.816	0.791	0.587	0.664

Intention to Use (IU); Perceived Usefulness (UF); Perceived Ease of Use (EU); Perceived Trust (TR); Perceived Security (SC); Governmental Support (GS); Transformation Conditions (TC).

3. Results

3.1. Profile of Survey Respondents

All 226 respondents were involved in decision-making for their enterprises. As shown in Table 4, the majority (42.5%) provided suggestions to decision-makers or business owners. Most of these respondents held middle management positions (53.5%). The top three job categories for these respondents were marketing and sales (18.6%), technology (16.8%), and operations (16.4%). Table 5 shows that the majority of them were employed in manufacturing (15.9%), import/export/trading (12.8%), and technology (10.2%).

Table 4. Profile of Respondents Working in Hong Kong SMEs.

Involvement in Business Decision Making	**Frequency (n = 226)**	**Percent**
Business owner and decision-maker	49	21.68%
Decision maker	77	34.07%
Provide suggestions to the decision-makers or business owners	96	42.48%
Not involved in decision-making	0	0.00%
Missing Data	4	1.77%
Job Position	***Frequency (n = 226)***	***Percent***
Business Founder	28	12.39%
Top Management	51	22.57%
Middle Management	121	53.54%
Junior Staff	19	8.41%
Missing Data	7	3.10%
Job Domain	***Frequency (n = 226)***	***Percent***
Accounting and Finance	33	14.60%
Administration and Production	1	0.44%
Chief Executive Officer	1	0.44%
Consultant	1	0.44%
Creative or Design	2	0.88%
Developers	17	7.52%
Facilities	8	3.54%
Human Resources	34	15.04%
Legal	3	1.33%

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Marketing and Sales	42	18.58%
Merchandising	1	0.44%
Operations	37	16.37%
Project Coordinator	1	0.44%
Project Management	1	0.44%
Supply Chain	1	0.44%
Teaching	1	0.44%
Technology	38	16.81%
Missing Data	4	1.770%

Table 5. SME's Business Nature of Respondent Employment.

Industry Type	*Frequency (n = 226)*	*Percent*
Auditing	1	0.44%
Backstage Outsourcing Services	1	0.44%
Bakery	1	0.44%
Catering	11	4.87%
Construction	3	1.33%
Consultant	3	1.33%
Creative industry	10	4.42%
Culture	6	2.65%
Education	20	8.85%
Event Organizer	1	0.44%
Finance	10	4.42%
Healthcare	1	0.44%
Hotel	1	0.44%
Human Resources	1	0.44%
Import / export / Trading	29	12.83%
Laundry Services	1	0.44%
Legal Services	2	0.88%
Logistic	21	9.29%
Manufacturing	36	15.93%
Marketing	6	2.65%
Media	2	0.88%
Non-governmental Organization	1	0.44%
Real estate	7	3.10%
Retail	14	6.19%
Technology	23	10.18%
Tourism	1	0.44%
Wholesale	7	3.10%
Missing Data	6	2.65%

3.2. General Understanding of Blockchain and Encryption Technology

Before taking the survey, respondents were asked about their understanding of BCT, encryption technology (ET), and the application of BCT in business operations. According to their responses, they had the best knowledge of encryption technology (M = 3.04, SD = 1.08), followed by BCT (M = 2.95, SD = 1.14), and finally the applications of BCT for business operations (M = 2.87, SD = 1.13). Respondents watched a video introducing BCT, its features, and use cases before taking the survey. After watching the video, their understanding of these three areas showed significant improvement with noticeable differences, as presented in Table 5. The video provided the respondents with a basic understanding of BCT, enabling them to complete the survey.

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Table 5. Paired Sample T-test Results of Basic BCT and ET Knowledge.

	Before (Mean, SD)	*After (Mean, SD)*	*Mean Differences*	*p-value*
Blockchain Technology (BT)	2.95 (1.14)	3.51 (0.82)	+0,56	<0.001
Encryption Technology (ET)	3.04 (1.08)	3.39 (0.84)	+0.38	<0.001
BT for Business Operations	2.87 (1.13)	3.55 (0.87)	+0.68	<0.001

3.3. Structural Paths Results

The constructs were free from the collinearity issue, and the VIF values were all less than 3 (Hair et al., 2019). The explanatory power of these constructs in determining the intention to use BCT was substantial, resulting in an R^2 of 0.779. The proposed conceptual model presented in Figure 2 was statistically supported. The PLS-SEM results in Figure 2 showed that all hypotheses were supported.

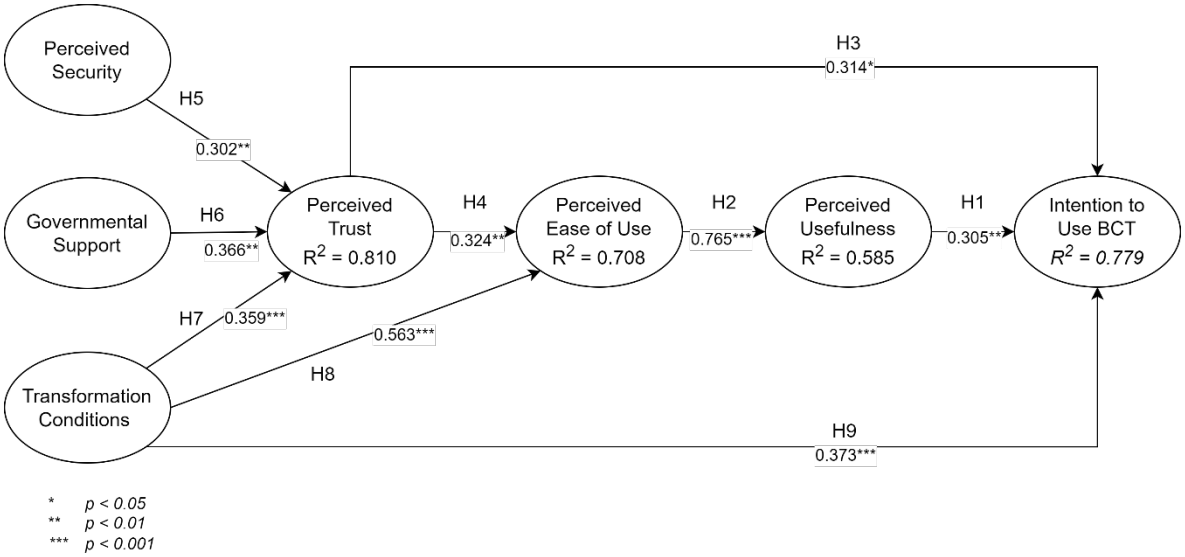

Figure 2. Results of Conceptual Model.

The intention to use BCT was positively and directly influenced by perceived usefulness (H1 supported), perceived trust in blockchain and its service supplier (H3 supported), and transformation conditions (H9 supported). Among these factors, transformation conditions played the most critical role in determining SMEs' intention to use BCT (β = .373), followed by perceived trust (β= 0.314), and lastly, perceived usefulness (β= 0.305).

When BCT was perceived as easy to use, respondents tended to perceive greater usefulness of BCT (H2 supported). Perceived ease of use was positively influenced by perceived trust (H4 supported) and transformation conditions (H8 supported). In comparison, the importance of transformation conditions (β= 0.563) was greater than that of perceived trust (β= 0.324).

Results also revealed that perceived trust in BCT and its service provider was positively influenced by the perception of BCT security (H5 supported), sufficiency of governmental support (H6 supported), and readiness for transformation conditions (H7 supported). When decision-makers in SMEs intended to adopt business technology (BCT), governmental support played a more persuasive role (β= 0.366) than transformation conditions (β= 0.359) and perceived security (β= 0.302).

According to Table 6, the total effects of BCT transformation conditions carried the greatest effect on the perceived ease of use (0.680) and intention to use BCT among SMEs (0.644). Transformation conditions also ranked as the second most influential factor in determining the perception of usefulness (0.520) and trust (0.359). The study results indicated that the BCT transformation

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conditions played a significant role in promoting the adoption of BCT among SMEs. Perceived ease of use was found to be the most critical factor influencing the perceived usefulness of BCT (0.765).

Table 6. The Direct, Indirect, and Total Effects.

	direct	*indirect*	*Total effect*
UF -> IU	0.305***		0.305***
EU -> IU		0.233**	0.233**
TR -> IU	0.314**	0.076ns	0.390***
GS -> IU		0.143**	0.143**
SC -> IU		0.118**	0.118**
TC -> IU	0.373***	0.271***	0.644***
EU -> UF	0.765***		0.765***
TR -> UF		0.248**	0.248**
GS -> UF		0.091**	0.091**
SC -> UF		0.075ns	0.075ns
TC - > UF		0.52***	0.520***
TR -> EU	0.324**		0.324**
GS -> EU		0.118**	0.118**
SC -> EU		0.098ns	0.098ns
TC -> EU	0.563***	0.116**	0.680***
GS -> TR	0.366**		0.366**
SC -> TR	0.302**		0.302**
TC -> TR	0.359***		0.359***

Intention to Use (IU); Perceived Usefulness (UF); Perceived Ease of Use (EU); Perceived Trust (TR); Perceived Security (SC); Governmental Support (GS); Transformation Conditions (TC).

4. Discussion

Research studies on the adoption of BCT among SMEs are scarce in the literature (Mahjoub et al., 2022). This study aimed to fill this research gap by investigating the importance of various factors that drive SMEs to adopt BCT in their business. The second objective of this research was to explore the significance of a technology driver, "transformation conditions," for disruptive technology like BCT in the SME industry.

4.1. Drivers to BCT Adoption among SMEs

The conceptual model examined the paths between three antecedents (governmental support, perceived security, and transformation conditions), three mediators (perceived trust, perceived ease of use, and perceived usefulness), and the intention to use BCT. All relationship paths among the constructs proposed in this research study were significantly confirmed.

4.1.1. Transformation Conditions

The study results indicated that the business transformation (BCT) conditions played a significant role, both directly and indirectly, in promoting the adoption of BCT among small and medium enterprises (SMEs) (Gangwar et al., 2015; Lustenberger et al., 2021; Queiroz and Fosso Wamba, 2019; Wang et al., 2010). Favorable transformation conditions had the most significant total, direct, and indirect effect on motivating SMEs to adopt BCT in their businesses. This factor not only significantly and directly affected SMEs' intention to adopt BCT but also indirectly affected it through trust in BCT developers, perceived ease of use, and perceived usefulness. The causal relationship paths from transformation conditions to trust and ease of use have also been confirmed (AL-Ashmori et al., 2023; Gangwar et al., 2015; Kamble et al., 2021).

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The presence of favorable transformation conditions, both internally and externally, is the most important factor in driving BCT adoption. Internally, SMEs are deemed prepared when they possess adequate funding, technological expertise, and system infrastructure to evaluate, enhance, and modernize their systems and operations. This preparation ensures compatibility and optimization for BCT adoption (Eliaçık, 2022). Externally, SMEs are prepared if they and their channel partners adopt the same or interoperable BCT systems. This preparation demonstrates support, cooperation, and collaboration from channel partners, leading to significant synergy effects through the use of BCT. Ultimately, all channel parties and related stakeholders could benefit from using BCT (Frezal & Garsous, 2020). When both conditions are present, SMEs are more likely to adopt BCT. They also have more confidence in the BCT developers and perceive BCT as easy to use.

4.1.2. Governmental Support

Governmental support emerged as the next critical factor for BCT adoption in this study. A positive and significant relationship between governmental support and SMEs' trust in BCT was confirmed. The majority of SMEs agreed that the government should provide support and oversee the implementation of BCT to instill their trust in BCT developers and encourage their adoption of BCT. Governmental support for BCT adoption was an incentive, while regulations governing BCT served as a means to reduce risks. The study results showed that governmental support indirectly influenced BCT adoption by strengthening SMEs' perceptions of trust in BCT developers, ease of use, and usefulness of BCT (Albayati et al., 2020; Jackson et al., 2022; Zhu & Kraemer, 2005). Governmental support was found to be the most important factor influencing SMEs' trust when compared to the perception of BCT security and BCT transformation conditions.

BCT and its adoption are filled with uncertainties and unknowns for SMEs. BCT's self-governed, decentralized, and autonomous structure has both advantages and disadvantages for them. On the one hand, these features facilitate data transactions and transfer across parties. On the other hand, they pose challenges in terms of data management, governance, security, and privacy across systems, countries, and regions (Frezal & Garsous, 2020; LinkedIn, 2023; Mahjoub et al., 2022; Salisu, 2023). Moreover, the interoperability issues between various BCT systems and platforms obstruct cross-border transactions, operations, regulations, and governance across various countries and regions (Frezal & Garsous, 2020; LinkedIn, 2023). SMEs find governmental support in terms of IT governance, data monitoring, and adoption initiatives to be attractive incentives. This kind of support helps reduce associated risks and is more important than the perceived security of IT and the conditions for IT transformation. It could strengthen SMEs' confidence in IT developers and their intention to adopt IT (Albayati et al., 2020; Zhu & Kraemer, 2005).

4.1.3. Perceived Security

The study results indicated that the perceived security of BCT had a significant impact on SMEs' perception of trust in BCT developers (Carlos Roca et al., 2009; Fleischmann & Ivens, 2019; Usman et al., 2021; Yenisey et al., 2005). Its importance was positive but lower compared to governmental support and the transformation conditions. SMEs believed that the operations, information sharing, and data transactions on BCT systems were secure, which led to their intention to use BCT. This intention was built on their confidence and trust in BCT developers, as well as their perception of its ease of use and usefulness for their operations (Carlos Roca et al., 2009; Mukherjee & Nath, 2007).

BCT is a groundbreaking technology that many enterprises may not fully comprehend, particularly its security features (Rugeviciute & Mehrpouya, 2019). As a distributed ledger technology with the use of cryptographic techniques, consensus algorithms, and mathematical models, BCT possesses characteristics such as decentralization, immutability, transparency, anonymity, authenticity, fault tolerance, and disintermediation (Mahjoub et al., 2022). These features enhance the security, confidentiality, and validity of data. BCT ensures that stored data is virtually impossible to revise, add, or delete without notifying the users (Goldman Sachs, n.d.). However, some SMEs may still have concerns about the protection, privacy, security, liability, and governance of data sharing and transfer on the chain due to a lack of understanding (Salisu, 2023). Among the

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different types of BCT systems, SMEs can opt for a private permissioned blockchain, which is a concrete and reliable solution for data privacy protection (Mahjoub et al., 2022). Once SMEs perceive BCT as secure and reliable, their intention to adopt BCT systems will be strengthened. It is due to their improved trust in BCT developers, as well as their perceptions of the ease of use and usefulness of BCT systems (Carlos Roca et al., 2009; Fleischmann & Ivens, 2019; Usman et al., 2021; Yenisey et al., 2005). A proper understanding of BCT and its security performance is believed to be essential for fostering SMEs' confidence in this new technology, as well as for realizing its features and benefits and their intention to adopt it.

4.1.4. Perceived Trust in BCT Developers

From the study results, perceived trust in BCT developers was a critical factor that mediated the relationships between the three aforementioned antecedents and SMEs' intention to adopt BCT systems for their businesses. Trust is an essential factor for adopters when considering the use of new technologies (Balaskas et al., 2022; Gefen et al., 2008; Kesharwani & Bisht, 2012). The level of trust had a significant indirect effect on the intention to adopt BCT via perceived ease of use and usefulness of BCT (Albayati et al., 2020; Carlos Roca et al., 2009; McCloskey, 2006; Pavlou, 2003). Its total effect on the intention to adopt BCT was significant but moderate, which was less important than the effect of transformation conditions. SMEs had an average level of confidence in BCT developers. It could be attributed to their limited experience in using BCT and their incomplete understanding of its uses, features, risks, and benefits (Chaouali et al., 2016; LinkedIn, 2023; Wong et al., 2020).

SMEs rely on their trust in BCT developers to determine their intention to adopt BCT (Chaouali et al., 2016; Zhou, 2011). This is likely due to the complexity and difficulty they face in understanding, using, and managing BCT systems (Albayati et al., 2020; Erternel, 2018; Salisu, 2023). SMEs have concerns about the reliability, security, and performance of BCT, as well as the reliability of their channel parties in using, sharing, managing, and protecting data on the blockchain (LinkedIn, 2023; Mahjoub et al., 2022). Additionally, assigning liability for fraudulent activities and security breaches on a blockchain network is challenging due to the elimination of middlemen in BCT (Salisu, 2023). Therefore, the reputation, experiences, and demonstrations of BCT developers are crucial in building trust in BCT for SMEs. Once SMEs have confidence in BCT, they are more likely to use it (Albayati et al., 2020; Carlos Roca et al., 2009; McCloskey, 2006; Pavlou, 2003).

4.1.5. Perceived Ease of Use

Similar to previous research (Davis et al., 1989; Kamble et al., 2019; Liesa-Orús et al., 2023; Venkatesh & Morris, 2000), the perceived ease of use was found to be a critical factor influencing the perception of the usefulness of BCT among SMEs in this study. When a technology is effortless to use and understand, it can enhance users' perceived self-efficacy to effectively utilize it (Bandura, 1982; Davis, 1989), leading to a greater intention to use the technology. Therefore, this factor is important for non-technical users, laymen, or those with limited knowledge of BCT. The study results indicated that the ease of using BCT was at a moderate level. Participants believed that BCT was somewhat clear and understandable to them, and it was comparable to conventional systems and platforms. They also found that using BCT for their operations would be easy.

BCT involves the use of distributed ledgers, consensus algorithms, cryptography, and smart contracts (LinkedIn, 2023; Mahjoub et al., 2022). These features can be challenging for SMEs to comprehend. For many SMEs, BCT remains a complex technology due to a lack of proper understanding. It is often mistakenly associated exclusively with cryptocurrencies or Non-Fungible Tokens (NFTs). However, BCT has functions and uses that extend beyond these commonly known applications (Pu & Lam, 2020). Furthermore, some SMEs are unaware of this new technology, as their attention is often focused on booming and relatively easy-to-use technologies like artificial intelligence and virtual reality. Additionally, integrating BCT into their daily business processes can be challenging for SMEs due to a lack of necessary technical skills and expertise. It is argued that user-friendly interfaces can make BCT products more accessible and simpler for a wider range of users, regardless of their technical expertise or background in BCT (Salisu, 2023). When SMEs find

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BCT easy to use, they will be more likely to try, understand, and utilize it (Kamble et al., 2019; Liesa-Orús et al., 2023).

4.1.6. Perceived Usefulness

From the study results, SMEs found that BCT was useful for their business operations, transactions, performance, productivity, and efficiency to a certain extent (Sciarelli et al., 2021; Senk, 2013). Its total effect on their intention to use BCT was significant but less important than transformation conditions and their trust in BCT developers. Perceived usefulness remained a critical factor in fostering the intention to use BCT among SMEs (Bhardwaj et al., 2021; Gangwar et al., 2015; Senk, 2013).

The understanding of how BCT benefits business operations and transactions is somewhat limited among SMEs. It is important to note that not all business operations require BCT, and some operations may be better suited for existing or alternative technologies (LinkedIn, 2023). SMEs have the option to continue using their current technologies or adopt technologies they are more familiar with (LinkedIn, 2023). Unless the usefulness of BCT is significantly greater than their investment in technology reform and partner cooperation, it is not easy to motivate SMEs to use BCT. The business value of BCT to SMEs remains a mystery (LinkedIn, 2023). Despite the wide range of industries and business operations where BCT can be applied, SMEs may underestimate its potential and value due to a lack of knowledge and experience regarding its possibilities and applications (Salisu, 2023). If the usefulness and benefits of BCT are not effectively communicated to users, they may choose not to invest in or leverage the technology for their businesses (Liesa-Orús et al., 2023). It is important to demonstrate and communicate the use cases of BCT in various industries and highlight its business value to encourage widespread adoption. The increased adoption of BCT by SMEs can help expand its reach into different business areas and operations. Furthermore, the experiences and benefits gained by these SMEs can be easily shared with potential users, facilitating further penetration.

4.1.7. Conceptualization of Transformation Conditions for BCT Adoption

The second research objective aimed to explore the conceptualization and operationalization of a construct related to the conditions necessary for the adoption of BCT. This construct was about the "readiness" to adopt disruptive technology and specifically focused on internal and external readiness. It is believed that these two types of readiness are inseparable when SMEs consider adopting BCT in their businesses. A unidimensional scale was used to measure this construct, taking into account the interdependence between these two aspects. The study confirmed the reliability and validity of this construct and found it to be significantly and strongly related to BCT adoption.

SMEs have to be internally prepared for the adoption of BCT, a disruptive technology (Eliaçık, 2022). They should be prepared to assess the compatibility of their existing technological systems and evaluate their readiness to transition to BCT systems (Clohessy & Acton, 2019; Thong, 1999). Additionally, they must secure sufficient funding to acquire suitable BCT systems (Leelajay Technologies, 2023; Shahrasbi & Parè, 2014; Shahrasbi & Rohani, 2018). It is also important to ensure the availability of technical staff with BCT knowledge or provide them with training on BCT knowledge and implementation.

The second condition for adopting BCT is external readiness, which involves support from channel partners. It is not expected for BCT systems to be adopted individually (LinkedIn, 2023; Mahjoub et al., 2022). Therefore, when SMEs prepare to adopt BCT, they should seek support from their channel partners to use BCT systems that are standardized, compatible, or interoperable on the same channel network (Mahjoub et al., 2022; Queiroz and Fosso Wamba, 2019). This will facilitate seamless transactions and communications among them (Salisu, 2023). However, BCT is currently in the development and evolution phase, with investments and improvements being made to various types of systems. As a result, there is a lack of standardized and scalable BCT systems to consider (LinkedIn, 2023). If BCT systems are not adopted by multiple channel partners, their value and benefits will be underestimated, subsequently affecting the intention to adopt BCT.

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Both internal and external readiness are necessary conditions for adopting BCT among SMEs. This study confirmed their importance in motivating SMEs to adopt BCT in their operations. It is recommended that this construct be operationalized using a unidimensional scale to address the interdependence of these factors in influencing BCT adoption.

5. Conclusion

BCT holds significant potential for enhancing business operations and sustainability, but its adoption among SMEs remains limited currently (IBM, n.d.; Wahyuni & Juraida, 2022). The most decisive factor that can drive BCT adoption among SMEs is favorable transformation conditions, which cover internal and external readiness (AL-Ashmori et al., 2023; Chaouali et al., 2016; Gangwar et al., 2015; Kamble et al., 2019, 2021; Lustenberger et al., 2021; Wang et al., 2010). Once SMEs are internally ready and have the support from their channel parties to use BCT, their intention to adopt BCT systems is greater. Policies and initiatives that focus on preparing SMEs to adopt BCT will help drive the penetration of BCT in this sector.

The second influential factor is the level of trust in BCT developers. It not only directly influences the intention to adopt BCT but also indirectly affects perceived ease of use and usefulness (Albayati et al., 2020; Carlos Roca et al., 2009; McCloskey, 2006; Pavlou, 2003). Although BCT is a technology that enables trust, SMEs often lack a comprehensive understanding of its uses, features, and benefits for their business operations. As a result, they rely on BCT developers for assistance with this new technology. The reputation, reliability, and track record of previous successful cases of BCT developers will be crucial in attracting SMEs to adopt BCT systems.

The usefulness and ease of use of BCT features appear to be the next two critical factors driving SMEs to adopt BCT systems (Bhardwaj et al., 2021; Gangwar et al., 2015; Senk, 2013). Technological systems that are deemed useful are expected to generate business values, advantages, and benefits for the adopters. When SMEs find the systems easy to use, their perceived benefits from using them are enhanced (Kamble et al., 2019; Liesa-Orús et al., 2023). Hence, BCT developers can demonstrate how to use BCT systems, create an easy-to-use interface for BCT systems, communicate use cases in various industries, and explain the potential impact and return on investment of BCT systems in order to attract adoption.

The support provided by the government is crucial for the adoption of BCT systems in the SME sector as well (Albayati et al., 2020; De Filippi et al., 2020; Zhu & Kraemer, 2005). This support may include funding, training, and development for technicians in the use of BCT, governance, and regulations. These measures are expected to enhance users' trust in BCT, confidence in the developers, and their intention to adopt it (Adrian, 2018; Albayati et al., 2020; Zhu & Kraemer, 2005). The government and related parties can consolidate information and resources for BCT in one central location and make them available for SMEs to access easily. To support SMEs in adopting BCT, a range of services can be provided, including consultation services, workshops, seminars, demonstrations, and training and development.

The perceived security of BCT is another factor that contributes to the intention to adopt it among SMEs. The strong security measures in processing and transacting data can enhance users' trust in BCT developers (Carlos Roca et al., 2009; Mukherjee & Nath, 2007). To deepen SMEs' understanding of BCT and its ability to secure data on chains, it is important to demonstrate and clearly communicate its special features, such as decentralization, immutability, transparency, anonymity, authenticity, fault tolerance, and disintermediation (Mahjoub et al., 2022).

In conclusion, by addressing these factors and fostering a supportive ecosystem, SMEs can leverage the potential of BCT to enhance operational efficiency, data security, and sustainable development, thereby maintaining competitiveness in the market. It is crucial for potential users, BCT developers, and governmental parties to maximize the use of BCT in the market.

6. Theoretical Recommendations

This study examined the factors critical to the adoption of BCT among SMEs. A revised concept, transformation conditions, was proposed and emerged as the most critical factor encouraging SMEs'

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intentions to adopt BCT in their operations. The reliability and validity were achieved and contributed to the literature on technology acceptance, adoption, readiness, and disruptive technology.

Moreover, these findings offer valuable insights into the use of BCT in the SME industry. Compared to large corporations, SMEs have more distinct concerns about adopting new technology for their businesses. The involvement of channel partners plays a more crucial role in enhancing the readiness to adopt this new technology.

7. Managerial Recommendations

Government-supported policies and initiatives can be developed to promote the adoption of BCT among SMEs and their business networks. These measures can raise awareness, interest, and desire to adopt BCT.

Firstly, educational programs and awareness campaigns could be organized to inform SMEs and their channel parties about the features, applications, and benefits of BCT. This will help them understand the potential advantages of implementing BCT in their operations.

Secondly, highlighting successful case studies and testimonials of BCT adoption in various industries can showcase the effectiveness of BCT systems. This initiative can generate interest among SMEs and their business partners in considering using BCT in their own operations.

After generating interest in BCT, several initiatives can be implemented to prepare and enhance internal and external readiness among potential users. For example, offering technology resources and technical support can help stimulate the desire to adopt BCT systems. Additionally, SMEs can be provided with workshops, seminars, and consultation services to support their adoption and implementation of BCT systems. Furthermore, training and educational resources can be offered to SMEs and their employees to improve their skills and knowledge in using BCT systems. All of these resources can be centralized to make them easily accessible, thereby preparing and enhancing internal and external readiness among SMEs and their channel partners. This arrangement also offers SMEs the opportunity to network and connect with other businesses in the same industry.

The government can offer financial support, grants, and incentives to encourage SMEs and their business partners to adopt BCT. Additionally, governance and regulatory frameworks should be established to ensure a secure and compliant BCT environment. SMEs can also be provided with a list of reputable BCT developers who can offer guidance and services for implementing BCT systems in their operations. This endorsed list can enhance the trust of SMEs in BCT developers and their BCT products.

BCT developers can offer practical demonstrations of BCT systems to showcase their potential value, security, and features for SMEs. The potential return on investment and cost savings achieved by using BCT systems can be effectively communicated to SMEs. Additionally, providing user-friendly BCT interfaces with guidance and support will make the systems more attractive and increase SMEs' intention to adopt them. By interacting with BCT developers, SMEs can gain a better understanding of BCT and how it can be applied to their specific business needs.

8. Limitations and Future Research

This study examined SMEs to identify the factors influencing their adoption of BCT systems. To improve the model's generalizability, the sample size could be increased and expanded to include SMEs from other regions or countries. Additionally, the model could be used to analyze the adoption of other disruptive technologies, assessing the effect of transformation conditions.

The construct, "transformation conditions," was treated as a unidimensional scale covering internal and external readiness for adopting disruptive technologies like BCT. The reliability and validity were achieved in this study, but the study could be replicated in the same or other contexts to further enhance the quality of this measurement.

In assessing the factors influencing BCT adoption, it would be helpful to evaluate more constructs and their associated relationships. This could include considerations such as anxiety,

relevance to the core business, voluntariness, price value, perceived costs, and perceived risks. The potential impact of cultural issues and sustainability concerns could also be investigated.

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