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Evolution or involution? A systematic literature review of organisations' blockchain adoption factors

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Evolution or involution? A systematic literature review of organisations' blockchain adoption factors

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Abstract

To understand the slow adoption of blockchain technology by organisations, we conduct a systematic literature review of adoption factors using a mixed-methods approach. Using thematic analysis, 880 factors are identified and grouped into 29 themes, which offer a comprehensive overview of the literature. Using statistical analysis, the identified factors are dissected into technological (T), organisational (O), and environmental (E) dimensions (the TOE framework). Themes are further classified as barriers (B), enablers (En), and ambiguous (A) to describe a firm's readiness for blockchain adoption (the BEnA framework). We emphasise the multidimensionality of adoption factors across the TOE dimensions and the conditionality of adoption enablers across the BEnA dimensions. Analysis of research trends shows that recent blockchain adoption literature has focused on elaborating upon existing research themes (involution) rather than on developing new themes (evolution). Based on our analyses, we propose future research directions, including scrutinising the interdependence and multidimensionality of blockchain adoption factors, further examining factors with conditional or unclear effects on adoption, and broadening the contextual, temporal, and theoretical aspects of blockchain adoption research.

Keywords: Blockchain Adoption; Systematic Literature Review; Research Trend; Evolution; Involution

Highlights:

- Identified 880 factors and 29 themes of blockchain adoption by organisations.
- Developed multidimensional theoretical frameworks to analyse factors and themes.
- Adoption barriers are mostly unambiguous, while enablers are often conditional.
- Recent research on blockchain is mainly an involution rather than an evolution.

1 INTRODUCTION

Blockchain technology has garnered extensive attention from both the media and academia (Perdana et al., 2021) due to the potential business benefits it offers in replacing intermediaries (Tan & Saraniemi, 2022), promoting trust (Yadav et al., 2021), and reducing transaction costs (Pereira et al., 2019). Previous research has explored potential and actual applications of blockchain in various industries, including finance (Garg et al., 2021), supply chain management (Chang et al., 2019), healthcare (Balasubramanian et al., 2021) and energy (Hojckova et al., 2020). However, adoption of blockchain technology across industries remains limited (Dehghani et al., 2022; Litan, 2022). Only 2% of digital leaders worldwide reported large-scale adoption of blockchain technology in their companies, with 8% reporting small-scale adoption, whereas other contemporary technologies have seen wider adoption: cloud computing (92%), big data (62%), and AI (36%) (Harvey Nash, 2023).

It is proposed that gradual adoption is typical of transformative technologies, whose value requires time to fully unfold (Iansiti & Lakhani, 2017; Toufaily et al., 2021). Research also suggests that lower rates of blockchain adoption result from its benefits being overstated (Ølnes et al., 2017; Taplin, 2023). Several studies have conceptually or empirically explored the barriers and enablers of blockchain adoption (Balzarova et al., 2022; Li et al., 2023; Liyanaarachchi et al., 2024; Singh et al., 2023), providing arguments for why, despite its benefits, organisations struggle with adoption (Sternberg et al., 2021). These studies are either context- or theory-specific, focusing on particular industries or factors pertinent to the selected theoretical lenses, such as the Technology Acceptance Model (Kamble et al., 2019) or the Diffusion of Innovation Theory (Agi & Jha, 2022). As a result, findings are sometimes contradictory. For example, although top management support is often argued to positively impact blockchain adoption (Kamble et al., 2021), several empirical studies have not confirmed this relationship (e.g., Nayal et al., 2023; Wong et al., 2020a). The reason provided is that top management may not be aware of the advantages of blockchain, such as enhanced traceability and information sharing. A significant barrier to blockchain adoption in the supply chain is similarly identified as a lack of technology awareness (Mathivathanan et al., 2021). Contradicting that finding, Cozzio et al. (2023) find that food suppliers are aware of the benefits of blockchain in enhancing consumer trust but remain hesitant due to a lack of intra-organisational support for inter-departmental efforts and concerns about data sharing. Beyond those studies emphasising technological or organisational factors as the most prominent drivers of blockchain initiatives, others highlight environmental factors such as government readiness (Balasubramanian et al., 2021) and external pressures (Agi & Jha, 2022). To reconcile existing findings and provide a coherent overview, our first objective is to comprehensively review organisations' blockchain adoption factors identified in the literature, thereby answering the following question.

RQ1. *What are the influencing factors of blockchain adoption by organisations?*

As researchers focus on identifying adoption factors and examining their prominence and interdependencies, some start to ask ‘what is next?’ (e.g., Choi & Siqin, 2022). Venkatesh et al. (2007) find significant progress in technology adoption research but criticise an excessive focus on replication and minor ‘tweaking’ of existing models that impede progress in understanding technology adoption. Understanding how existing research has developed over time can reveal patterns in the evolution of themes, whether these themes have been exhaustively conceptualised, extensively utilised, or intensively elaborated in blockchain adoption research. Such understanding allows us to evaluate existing blockchain adoption research and to direct future research. Hence, our second research question is:

RQ2. *How has the research on blockchain adoption developed over time?*

To answer the two research questions, we conduct a Systematic Literature Review (SLR) based on three major research databases up to 2022. Our final sample comprises 75 papers, from which 880 blockchain adoption factors are identified. These factors are aggregated into 29 common themes using qualitative thematic analysis. Quantitative tools are then employed to examine how these themes align with each dimension of the Technology-Organisation-Environment (TOE) framework. We further develop a novel framework, termed Barrier-Enabler-Ambiguous (BEnA), to capture the extent to which the themes act as enablers, barriers, or have an ambiguous role in blockchain adoption. In addition, we propose a developmental perspective to critically evaluate the literature. Inspired by philosopher Immanuel Kant (1790) and anthropologist Clifford Geertz (1963), we utilise the concepts of ‘evolution’ and ‘involution’ to distinguish between two patterns of literature development: outward progression (i.e., unveiling new themes) and inward progression (i.e., elaborating on existing themes). Our analysis finds that recent development in the literature on blockchain adoption is better characterised as ‘involution’.

Our paper attempts to make four important contributions. First, to the best of our knowledge, this is the first comprehensive review of blockchain adoption by organisations. Previous reviews are limited to specific industries or sectors, thus restricting their generalisability (e.g., Choi & Siqin, 2022; Hastig & Sodhi, 2020; Vu et al., 2021).

Second, we provide a nuanced understanding of the identified themes by extending and combining the TOE and BEnA frameworks. Many studies (e.g., Kouhizadeh et al., 2021; Orji et al., 2020) have applied the TOE framework to categorise blockchain adoption factors into one of the technological, organisational, or environmental dimensions. Moving beyond this binary approach, we allow for fractional degrees of TOE for each factor and theme. This underscores

the multi-dimensionality of technology adoption factors (Tornatzky & Fleischer, 1990). Further, we introduce the BEnA framework to unpack the driving and hindering aspects of the themes, many of which involve factors whose impacts on blockchain adoption are found to be unclear or conditional. Integrating the TOE and BEnA frameworks provides a novel perspective that deepens our understanding of themes and their interconnectedness and how these themes influence blockchain adoption.

Third, our paper provides a ‘developmental’ review instead of a static snapshot of the literature (e.g., Hastig & Sodhi, 2020). The chronological analysis enables us to gain an in-depth insight into how the literature develops over time (Majdouline et al., 2022; Yun et al., 2019). We uncover an involutionary pattern in blockchain adoption research and demonstrate how research efforts are influenced by the popularity of themes, leaving some aspects of blockchain adoption less explored. Specifically, as our results show, no new themes emerged in recent years, and novel factors are increasingly used to elaborate on existing themes. This pattern indicates that the literature has reached a saturation point in generating new themes. Building on our analyses, we propose a research agenda to direct future studies towards a more thorough exploration of themes in this saturated knowledge area.

Fourth, most literature reviews are either quantitative (e.g., bibliometrics or citation network analysis) or qualitative (e.g., thematic analysis). A notable exception is reviews combining computational methods and content analysis (see Antons et al., 2023 for a review). Our mixed-methods paper contributes to this approach. We apply qualitative thematic analysis to synthesise themes of adoption factors and implement a novel quantitative approach to measure the proximity of themes to the TOE and BEnA dimensions. The mixed-methods toolbox in this paper is applicable to other literature reviews.

Following the introduction, Section 2 describes our methodology. Section 3 summarises the themes of blockchain adoption factors to address RQ1. Section 4 investigates how these themes develop over time to address RQ2. Future research directions are discussed in Section 5 based on the identified patterns and trends of the literature. Section 6 concludes.

2 BLOCKCHAIN IN ORGANISATIONS

Blockchain technology gained widespread attention with the launch of Bitcoin in 2008 and Ethereum in 2015. Ethereum introduced smart contracts, offering more flexible and programmable capabilities that spurred interest in blockchain beyond cryptocurrencies (Catalini, 2017). By providing a decentralised, transparent, cryptographically tamper-proof, and programmable system of ledgers for storing, verifying, and exchanging various types of data through a peer-to-peer network of partners, blockchain potentially enables organisations to operate and trade securely with lower contractual hazards (Murray et al., 2021) and transaction costs (Pereira et

al., 2019). Researchers and practitioners have thus investigated how blockchain can empower organisations in the business landscape. As shown in **Figure 1**, blockchain-related publications surged exponentially after 2016.

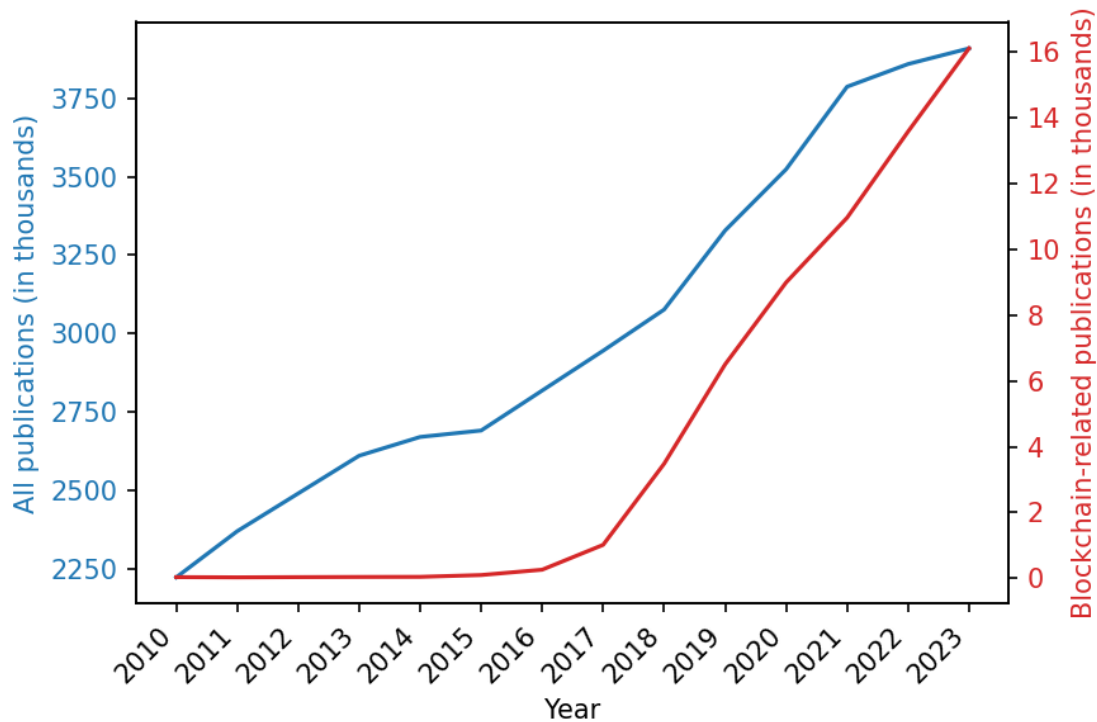


Figure 1 Blockchain-related publications.

Data Source: Scopus.

Research efforts over the past decade have led to many literature reviews. While earlier literature primarily explored technical features and design choices of blockchain, recent reviews have focused on the potential or actual effects of blockchain technology to provide business values (Constantinides et al., 2018; Rossi et al., 2019). A central theme of the recent trend is the overview of prospective applications of blockchain technology across various fields (Tandon et al., 2021). Typical examples include Konstantinidis et al. (2018), Grover et al. (2018), Alkhudary et al. (2020), and Brookbanks & Parry (2024), highlighting prevalent domains for blockchain use in public and private sectors, such as cross-border transactions, data storage, identity management, and traceability of products in supply chains. The scope of these discussions continues to expand with new or refined application domains, including patent management (Denter et al., 2023), construction contract management (Zhang et al., 2023), regulatory compliance (Tuladhar et al., 2024), digital advertising (Stallone et al., 2024), Six Sigma (Najafi et al., 2023), lean automation (Jackson et al., 2023), tokenisation of assets (Zhang et al., 2024), decentralised autonomous organisations (Bonnet & Teuteberg, 2024), and linking the metaverse with healthcare products and marketing (Hajian et al., 2024).

In addition to use cases, another key theme in these reviews is economic, environmental, and social implications of blockchain. The economic aspect emphasises operational efficiency in information management, business innovation, and collaboration flows within and between organisations (e.g., Ali et al., 2020; Ancillai et al., 2023; Agrawal et al., 2023; Peng et al., 2023). Environmentally, it involves, for instance, trade-offs between substantial energy consumption and roles in waste management (e.g., Parmentola et al., 2022; Kayikci et al., 2024). Social potential is increasingly recognised, particularly regarding gender equality (Di Vaio et al., 2023), trust (Batwa & Norrman, 2021), and anti-corruption benefits of blockchain implementation (Trequattrini et al., 2024).

Nevertheless, blockchain adoption has not significantly grown in organisations despite its potential and positive effects (Dehghani et al., 2022; Kayikci et al., 2022). Adoption decisions are endogenous and influenced by various outcome variables and key antecedents. These antecedents also affect the final outcomes of blockchain adoption. For example, organisations' capacity to manage change effectively influences both their decision-making and the desired outcomes of utilising blockchain (Tiron-Tudor et al., 2021). Consequently, a growing number of SLRs have emerged to focus on the antecedents of organisations' blockchain adoption or consider both antecedents and outcomes simultaneously (e.g., Saheb et al., 2021; Surucu-Balci et al., 2024; Zhang et al., 2024). However, these SLRs often target specific sectors, such as finance (Fosso Wamba et al., 2020), supply chain (Vu et al., 2023), and tourism (Acikgoz et al., 2024) or specific antecedents like scalability (Khan et al., 2021) and change management (Tiron-Tudor et al., 2021). A comprehensive review of antecedents of organisations' blockchain adoption is lacking. Our SLR aims to fill this gap.

3 METHODOLOGY

To ensure rigour, the review follows the recommended three-stage SLR process of Tranfield et al. (2003) and Denyer & Tranfield (2009), illustrated in **Figure 2**. In the planning stage, a review panel was established, an exploratory review was conducted, and the search strategy and selection criteria were set. The review panel (Step 1-1) comprised a panel leader (the first author) and three members (the co-authors) who were involved in various stages of the SLR. The panel aims to minimise possible retrieval, selection, and expectancy biases of the review, ensuring methodological rigour and outcome reliability (Tranfield et al., 2003; Castañer & Oliveira, 2020). Prior to the formal systematic review, we conducted an exploratory review (Step 1-2) to help establish the search strategy and selection criteria for data collection during the formal review (Step 1-3). In the conducting stage, we collected data through a comprehensive search (Step 2-1) and a meticulous screening (Step 2-2), followed by data analysis (Step 2-3). Findings were presented in the reporting stage, following a similar structure to empirical research, utilising papers as data (Denyer & Tranfield, 2009).

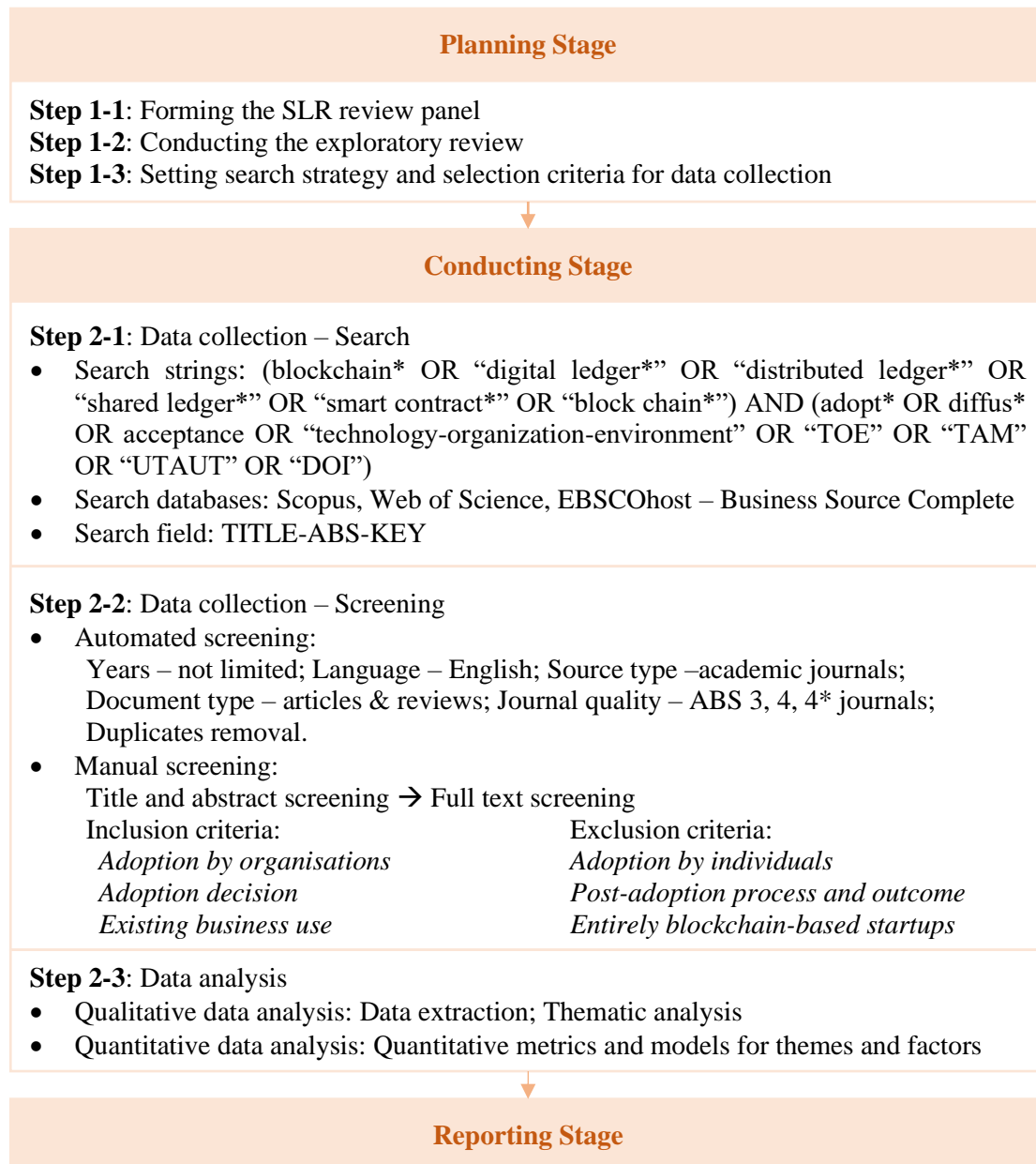


Figure 2 An overview of the SLR process.

The panel leader managed the SLR design and implementation of each step of the process. All members approved the search strategy and selection criteria. The screening process was triangulated between the leader and two members. The leader was responsible for the initial identification of factors and themes, and for mapping them across the TOE and BEnA frameworks, informed by the literature. These factors and themes, as well as their mapping into frameworks, were vetted, refined, and synthesised by panel members through regular meetings until the review panel reached a consensus, as explained in the following sections. All steps, from protocols and data collection to coding, mapping, and synthesis, were transparently documented and communicated among all reviewers.

3.1 Data collection

In Step 2-1, we used search strings that included all relevant blockchain adoption keywords, as shown in **Figure 2**, which covers a broader scope than previous reviews (e.g., Vu et al., 2021). Our search was conducted through three major literature databases, Scopus, Web of Science (WoS), and EBSCOhost's Business Source Complete (BSC), following previous systematic reviews published in leading management journals (e.g., Lu et al., 2018; Vu et al., 2021). The search field was limited to the title, abstract, and keywords (TITLE-ABS-KEY) (e.g., Lu et al., 2018; Creevey et al., 2022; Tan et al., 2022).

In Step 2-2, we filtered the papers through a combination of automated screening (years, language, source type, and document type) and manual screening (e.g., content relevance). We do not restrict the year range to minimise retrieval bias (Castañer & Oliveira, 2020; Pereira et al., 2021; Creevey et al., 2022). The language was limited to 'English', following the conventions of SLRs (Follmer & Jones, 2018). The source type was limited to 'journal' or 'academic journal', as peer-reviewed knowledge sources (Battisti et al., 2021). The document type was restricted to 'article' and 'review', excluding conference proceedings, book series, trade publications, editorials, notes, letters, and other non-refereed publications (Lu et al., 2018; Mahmud et al., 2022). To ensure the quality of research included in our review, we limited our selection to papers published in the ABS 2021 journal list and ranked 3-star or above (Academic Journal Guide, 2021), following previous review studies (Mallett et al., 2019; Battisti et al., 2021). The focus on top-tier journals is a common practice for reliably capturing high-quality scholarly debates and research trends in systematic reviews (Radaelli & Sitton-Kent, 2016; Atewologun et al., 2017). Using journal quality rather than paper rating can avoid the subjectivity of authors' judgements (Kirkman et al., 2006; Foss et al., 2010; Radaelli & Sitton-Kent, 2016). Duplicates among the three databases were then removed by matching their DOIs.

The manual screening process involved two phases of evaluation to filter papers in accordance with the general practice established in SLRs (Creevey et al., 2022). The first phase hinged on the papers' titles and abstracts, followed by the second phase based on the papers' full texts. The panel leader and two panel members conducted the assessment using a systematic review software, Covidence, to facilitate collaboration among members (Kellermeyer et al., 2018). The leader and one member independently evaluated the content relevance of each paper, and a third member served as the conflict resolver. As outlined in the assessment criteria of **Figure 2**, the focus is on blockchain adoption by *organisations*, not individual users, as in cryptocurrency trading. Moreover, we are only interested in organisations adopting blockchain for their current business rather than startups entirely built on blockchain. Finally, our focus is on the antecedents of blockchain adoption, not its outcome.

Yet, we also used ‘implementation’ and ‘application’ as synonyms of ‘adoption’, so there are three search strings: baseline (‘adoption’), expanded 1 (baseline plus ‘OR implementation’), and expanded 2 (baseline plus ‘OR application’). This ensured the comprehensiveness of our search against the potential ambiguity in the usage of ‘adoption’ in the literature. Including ‘implementation’ and applying the screening process eventually led to adding eight additional papers, while only one additional paper was included when ‘application’ was added to the search term. Finally, 75 papers were retained for data analysis. **Figure 3** summarises the number of papers that go through each selection step.

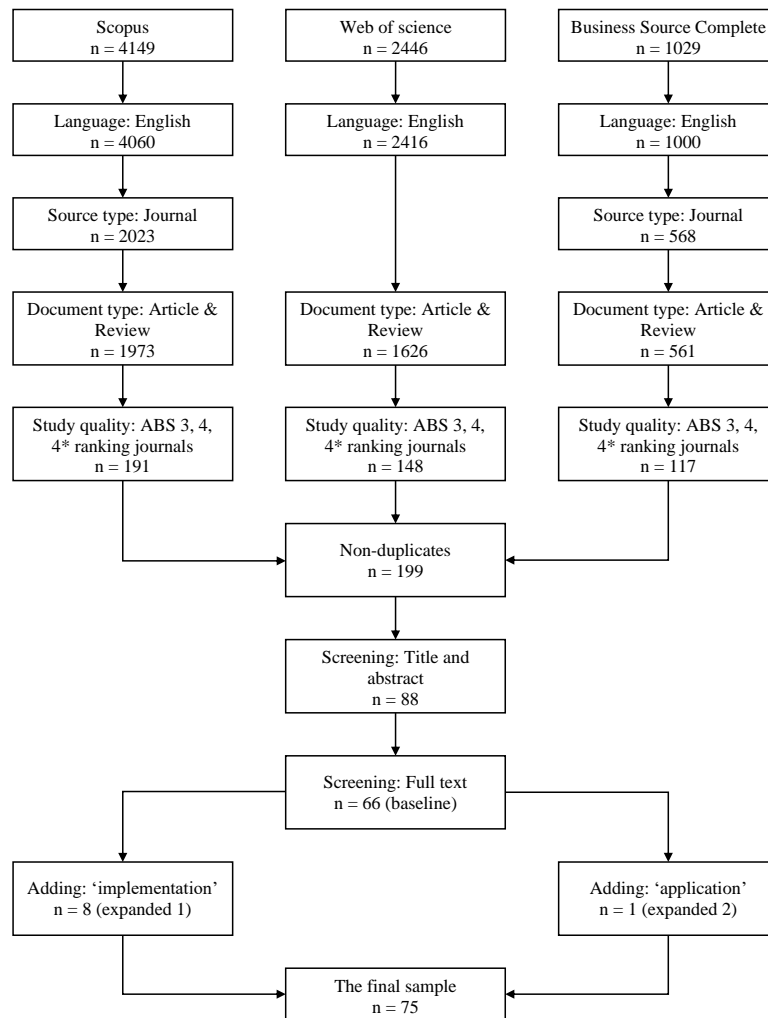


Figure 3 The number of papers included in the search and screening process.

The final sample of 75 papers includes publications from 21 journals. Most of the journals are ABS 3-star outlets (n=15, 71.43%). The OPS&TECH field (Operations and Technology Management) has the highest number of journals (n=9, 42.85%) and includes the largest number of papers (n=40, 53.33%). The journal *International Journal of Production Economics* in the OPS&TECH field has the largest number of papers (n=11, 14.67%). Other notable journals in

our sample are the *Annals of Operations Research* (n=10, 13.33%) and the *International Journal of Production Economics* (n=8, 10.67%). See **Table A.1.** in Appendix A for the full list of journals, their ABS rankings, fields, and the number of papers per journal included in our review. We also examined the top ten authors, their citation metrics, and research focus, following recent bibliographic analyses (Kumar et al., 2022; Sharma et al., 2024). We computed the authors' *sample-specific* h-index and total citations. Accordingly, we identified Joseph Sarkis (h-index=5; total citations=3193), Samuel Fosso Wamba (h-index=4; total citations=538), and Mahtab Kouhizadeh (h-index=3; total citations=2784) as the top three influential authors of blockchain adoption research. Their research mainly focuses on barriers to blockchain adoption in sustainable supply chain management. See **Table A.2.** in Appendix A for the list of the top ten authors and their research focus.

3.2 Data analysis

To fully explore the information within the data, we developed a mixed-methods approach that incorporates both qualitative data coding and quantitative data analysis (Step 2-3).

Identification of themes. We extracted content details for each paper (e.g., research questions, adoption factors, theoretical perspectives, research methodology, key findings, etc.), from which we obtained 880 factors of blockchain adoption. We then applied thematic analysis to aggregate these factors into 29 common themes to answer RQ1. To ensure reliability, we adopted the procedures proposed by Nowell et al. (2017). In our case, this method consists of three iterative phases and two guiding principles to inductively synthesise the factors into themes. In phase 1, we familiarised ourselves with the 880 adoption factors in the contexts of the papers. In phase 2, to avoid arbitrariness, we formed an initial list of themes established in the literature, such as *capability*, *compatibility*, and *complexity*. In phase 3, we aggregated all factors into an initial list of themes. Phases 2 and 3 followed two principles. The first principle is that each theme has a unique emphasis. We allowed for overlapping between theme definitions, but no theme is a subset of another. Overlapping is inevitable because these existing themes are developed and used in different papers by different authors. The second principle is that each factor can be categorised into one theme (one-to-one) or multiple themes (one-to-many). In the latter case, we considered all relevant themes to be equally relevant because there is no universally accepted way of determining the relevance weights. For example, the factor 'business process reengineering' (Choi & Siqin, 2022) highlights the necessary organisational change management for integrating existing business processes with a blockchain system; hence, the factor belongs to both *capability* and *compatibility*. The initial list of extracted factors and their aggregation into themes was undertaken by the panel leader, which was then cross-checked and refined in an iterative process with two panel members. The final list of themes was discussed, adjusted, and approved by all reviewers through several meetings until

the review panel reached a consensus. The finalised themes and their definitions are presented in the result section.

Analysis of themes. First, we classified factors into the technology, organisation, or environment dimensions, in accordance with the TOE framework (Baker, 2012; Tornatzky & Fleischer, 1990). Second, we identified if each factor acts as an enabler or a barrier to blockchain adoption. Where the literature could not clearly identify a factor as an enabler or barrier, we labelled it as ambiguous. We term this analysis as the barrier-enabler-ambiguous (BEnA) framework. Utilising factors dimensions, we quantified the extent to which each theme aligns with the technology, organisation, or environment dimensions (TOE ratios) and the extent to which each theme acts as an enabler or a barrier to blockchain adoption (BEnA ratios). The details of these ratio measurements are provided in Section A of the Supplementary Material. We combined TOE and BEnA frameworks to provide a multi-dimensional understanding of the identified themes. Mapping factors to relevant dimensions of TOE and BEnA frameworks was initially performed by the panel leader and then vetted and refined iteratively by two panel members. The final categorisation was discussed and approved by all panel members. Further, analyses of the theme and synthesis of the two frameworks were conducted through various review panel meetings.

Analysis of trends. To answer RQ2, we quantitatively analysed the development of themes and factors in the literature in two ways. First, using *papers* as the unit of analysis, we examined the dispersion of factors along the TOE and BEnA dimensions across years (see Section A of the Supplementary Material for computation formula). This shows how attention to these factors changes chronologically. Second, using *themes* as the unit of analysis, we calculated the number of unique factors per theme and traced the emergence of new themes over time. This allows us to determine whether more factors are used to elaborate existing themes (i.e., involution) or whether new themes are introduced in the literature (i.e., evolution). We further examined the correlation between the development of factors and the popularity of themes to reveal potential research directions. The results of all analyses are reported in the next sections.

4 RESULTS: THEMES

Using qualitative thematic analysis, we identified 880 factors, which are aggregated into 29 common themes (the full list of factors is provided in Section D of the Supplementary Material). The general criteria of theme aggregation are to maintain definition clarity, to ensure theme distinction, and to balance theme scopes. Large themes containing broad or mixed information in their definitions necessitate break-up into smaller, more clearly defined ones. Conversely, themes that are too narrow often represent special cases of broader themes and are merged into larger themes where appropriate. To examine the extent of overlap between themes, we quan-

tified the co-occurrence of themes using a correlation matrix and found that most co-occurrences are either weak or statistically insignificant ($p\text{-values} > 0.05$) (see Section B of the Supplementary Material), suggesting that the identified themes are adequately distinctive. The following bullet points present the definitions of these themes (in alphabetic order), along with representative examples of factors and references. This comprehensive list answers RQ1.

- **Accessibility** refers to organisations' access to the necessary environmental infrastructure for blockchain implementation. Examples include IT infrastructure (Sabeti et al., 2019), good interfaces (Bai et al., 2021), the absence of blockchain infrastructure (Govindan et al., 2022), and limited information about infrastructure (Mangla et al., 2022).
- **Adaptability** is the need for organisations to sustain themselves in a changing environment (Bai & Sarkis, 2020). Examples include stronger risk management (Sodhi et al., 2022), improved resiliency of the system (Sharma et al., 2021), and mitigated disruption risks (Narwane et al., 2023).
- **Capability** refers to organisations' objective competencies in adopting a blockchain system (Hastig & Sodhi, 2020). Examples include technical capability (Agi & Jha, 2022), financial resources (Liang et al., 2021), and human capital (Ahi et al., 2021).
- **Collectivity** refers to four core organisational activities in blockchain adoption: collaboration, coordination, cooperation, and communication, reflecting a collective approach within or between organisations (Castañer & Oliveira, 2020; Majchrzak et al., 2015). Examples include employee resistance to change (Ali et al., 2021), top management support (Kamble et al., 2021), goal alignment (Hastig & Sodhi, 2020), cooperation commitment (Kurpjuweit et al., 2021), and cooperation to adopt common supply chain objectives (Agi & Jha, 2022).
- **Compatibility** is the degree to which blockchain innovations are suitable or can integrate with existing systems and processes within organisations (Orji et al., 2020). Examples include integration with legacy systems (Rana et al., 2022), lack of organisational culture for changing (Govindan et al., 2022), lack of new organisational policies for using blockchain technology (Kouhizadeh et al., 2021), and lack of technology vision in the organisation (Sodhi et al., 2022).
- **Competitiveness** is the strategic interdependence among competitors during blockchain adoption, where competitors influence an organisation's understanding and intention to adopt blockchain (Orji et al., 2020). Examples include inter-vendor competition (Cho et al., 2021), mimetic pressures (Hew et al., 2020), competitive pressure (Kamble et al., 2021), and competition intensity between platforms (Li et al., 2021).
- **Complexity** is the perceived difficulty in understanding and using blockchain innovations (Kamble et al., 2021). Examples include perceived ease of use (Turhan & Akman, 2021), complexity in set up or use (Mathivathanan et al., 2021), and increased IT handling complexity (Sternberg et al., 2021).

- **Connectivity** refers to the real-time availability of data among involved stakeholders in a blockchain system (Samad et al., 2023; Yadav et al., 2021) and additionally, includes timely information capture (Huang et al., 2022) and supply chain disconnections (Wang et al., 2019).
- **Efficiency** refers to the ability of a blockchain system to enhance the cost-effectiveness of various processes and transactions for organisations (Sodhi et al., 2022). Examples include transaction speed (Bai et al., 2021), cost reduction (Sharma et al., 2021), and efficient decision-making (Karakas et al., 2021).
- **Feasibility** refers to the practicality and viability of adopting innovation in a specific context, particularly based on the cost-benefit analysis (Huang et al., 2022). Examples include adoption cost (Cho et al., 2021), training cost (Sodhi et al., 2022), sufficiency of internal control mechanisms (Ali et al., 2021), and assessment of blockchain's business value (Ostern et al., 2022).
- **Flexibility** refers to the ease of changing records on a blockchain system, related to blockchain's immutable nature (Rana et al., 2022). Examples include lack of contract mutability (Drummer & Neumann, 2020) and further immutability challenges of blockchain technology (Kouhizadeh et al., 2021).
- **Interoperability** refers to the ability of different systems to exchange and make use of information. It may involve different blockchains, as well as other information systems in organisations (Kurpjuweit et al., 2021). Examples include standardisation of blockchain systems (Dutta et al., 2020), establishing rules and standards for interoperability (Agi & Jha, 2022), and diverging blockchain standards and protocols (Drummer & Neumann, 2020).
- **Legality** refers to the legislation that organisations must consider in blockchain adoption (Hastig & Sodhi, 2020; Xu et al., 2022). Examples include lack of legal security (Govindan, 2022), no legal solution in case of contract breach (Drummer & Neumann, 2020), and legal issues for smart contracts (Rana et al., 2022).
- **Legitimacy** refers to an organisation's tendency to conform to rules and norms established primarily by suppliers, clients, and industry associations during blockchain adoption decision processes (Hew et al., 2020). Examples include customer requirements, trading partner pressure (Wamba et al., 2020), industry-wide initiatives (Agi & Jha, 2022), and normative pressures (Hew et al., 2020).
- **Maturity** refers to the phased features of blockchain innovations, which can be represented by its position in a technology life cycle (Govindan et al., 2022). Examples include 'infantile challenges' of blockchain (Dwivedi et al., 2023), lack of technological development (Mangla et al., 2022), and immature technology (Toufaily et al., 2021).
- **Novelty** refers to blockchain innovations' distinctive qualities compared to alternative technologies (Falcone et al., 2021). Examples include relative advantage (Hew et al.,

2020), smart contract (Samad et al., 2023), decentralisation (Yousefi & Tosarkani, 2022), and cryptographic and tamper-proof qualities (Sharma et al., 2021).

- **Policy** refers to the rules and norms set by the government, which are typically supportive of organisations' adoption of blockchain technology (Mangla et al., 2022). Examples include strong support for start-ups from government bodies (Balasubramanian et al., 2021), lack of governmental commitment (Mangla et al., 2022), and government policy and support (Orji et al., 2020).
- **Popularity** refers to the acceptance rate of suppliers, clients, and competitors towards blockchain technology (Bai et al., 2021). Examples include participation degree (Bai & Sarkis, 2020), user resistance (Kurpjuweit et al., 2021), stakeholder acceptance (Hastig & Sodhi, 2020), and network effect (Sharma et al., 2021).
- **Privacy** is the system's ability to safeguard user identity and control over personal or commercially sensitive data (Toufaily et al., 2021). Examples include immutability and encryption (Yousefi & Tosarkani, 2022), loss of private keys (Liu et al., 2021), and privacy leakage (Zhao et al., 2019).
- **Regulatory** refers to the regulations made by the government, which are typically restrictive, and that organisations must follow during blockchain adoption (Agi & Jha, 2022). Examples include lack of government regulations (Sharma et al., 2021), lack of regulatory standards and experience (Liu et al., 2021), and regulatory compliance (Rana et al., 2022).
- **Reliability** refers to the likelihood of a blockchain system to work smoothly without system faults or errors (Bai & Sarkis, 2020). Examples include occasional errors (Liu et al., 2021) and inaccurate inputs (Vu et al., 2021).
- **Scalability** refers to the effectiveness of a blockchain system for organisations as the system grows (Sodhi et al., 2022). Examples include throughput capacity (Bai & Sarkis, 2020), storage capacity and scalability (Dwivedi et al., 2023; Zhao et al., 2019), and longer latency time (Sharma et al., 2021).
- **Security** refers to the system's ability to protect data from getting into the wrong hands through a breach, leak, or cyber-attack (Kurpjuweit et al., 2021; Rana et al., 2022). Examples include malicious attacks (Liu et al., 2021), hacking (Wang et al., 2019) and security risks of public blockchains (Drummer & Neumann, 2020).
- **Subjectivity** refers to the influence of personal beliefs, perceptions, or feelings, rather than facts, on adoption decisions. Examples include hesitancy (Sabeti et al., 2019), personal innovativeness (Falcone et al., 2021), and varying opinions among decision-makers (Bai & Sarkis, 2020).
- **Sustainability** refers to the (un)sustainable prospects that blockchain technology enables for the environment and society (Yousefi & Tosarkani, 2022). Examples include

job creation (Bal et al., 2021), lower carbon footprint (Yousefi & Tosarkani, 2022), and ethical issues (Rana et al., 2022).

- **Traceability** refers to the quality of a blockchain system to discover information about where, when, and how products are produced and exchanged (Sharma et al., 2021). Examples include tracking product components (Bai & Sarkis, 2020), proving provenance (Yousefi & Tosarkani, 2022), and monitoring of agro-practices and processes (Yadav et al., 2021).
- **Transparency** refers to the quality of a blockchain system to operate in a way that makes it easy to see what actions are performed (Karakas et al., 2021). Examples include visibility (Samad et al., 2023) and enhanced food chain transparency (Vu et al., 2021).
- **Trust** refers to the spirit in which a trusted party, whether between individuals or individuals and blockchain technology, will fulfil its obligations as expected by the trusting party (Falcone et al., 2021). Examples include trustworthiness (Bai et al., 2021), trust towards blockchain (Sharma et al., 2021), inter-organisational trust (Choi & Siqin, 2022), partnership trust (Huang et al., 2022), and enhanced trust (Sternberg et al., 2021).
- **Uncertainty** encompasses various risks related to blockchain adoption from market regulators and players in the environment (Chowdhury et al., 2022). Examples include market turbulence (Orji et al., 2020), regulatory uncertainty (Dutta et al., 2020), uncertain government policies (Govindan et al., 2022), and legal and contractual uncertainty (Sharma et al., 2021).

4.1 TOE analysis of themes

Based on TOE ratios of each theme, we can position the themes in a ternary plot (**Figure 4**) against the technology (T), organisation (O), and environment (E) dimensions. For instance, the T-ratio of a theme indicates the proportion of its underlying factors that are technology-related. In the ternary plot, the theme's T, O, or E ratios measure the theme's proximity to the three vertices. The size of a circle represents the total number of factors belonging to each theme, while the colour of a circle represents the theme's dominant dimension—based on the dominant T/O/E ratio.

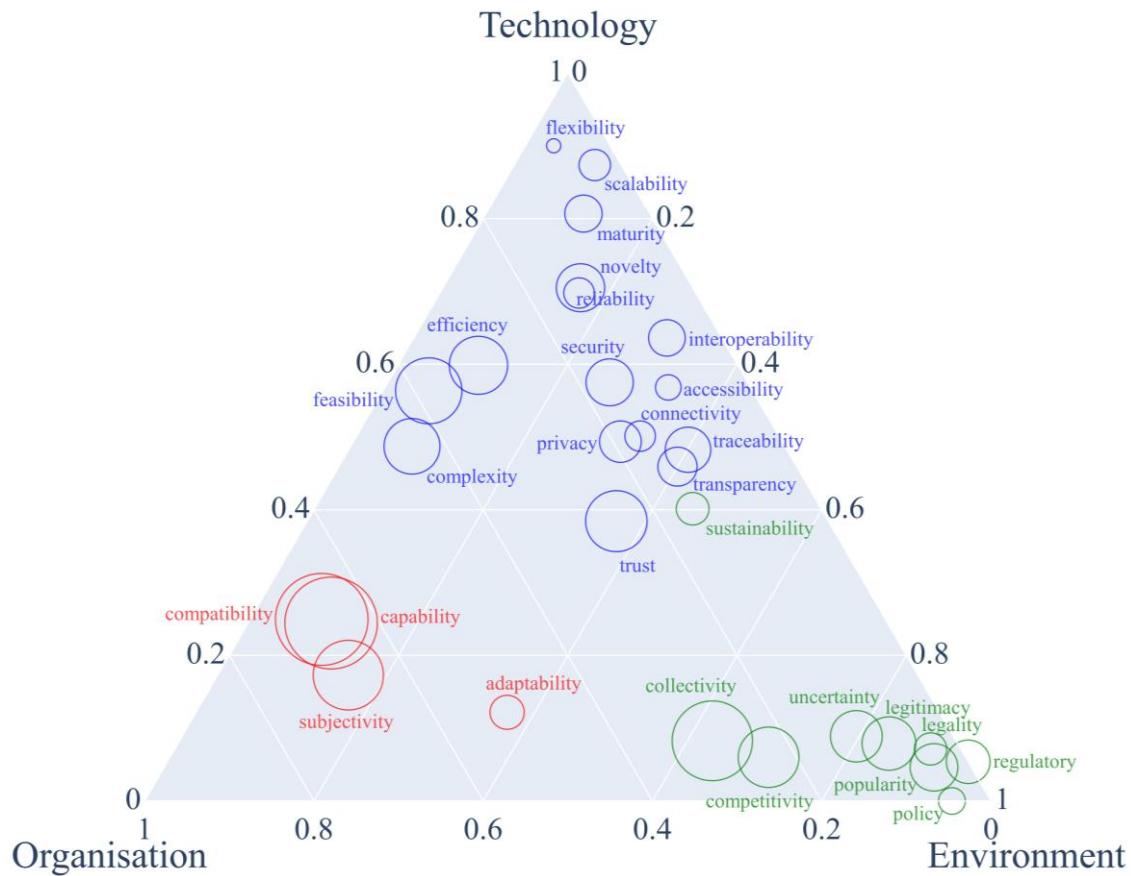


Figure 4 The TOE composition of themes.

Notes: *Blue* = Technology-oriented, *Red* = Organisation-oriented; *Green* = Environment-oriented

The ternary plot (**Figure 4**) reveals important patterns in the distribution of themes across the TOE dimensions. First, as the largest cluster, the T-family has the widest dispersion, contrasting with the more concentrated O- and E-family themes. This shows that T-family themes are intertwined with organisational and/or environmental dimensions (Kewell et al., 2017). Notably, *trust*, despite being a T-family theme (T/O/E-ratios: 0.38, 0.25, 0.37), is close to the ternary centre with a balanced set of TOE attributes. Blockchain technology, often described as a ‘trust machine’ or a ‘trustless system’ (Sodhi et al., 2022), facilitates distributed trust via unique consensus and verification algorithms, which are obviously a T-dimension attribute. Distrust by top management in blockchain’s ability to function correctly can be a barrier against adoption (Kamble et al., 2019), which exemplifies the O-dimension attribute of trust. Additionally, there is a growing emphasis on fostering trustful relationships among participating firms (an E-dimension attribute), forming the foundation for long-term investments (Sternberg et al., 2021). The interconnectedness of the trust theme makes it one of the most challenging issues in blockchain adoption (Queiroz et al., 2021). Similarly, *privacy*, a T-family theme encompassing visibility versus privacy dilemma (Sternberg et al., 2021), privacy leakage and

technical schemes (Zhao et al., 2019), and information disclosure issues (Govindan et al., 2022), is usually addressed through organisational and environmental mechanisms. For example, recent studies emphasise managing data governance (O-dimension) and establishing standards for shared responsibility within a blockchain-based platform ecosystem in inter-organisational settings (E-dimension) (Sternberg et al., 2021).

Second, O-family themes are more concentrated, reflecting the connectedness of underlying intra-organisational factors. For instance, Farnoush et al. (2022) suggest that firms with long-term financial well-being show a higher intention to adopt blockchain (*capability*), while recent studies emphasise the alignment between organisational conditions and blockchain technology (*compatibility*) such as organisational culture (Ahi et al., 2021) and organisational strategy (Govindan et al., 2022). Arguably, *capability* and *compatibility* are closely related themes as, according to the resource-based view, both reflect the resources available within an organisation (Wamba & Queiroz, 2022). One outlier of the O-family themes is *adaptability*, which leans more towards the E-family. This theme encompasses factors external to the organisation, such as improved system resiliency (Sharma et al., 2021), the level of inter-organisational policy adaptability to change (Bai et al., 2021), and various supply chain risks (Narwane et al., 2023).

Third, E-family themes are mainly distributed close to the E-vertex. Exceptions are two O-leaning themes (*competitiveness* and *collectivity*) and a T-leaning theme (*sustainability*). Both *competitiveness* and *collectivity* are themes with organisational attributes. Competitiveness acquisition is a critical consideration in adopting blockchain to explore first-mover advantage and a positive image effect (Liang et al., 2021). Firms also tend to imitate the adoption strategies of other successful firms, often their competitors, to mitigate uncertainty in a competitive environment (Hew et al., 2020). However, if competition intensifies, firms may have a reduced budget for blockchain adoption (Cho et al., 2021). Moreover, organisations also consider the risk of losing competitiveness after the adoption. For instance, shared business information within an inter-organisational blockchain system may be exploited by competitors (Dutta et al., 2020). *Collectivity* (collaboration, coordination, cooperation, and communication) is crucial for achieving alignment either within organisations (e.g., management-level commitment and employee resistance) or between organisations (e.g., partner commitment and industry stakeholder resistance) for blockchain adoption (Guan et al., 2023; Sternberg et al., 2021). To foster core inter-organisational alignments, proposed organisational capabilities include cognitive capital (i.e., shared vision among partners), relational capital (i.e., social networks), and incentive mechanisms (Choi & Siqin, 2022; Galati, 2022). As an outlier towards the T-dimension, the *sustainability* theme involves factors such as energy efficiency (Bai et al., 2021), lower carbon footprint (Yousefi & Tosarkani, 2022), and stakeholder awareness of sustainability (Saberli et al., 2019; Sternberg et al., 2021), which are linked with technological aspects of blockchain.

In summary, this analysis emphasises the multi-dimensionality of blockchain adoption factors. Most themes exhibit a mix of T-, O-, and E- dimensional attributes, especially the T-family themes. Intra- and inter-organisational interdependence plays a crucial role in O- and E-family themes. It suggests that a binary approach may not be accurate in understanding the TOE attributes of adoption factors. Our multi-dimensional analysis is an extension of the TOE framework and provides a more nuanced review.

4.2 BEnA analysis of themes

The TOE analysis describes the *contexts* in which factors affect the adoption decision (Tornatzky & Fleischer, 1990), but it does not inform the *directions* in which these factors affect the decision. To address this omission, we categorise factors into ‘barriers’ (B) or ‘enablers’ (En) to blockchain adoption (e.g., Karakas et al., 2021; Vu et al., 2021). However, the categorisation is not always clear. To be logically complete, we also add an ‘ambiguous’ (A) category. The ‘A’ category encompasses three cases: *contingent* factors, where game theoretical or mathematical models assess optimal adoption decisions contingent on variables like cost and competition (Fan et al., 2022); *indeterminate* factors, with unclear or inconclusive effects on adoption, such as psychological influences or unreported statistical significance in control variables (Falcone et al., 2021; Sternberg et al., 2021); and *insignificant* factors, which lack statistical significance, for instance, firm age and size’s impact on blockchain adoption in manufacturing (Hew et al., 2020). The BEnA framework provides an analysis of readiness for blockchain adoption by categorising themes based on the signs of their effects. **Figure 5** illustrates how themes are positioned in the BEnA dimensions. The size of each circle indicates the number of factors of each theme, and the colour denotes if the theme belongs to the T-, O-, or E-family. A couple of patterns emerge in the ternary plot.

Weak enablers and barriers (farther from the B or En vertex) tend to have more ambiguous (closer to the A vertex) impacts on blockchain adoption. In drawing two regression lines from the B vertex and the En vertex, the slopes of the two regression lines imply that, on average, weak enablers (steeper slope) tend to be more ambiguous than weak barriers (flatter slope), which can explain the challenges against blockchain adoption in practice; enablers are conditional (e.g., *competitiveness*), but barriers are more definitive (e.g., *collectivity*). The motivation to adopt blockchain for competitiveness is linked to other competitive considerations, such as competition intensity (Li et al., 2021), the degree of product disclosure (Song et al., 2023), and pricing power in the market (Zhang et al., 2022). These factors often have threshold values that further inform adoption decisions, which make *competitiveness* an enabler of blockchain adoption, conditional on other considerations. In contrast, factors within *collectivity* are primarily barriers,

and are more definitive. Examples include conflicts of interest (Kurpjuweit et al., 2021), resistance from current economic winners (Wang et al., 2019), and problems in collaboration, communication, and coordination within the supply chain (Saber et al., 2019).

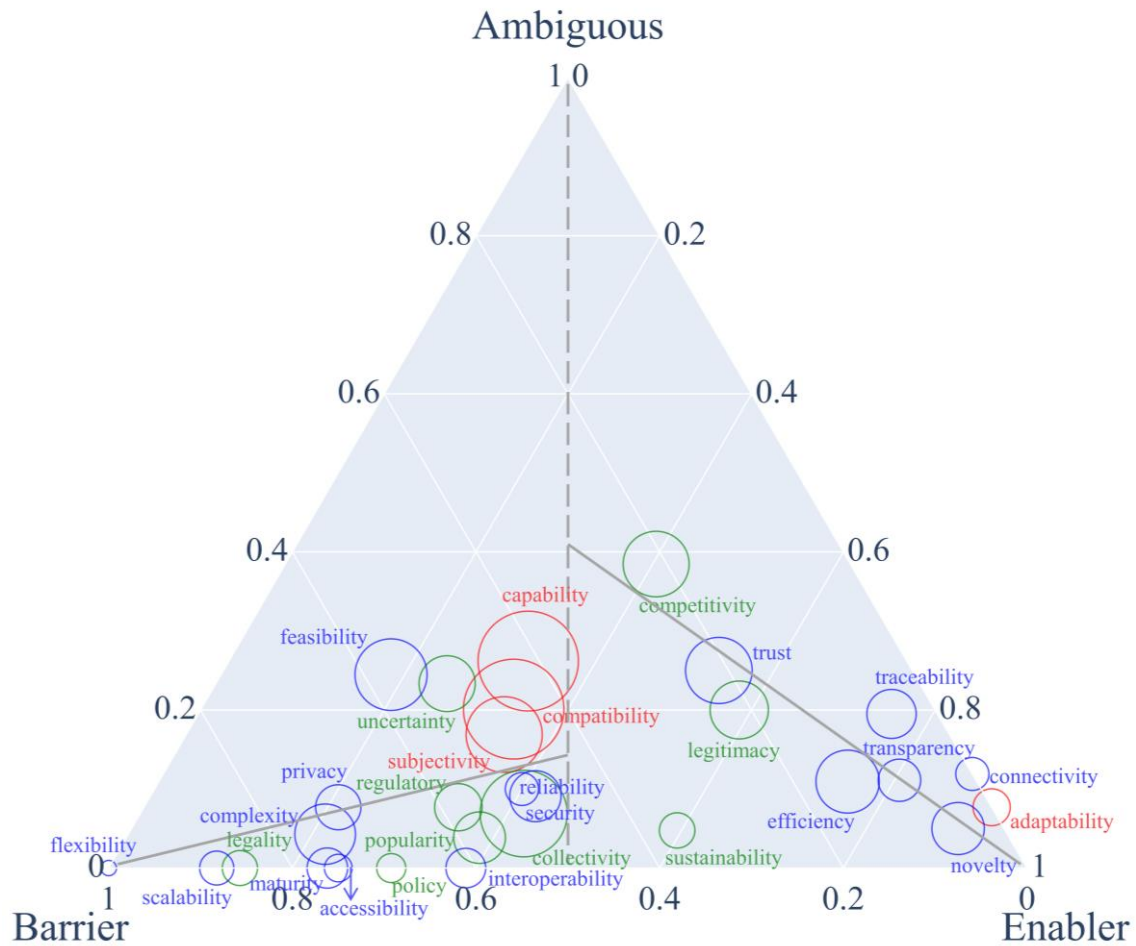


Figure 5 The BEnA composition of themes.

Notes: *Blue* = Technology-oriented, *Red* = Organisation-oriented, *Green* = Environment-oriented.

Upon combining TOE analysis, it becomes evident that across all families, more themes are on the barrier side, and fewer themes are on the enabler side. The average proportions of barriers (i.e., B-ratios) in the T-, O-, and E-family themes are 47%, 34%, and 50%, respectively. The smaller B-ratio of O-family themes suggests that the main challenges to blockchain adoption come from the environment and the technology. These barriers are potentially beyond the control of organisational decision-makers, exacerbating the challenges of blockchain adoption. Blockchain grapples with inherent tensions on a technological level, such as *traceability* vs *efficiency* (Sternberg et al., 2021), *transparency* vs *privacy* (Vu et al., 2021), immutability (related to *security*) vs *flexibility* (Govindan et al., 2022). External legal issues, like the absence of a legal framework (Xu et al., 2022) and varying laws across countries (Vu et al., 2021),

expose organisations adopting blockchain to legal compliance risks. Similarly, the absence of supportive government policies (Kouhizadeh et al., 2021) and regulatory standards (Wong et al., 2020a) further contribute to these risks.

In summary, our findings reveal that the effects of adoption barriers, which mostly pertain to technology (e.g., technical tensions) or environmental aspects (e.g., legal and regulatory compliance), are more unequivocal. In contrast, the impacts of enablers (e.g., inter-organisational dependence and organisational readiness) tend to be conditional.

5 RESULTS: TRENDS

The analyses of themes summarise the state of the art, but how has the literature developed to this state (RQ2)? Answering this question can illuminate the future research directions. A developmental perspective is required in order to discern trends in research (Ferrigno et al., 2023; Yan et al., 2019), and in taking a temporal review of the papers, we distinguish two types of development: evolution and involution.

The term ‘involution’ was first coined by the philosopher Immanuel Kant in 1790 (Kant, 1790; Wang & Hui, 2021). Anthropologist Clifford Geertz later used ‘involution’ to describe a phenomenon in which *‘agriculture could not be extended outward, and labor could only be constantly devoted to the limited production of rice’* (Geertz, 1963, pp. 80-81). In this context, agricultural development reached a point of inward over-elaboration, with population growth failing to increase productivity (White, 1983). Inspired by this tradition, we use the terms ‘evolution’ and ‘involution’ to describe outward and inward progressions in research, respectively. Evolution refers to the emergence of new themes, whereas involution describes the elaboration of existing themes through the incorporation of novel factors into a given theme. Evolution provides breakthroughs, though too rapid evolution results in a lack of detailed understanding of the phenomenon. When the literature ‘involutates’, researchers focus on a deep investigation of discipline or subject. Involution carries the risk of excessive elaboration, leading to publications that increase in complexity but fail to embrace broader, inter- or trans-disciplinary thinking necessary for novelty (de Jong et al., 2016; Gooding et al., 2023).

5.1 Trend analysis of themes

We measure the extent of evolution by the number of new themes identified per quarter by extant research and involution by the number of identified factors per theme per quarter, normalised by the number of papers. **Figure 6** suggests a significantly positive trend in the number of factors per theme, yet no new themes emerged after 2020Q1. This indicates an early period of evolution as researchers examine the novel blockchain space. An involutionary trend in later blockchain adoption research followed, suggesting that the literature quite rapidly reached a

saturation point or limit in generating new themes. Note that the number of factors per theme is calculated for each paper individually and then averaged. Each paper should not have duplicate factors, which ensures the factors' uniqueness per theme. While duplicates might occur across papers, such instances only reinforce our proposition of inward-looking literature; duplication provides even less novelty than involution.

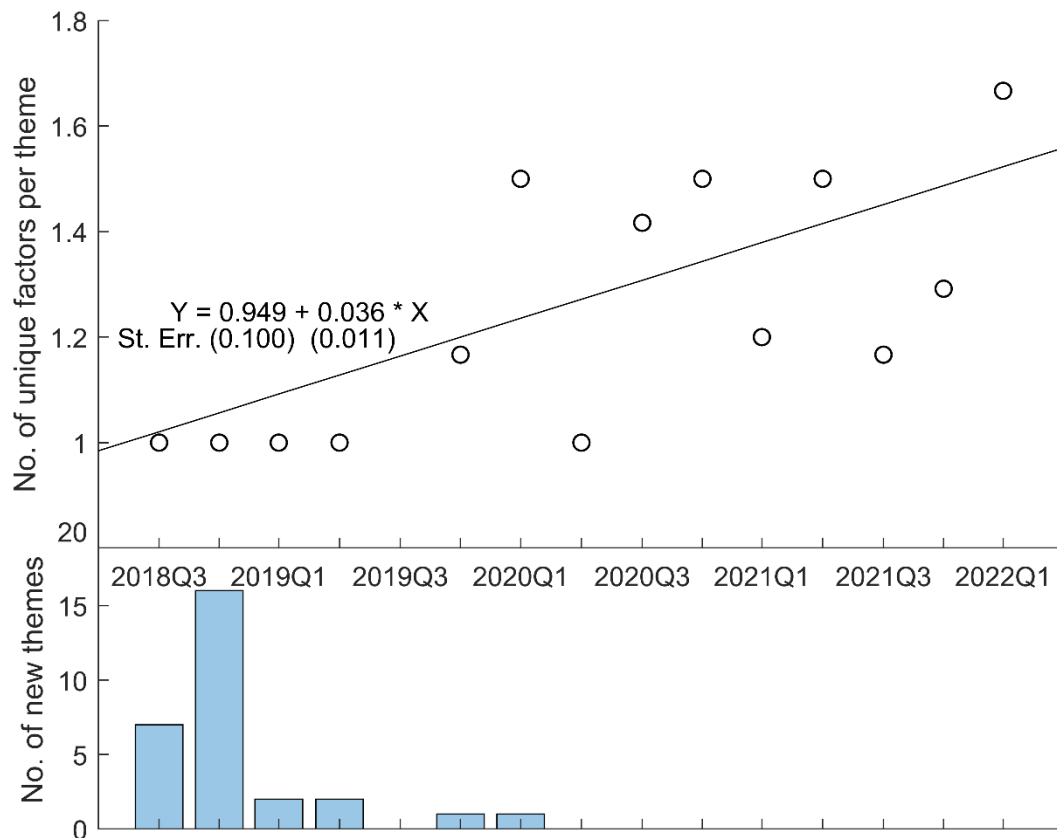


Figure 6 The trend of the number of factors per theme and the number of new themes.

To better capture the trends in the literature, we report the proportions (averaged over papers) of factors belonging to TOE and BEnA dimensions in **Table 1**.

Table 1 The average proportions of TOE/BEnA dimensions over time

Year	T	O	E	B	En	A
2018	0.34	0.36	0.30	0.56	0.29	0.14
2019	0.42	0.29	0.29	0.41	0.45	0.15
2020	0.29	0.40	0.31	0.23	0.44	0.33
2021	0.30	0.34	0.36	0.33	0.40	0.27
2022	0.32	0.27	0.41	0.40	0.47	0.14

In the TOE dimensions, researchers' attention shifts to the E-family factors in later years. Neither the T-ratio nor the O-ratio exhibits a clear trend from 2018 to 2022, while the E-ratio

expands substantially from 30% to 41%. This implies that environmental factors (e.g., coordination complexity and regulatory uncertainty) have recently received greater attention from researchers examining blockchain adoption. This trend in research emerges because blockchain is a technology built on collaboration between networked participants, without which the technical benefits disappear (Patil et al., 2023). Other important E-family themes include support and regulation (e.g., *regulatory*, *legality*, and *policy*) from the government, which have thus far lagged behind business practice.

In the BEnA dimensions, researcher attention has gradually shifted from barriers to enablers over time. As shown in **Table 1**, the En-ratio has risen significantly from 29% to 47%. This implies a shift in research focus from explaining ‘why not adopt’ (barrier factors) to addressing ‘why and how to adopt’ (enabler factors). This trend in research reflects a changing attitude in business practice, as empirical findings are mostly based on interviews and surveys of practitioners. As environmental conditions such as related policies and regulations mature, more organisations are expected to adopt blockchain solutions to explore the potential benefits (Hojkova et al., 2020; Orji et al., 2020).

5.2 ‘Directed’ research change

The previous subsection demonstrated how factors and themes of research in blockchain adoption have developed over time. Building on the identified trends, this subsection attempts to further explore the overarching relationship among the research trends.

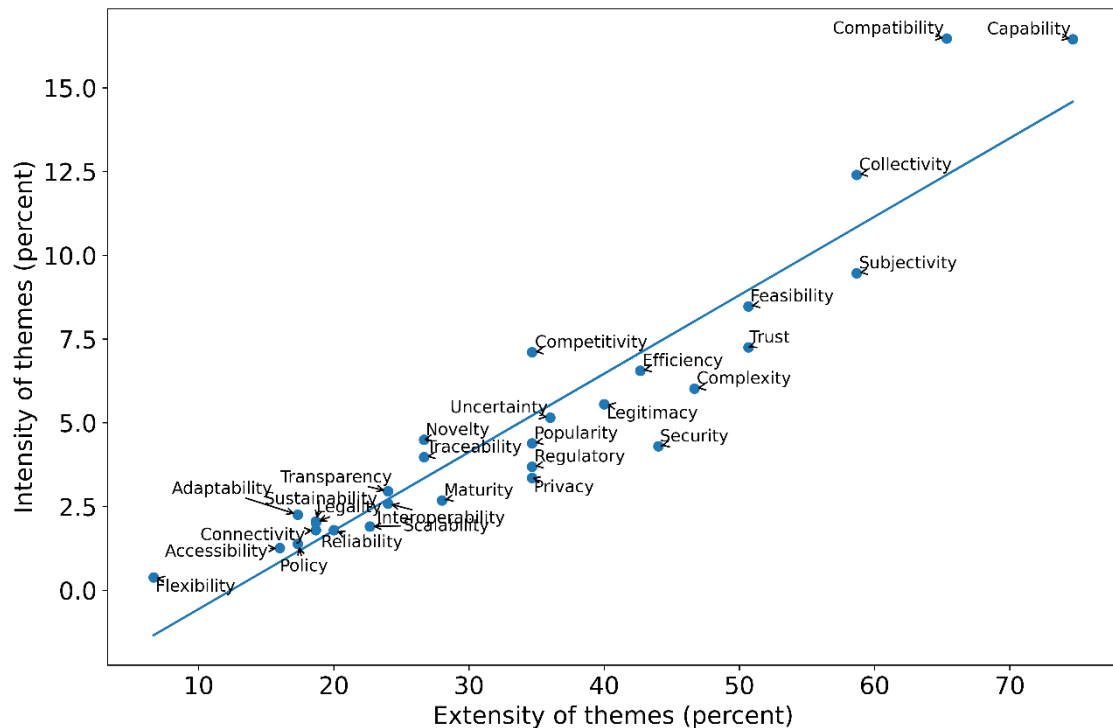


Figure 7 The relationship between intensity and extensity of themes.

To establish the relationship, we quantify two constructs: (i) the research intensity of a theme is measured by the proportion of *factors* that have elaborated the theme; (ii) the research extensity of a theme is measured by the proportion of *papers* that have investigated the theme. The scatter plot in **Figure 7** demonstrates a statistically significant and positive relationship between research extensity and intensity of themes ($p\text{-value} < 0.05$), suggesting that themes with wider research attention (extensity) are likely to have more factors (intensity). Put differently, the direction of blockchain adoption research is influenced by the popularity of the theme. For example, the most discussed themes (*compatibility* and *capability*) encompass 15 times more factors than the least discussed themes (*flexibility* and *accessibility*).

This ‘directed’ research change has an important implication for blockchain adoption research. We demonstrate that there is a significant imbalance in the level of elaboration among the identified themes, which appears to be driven by their popularity. If an extensively investigated theme tends to be more intensively explored, then popular themes will grow faster than other themes. Themes may grow to a point where they are destined to break down into smaller new themes, leading to an evolution. We witnessed this evolutionary development in the earlier years before 2020. For example, initially, the three themes *regulatory*, *legality*, and *policy* belonged to a single aggregate dimension, as they all related to *authority*. As an increasing number of researchers focused on this theme and identified contributing factors, distinct foci emerged, based on the general principle of theme identification stated in Section 4. *Regulatory factors* are restrictive rules set by the government (Sharma et al., 2021), differing from *legality factors*, which are restrictive rules set by the legislature (Xu et al., 2022). The former consists of temporary rules, while the latter comprises permanent regulations. Beyond these restrictive rules, supportive *policies* have also been implemented by policymakers to foster blockchain adoption (Orji et al., 2020).

6 FUTURE RESEARCH AGENDA

Drawing on evidence from preceding analyses, we discuss three directions to advance blockchain adoption research (**Table 2**).

Scrutinising interdependence and multi-dimensionality aspects of blockchain adoption. The first direction is to study themes that demonstrate significant interdependence across TOE dimensions, as identified in our TOE analysis. These types of themes cannot be well studied within one single dimension, so multiple views are needed to study themes that involve multiple stakeholders. Notably, themes such as *trust*, *privacy*, *sustainability*, and *collectivity* demonstrate significant multi-dimensionality and interdependence. *Trust* plays a pervasive role across all TOE dimensions. While the role of trust as a key determinant for adoption decisions has been increasingly recognised (e.g., Gan & Lau, 2024; Wong et al., 2020a), less attention has been given to the trust-building process. Moreover, although blockchain shifts the mode of

trust towards trust in technology, the perceived trustworthiness of organisational partners and technology providers remains instrumental (Lumineau et al., 2023), at least in the early stages of adoption. Additionally, while blockchain reduces reliance on a central authority, regulatory certainty and safeguards still play a role in fostering trust (Orji et al., 2020). Exploring the interplay between these aspects, the mechanisms of trust formation, and their changing significance over time is a promising research area. Similarly, reconciling tensions between *privacy* concerns, system transparency, and competitive considerations in adopting blockchain technology warrants further investigation across technological, organisational, and environmental levels. Investigating the diverse factors influencing blockchain adoption across multiple *sustainability* dimensions, including environmental, economic, and social aspects, presents another promising research area.

Furthermore, *collectivity* involves significant inter-organisational dynamics to foster blockchain adoption. While existing literature emphasises the challenges of inter-organisational alignments (e.g., Kouhizadeh et al., 2021), the process of establishing these alignments in adoption decisions remains unclear. For instance, Galati (2022) notes that relational capital is necessary but not sufficient for adopting blockchain in supply networks. This calls for a deeper understanding of how competitive considerations impact co-optative dynamics in blockchain network formation (Galati, 2022), how centralised leadership empowers joint implementation of blockchain while balancing the necessity for decentralised governance among organisations (Guo & Zhou, 2023; Naef et al., 2022), and how interoperability between different blockchain networks impacts collective adoption in multi-stakeholder situations (Dutta et al., 2020).

Examining conditional or unclear drivers of blockchain adoption. The second direction is to further examine themes that are unclear or conditional—the ‘A’ dimension of the BEnA framework—to better understand their roles. Factors that are theoretically relevant but empirically rejected (e.g., top management support, performance expectancy, firm size) or indeterminate (e.g., hesitancy, regret aversion, organisational readiness) warrant deeper examination to confirm the plausibility and the generalisability of their effects on blockchain adoption. For instance, firm size is found to have no effect on halal manufacturers’ intention to participate in blockchain-based traceability systems (Hew et al., 2020). However, subsequent research in the context of the Chinese supply chain reveals that firm size does play a significant role, with large organisations demonstrating higher readiness compared to smaller firms (Shahzad et al., 2024). For the *contingent* factors theoretically discussed in analytical models (e.g., competition intensity, organisation sector, information disclosure policy), future empirical studies can verify the theoretical propositions and understand how these factors are moderated by other variables. Further empirical investigation is necessary to understand the varying competitive considerations across market structures, including different competition intensities and distinctions between incumbent firms and potential entrants. *Competitiveness* and *capability* stand out as the

two themes with the highest ambiguity ratios in our analysis. Contingent factors like price, cost, consumer sensitivity to blockchain, and competition intensity are notable ambiguous factors of *competitiveness*. *Capability* involves broader aspects of ambiguous factors, such as insignificant factors like firm size, age, and top management support, contingent factors like sector, and indeterminate factors like organisational readiness.

Expanding contextual, temporal, and theoretical investigation of blockchain adoption. The cycle of evolution and involution is inherent to scientific inquiry. Based on our analysis, it appears that blockchain adoption research is in a period of involution, marked by a saturated set of themes. We propose two avenues to invigorate research with fresh perspectives on these themes, which could potentially spur a new evolutionary phase in blockchain adoption research. The first avenue is context expansion, spanning not only ‘space’ (cross-sectional) but also ‘time’ (longitudinal) dimensions. While many studies investigate or survey blockchain adoption factors in a cross-sectional setting, there is a consensus that future research should adopt a more longitudinal approach to capture dynamics across the technology adoption process (e.g., Hew et al., 2020; Kamble et al., 2019; Wong et al., 2020b). Currently, our sample identifies only one longitudinal case study by Sternberg et al. (2021), offering an in-depth understanding of supply chain organisations’ struggles with blockchain adoption. Broader and further longitudinal studies are essential to understand the evolution of barriers/drivers and their shifts in prominence and relationships (Kouhizadeh et al., 2021). The second avenue involves expanding theoretical perspectives. In our sample, five underpinning theories account for more than half of those used in the blockchain adoption literature, i.e., Game Theory, Technology Acceptance Model, TOE framework, Unified Theory of Acceptance and Use of Technology, and Diffusion of Innovations Theory (see Section C of Supplementary Material). These established theories are effective in explaining themes from a single disciplinary perspective. However, further investigation into the interdependence aspects of themes, such as industry leadership and trust-building, could better fit into different theoretical frameworks that recognise the transdisciplinary nature of blockchain technology adoption (Chandler & Kirsch, 2018; Mačiulienė & Skaržauskienė, 2021). Future research should further develop theories to address the inherent *causal complexity* in blockchain adoption, which involves the interdependence of multiple conditions, multiple pathways to a given outcome, and indefinite causal relations, from a configurational perspective (Misangyi et al., 2017).

Table 2 Key avenues for future research

Research directions	Key research areas
	Trust
Research direction 1:	<ul style="list-style-type: none"> Exploring the trust-building process in organisations’ blockchain adoption decisions and the interplay of technological, organisational, and institutional aspects of trust

<i>Scrutinising interdependence and multi-dimensionality aspects of blockchain adoption</i>	<ul style="list-style-type: none"> • Examining how the relative importance of technological trust, inter-organisational trust, and institutional trust evolve during the blockchain adoption process • Examining whether and how technological, inter-organisational, and institutional aspects of trust complement or substitute each other at different stages of blockchain adoption
	<p>Privacy</p> <ul style="list-style-type: none"> • Examining the tension between heterogeneous organisations' privacy concerns and maintaining information transparency in blockchain networks • Exploring how cross-border blockchain networks between organisations address privacy and data protection laws in different jurisdictions • Examining how blockchain facilitates secure and private data sharing between organisations without compromising competitive advantages
	<p>Sustainability</p> <ul style="list-style-type: none"> • Exploring the diverse factors shaping blockchain adoption across multiple sustainability goals, contextualised within specific environmental (e.g., renewable energy trading, carbon credits), economic (e.g., supply chain finance, assets tokenisation), and social (e.g., humanitarian operations management, ethical supply chains) dimensions • Examining the impact of stakeholder awareness and sustainability inclination on blockchain adoption decisions • Examining the impact of sustainability standards, corporate accountability requirements, and policy initiatives on blockchain adoption decisions
	<p>Collectivity</p> <ul style="list-style-type: none"> • Studying the competition versus cooperation tension and inter-organisational alignments in forming blockchain networks • Studying the tension between a need for centralised leadership while maintaining the decentralised operation • Studying how the interoperability between different blockchain networks affects its collective adoption in multi-stakeholder situations
<i>Research direction 2: Examining conditional or unclear drivers of blockchain adoption</i>	<p>Competitiveness</p> <ul style="list-style-type: none"> • Empirically examining the role of contingent factors suggested in analytical models such as competition intensity, consumer sensitivity to blockchain, information disclosure policy, and their moderation or mediation effects on blockchain adoption • Empirically examining how competitive considerations for blockchain adoption vary across market structures with different competition intensities • Empirically examining the variation in competitive strategies, such as entry deterrence, for blockchain adoption between incumbent firms and potential entrants

Research direction 3: <i>Expanding contextual, temporal, and theoretical investigation of blockchain adoption</i>	Capability
	<ul style="list-style-type: none"> • Empirically examining contextual nuances that influence the statistical significance of factors like firm size, age, and sector • Empirically examining how organisational cultures and leadership styles of top management influence blockchain adoption decisions across organisations
	Context expansion
	<ul style="list-style-type: none"> • Investigating how blockchain adoption differs across countries with diverse cultural and institutional settings, including collectivistic versus individualistic cultures, as well as well-established versus less developed institutional safeguards • Conducting a comparative analysis of blockchain adoption across sectors with varying concerns about privacy, legal compliance, security, etc • Employing a longitudinal approach to study organisations' blockchain adoption decisions, capturing the evolution of barriers/enablers and their shifts in prominence and impact throughout the technology adoption cycle
	Theoretical perspectives expansion
	<ul style="list-style-type: none"> • Integrating current technology adoption theories to comprehensively understand various aspects (symbolic, functional, behavioural, institutional, etc.) of blockchain adoption • Employing theories that address the tensions and multidimensional nature of blockchain adoption, such as complexity theory, sociomateriality, and paradox theory, to offer novel perspectives on organisations' blockchain adoption • Developing theories to address the <i>causal complexity</i> inherent in blockchain adoption, which involves the interdependence of multiple conditions, multiple pathways to a given outcome, and indefinite causal relations, from a configurational perspective. Qualitative Comparative Analysis (QCA) can serve as a valuable tool for building such theoretical propositions

7 CONCLUSION AND DISCUSSION

In this paper, we offer an in-depth, integrative review of blockchain adoption factors and extract the patterns and trends of the research through a developmental perspective. In the mixed-methods SLR, to answer RQ1, applying a thematic analysis, we identified 29 themes from 880 factors in organisations' blockchain adoption research. We mapped these themes across technology-organisation-environment (TOE) and barrier-enabler-ambiguous (BEnA) dimensions and quantified their proximity to each dimension. To answer RQ2, applying a quantitative approach, we analysed how these themes have been developed in the previous studies over time and uncovered recent research attention towards elaborating established themes rather than

generating new themes—an involutionary pattern. Building on these findings, we discuss theoretical contributions and practical implications.

Our paper provides a comprehensive review of the research and adoption factors without being limited to a specific industry (c.f., Chang et al., 2019; Balasubramanian et al., 2021) or a subset of factors based on a specific theory (c.f., Agi & Jha, 2022; Kamble et al., 2019). The holistic overview reconciles contradictory findings and unifies fragmented evidence in existing research. Additionally, previous reviews often use a binary approach to examine blockchain adoption (e.g., Toufaily et al., 2021; Xu et al., 2022). In this review, by integrating research findings through multidimensional analyses, we highlight the interdependence of adoption factors among the technological, organisational, and environmental aspects.

The integration of the TOE and BEnA frameworks shows that adoption barriers are more frequently related to the technology (e.g., technology tensions such as *traceability* vs *efficiency* and *transparency* vs. *privacy*: Sternberg et al., 2021) or the environment (e.g., legal and regulatory compliance: Wong et al., 2020a). In contrast, the positive impact of enablers (e.g., inter-organisational trust and organisational readiness: Choi & Siqin, 2022) tends to be conditional on other parameters such as inter-organisational competition and collaboration (Li et al., 2021) and intra-organisational support for inter-departmental efforts (Cozzio et al., 2023). Overall, situating adoption themes across TOE and BEnA dimensions highlights the multidimensionality of blockchain adoption and reveals potentially overlooked dimensions. This analytical framework can be generalised to adoption of other disruptive technologies such as artificial intelligence, cloud computing, big data, etc.

Demonstrating the trends in the literature, we show that research on blockchain adoption after 2020 follows an involutionary pathway. These studies have focused on examining the established themes in blockchain adoption, such as *capability* and *compatibility*, often inflating them with novel (sometimes repetitive) factors, while leaving other themes (e.g., *flexibility* and *accessibility*) less explored. Our conjecture is that the current trend is temporary. Popular themes will reach a saturation point, and it will be then that we expect to see new themes developed and new theories applied to accommodate the new themes. Rene Descartes views such development as ‘a tree of knowledge’, where new knowledge springs from the old when old frameworks fail to solve new problems (Ariew, 1992). We propose three directions to advance knowledge development in blockchain research: scrutinising the interdependence and multidimensionality aspects of blockchain adoption, examining its conditional or unclear drivers, and broadening contextual, temporal, and theoretical investigation of blockchain adoption. We hope our research agenda spurs future studies to address critical gaps in understanding organisations’ blockchain adoption.

The review also generates practical implications for different stakeholders in blockchain adoption. The comprehensive set of themes of blockchain adoption helps managers proactively mitigate risks associated with blockchain projects. We emphasise the importance of alignment (1) between technology attributes and organisational conditions such as culture, strategy, and infrastructure and (2) between different organisations in decision-making for successful adoption. Notably, 82% of global executives have reported the lack of fair governance rules and clearly defined roles among collaborators as significant barriers to blockchain adoption (Deloitte, 2020). Our study supports this by highlighting the importance of inter-organisational aspects of blockchain adoption, particularly the *collectivity* (i.e., collaboration, coordination, cooperation, and communication among organisations), which stands in the middle of the enabler-barrier continuum (in Figure 5), highlighting its pertinent challenges.

For blockchain service providers, this review offers general principles for developing blockchain-based applications and infrastructure. Addressing inherent tensions on a technological level, such as *traceability vs efficiency*, *transparency vs privacy*, *immutability vs flexibility*, and *security vs scalability*, requires innovative solutions or appropriate application scenarios to better transform blockchain's technical advantages into business value. Beyond technical improvements, trust is essential for promoting widespread blockchain adoption. The failure of Tradelens, a blockchain-based supply chain platform developed by IBM and Maersk, underscores the challenge of fostering trust and cooperation in a highly competitive industry (Holmstad, 2022).

For policymakers, our review identifies some themes with social values in blockchain adoption, such as *privacy*, *security*, and *sustainability*, so government interventions and regulatory legislations are entailed. The immutability of blockchain records, while beneficial for data integrity and security, conflicts with regulations requiring data to be alterable or removable, such as the EU's General Data Protection Regulation (GDPR). Additionally, cross-border blockchain applications with sustainability implications must navigate complex international regulations that vary significantly between jurisdictions. For instance, the Brooklyn Microgrid project, a peer-to-peer energy trading using blockchain, must comply with various local, state, and federal regulations regarding energy distribution and data privacy (Neal, 2022). These regulatory complexities can delay or even prevent the implementation of blockchain solutions, highlighting the need for policymakers' initiatives.

Reference

- Acikgoz, F., Stylos, N., & Lythreatis, S. (2024). Identifying capabilities and constraints in utilizing blockchain technology in hospitality and tourism. *International Journal of Contemporary Hospitality Management*.
- Agi, M. A., & Jha, A. K. (2022). Blockchain technology in the supply chain: An integrated theoretical perspective of organizational adoption. *International Journal of Production Economics*, 247, 108458.
- Agrawal, T. K., Angelis, J., Khilji, W. A., Kalaiarasan, R., & Wiktorsson, M. (2023). Demonstration of a blockchain-based framework using smart contracts for supply chain collaboration. *International journal of production research*, 61(5), 1497-1516.
- Ahi, A. A., Sinkovics, N., Shildibekov, Y., Sinkovics, R. R., & Mehandjiev, N. (2022). Advanced technologies and international business: A multidisciplinary analysis of the literature. *International Business Review*, 31(4), 101967.
- Ali, M. H., Chung, L., Kumar, A., Zailani, S., & Tan, K. H. (2021). A sustainable Blockchain framework for the halal food supply chain: Lessons from Malaysia. *Technological Forecasting and Social Change*, 170, 120870.
- Ali, O., Ally, M., & Dwivedi, Y. (2020). The state of play of blockchain technology in the financial services sector: A systematic literature review. *International Journal of Information Management*, 54, 102199.
- Alkhudary, R., Brusset, X., & Fenies, P. (2020). Blockchain in general management and economics: A systematic literature review. *European Business Review*, 32(4), 765-783.
- Ancillai, C., Sabatini, A., Gatti, M., & Perna, A. (2023). Digital technology and business model innovation: A systematic literature review and future research agenda. *Technological Forecasting and Social Change*, 188, 122307.
- Antons, D., Breidbach, C. F., Joshi, A. M., & Salge, T. O. (2023). Computational literature reviews: Method, algorithms, and roadmap. *Organizational Research Methods*, 26(1), 107-138.
- Ariew, R. (1992). Descartes and the Tree of Knowledge. *Synthese*, 92, 101-116.
- Atewologun, D., Kutzer, R., Doldor, E., Anderson, D., & Sealy, R. (2017). Individual-level foci of identification at work: a systematic review of the literature. *International Journal of Management Reviews*, 19(3), 273-295.
- Bai, C., & Sarkis, J. (2020). A supply chain transparency and sustainability technology appraisal model for blockchain technology. *International Journal of Production Research*, 58(7), 2142-2162.
- Bai, C., Zhu, Q., & Sarkis, J. (2021). Joint blockchain service vendor-platform selection using social network relationships: A multi-provider multi-user decision perspective. *International Journal of Production Economics*, 238, 108165.
- Baker, J. (2012). The technology–organization–environment framework. *Information Systems Theory: Explaining and Predicting Our Digital Society, Vol. 1*, 231-245.
- Balasubramanian, S., Shukla, V., Sethi, J. S., Islam, N., & Saloum, R. (2021). A readiness assessment framework for Blockchain adoption: A healthcare case study. *Technological Forecasting and Social Change*, 165, 120536.
- Balzarova, M., Dyer, C., & Falta, M. (2022). Perceptions of blockchain readiness for fairtrade programmes. *Technological Forecasting and Social Change*, 185, 122086.
- Battisti, E., Graziano, E. A., Leonidou, E., Stylianou, I., & Pereira, V. (2021). International marketing studies in banking and finance: a comprehensive review and integrative framework. *International Marketing Review*, 38(5), 1047-1081.

- Batwa, A., & Norrman, A. (2021). Blockchain technology and trust in supply chain management: A literature review and research agenda. *Operations and Supply Chain Management: An International Journal*, 14(2), 203-220.
- Bonnet, S., & Teuteberg, F. (2024). Decentralized Autonomous Organizations: A Systematic Literature Review and Research Agenda. *International Journal of Innovation and Technology Management (IJITM)*, 21(04), 1-63.
- Brookbanks, M., Parry, G., (2024). The impact of Industry 4.0 technologies on the resilience of established cross border supply chains. *Supply Chain Management: an International Journal*, 29(4), 731–754
- Castañer, X., & Oliveira, N. (2020). Collaboration, coordination, and cooperation among organizations: Establishing the distinctive meanings of these terms through a systematic literature review. *Journal of Management*, 46(6), 965-1001.
- Catalini, C. (2017). How blockchain applications will move beyond finance. *Harvard Business Review*, 2.
- Chandler, J. L., & Kirsch, R. E. (2018). *Critical leadership theory: Integrating transdisciplinary perspectives*: Springer.
- Chang, S. E., Chen, Y. C., & Lu, M. F. (2019). Supply chain re-engineering using blockchain technology: A case of smart contract based tracking process. *Technological Forecasting and Social Change*, 144, 1-11.
- Cho, S., Lee, K., Cheong, A., No, W. G., & Vasarhelyi, M. A. (2021). Chain of values: Examining the economic impacts of blockchain on the value-added tax system. *Journal of Management Information Systems*, 38(2), 288-313.
- Choi, T.-M., & Siqin, T. (2022). Blockchain in logistics and production from Blockchain 1.0 to Blockchain 5.0: An intra-inter-organizational framework. *Transportation Research Part E: Logistics and Transportation Review*, 160, 102653.
- Chowdhury, S., Rodriguez-Espindola, O., Dey, P., & Budhwar, P. (2023). Blockchain technology adoption for managing risks in operations and supply chain management: evidence from the UK. *Annals of Operations Research*, 327(1), 539-574.
- Constantinides, P., Henfridsson, O., & Parker, G. G. (2018). Introduction—platforms and infrastructures in the digital age. *Information Systems Research*, 29(2), 381-400.
- Cozzio, C., Viglia, G., Lemarie, L., & Cerutti, S. (2023). Toward an integration of blockchain technology in the food supply chain. *Journal of Business Research*, 162, 113909.
- Creevey, D., Coughlan, J., & O'Connor, C. (2022). Social media and luxury: A systematic literature review. *International Journal of Management Reviews*, 24(1), 99-129.
- de Jong, S. P., Wardenaar, T., & Horlings, E. (2016). Exploring the promises of transdisciplinary research: A quantitative study of two climate research programmes. *Research Policy*, 45(7), 1397-1409.
- Dehghani, M., Kennedy, R. W., Mashatan, A., Rese, A., & Karavidas, D. (2022). High interest, low adoption. A mixed-method investigation into the factors influencing organisational adoption of blockchain technology. *Journal of Business Research*, 149, 393-411.
- Deloitte. (2020). Deloitte's 2020 Global Blockchain Survey – From promise to reality. Retrieved July 04, 2024, from <https://www2.deloitte.com/content/dam/Deloitte/mt/Documents/technology/2020-global-blockchain-survey.pdf>
- Denter, N. M., Seeger, F., & Moehrle, M. G. (2023). How can Blockchain technology support patent management? A systematic literature review. *International Journal of Information Management*, 68, 102506.
- Denyer, D., & Tranfield, D. (2009). Producing a systematic review.
- Di Vaio, A., Hassan, R., & Palladino, R. (2023). Blockchain technology and gender equality: A systematic literature review. *International Journal of Information Management*, 68, 102517.

- Drummer, D., & Neumann, D. (2020). Is code law? Current legal and technical adoption issues and remedies for blockchain-enabled smart contracts. *Journal of information technology*, 35(4), 337-360.
- Dutta, P., Choi, T.-M., Somani, S., & Butala, R. (2020). Blockchain technology in supply chain operations: Applications, challenges and research opportunities. *Transportation Research Part E: Logistics and Transportation Review*, 142, 102067.
- Dwivedi, A., Agrawal, D., Paul, S. K., & Pratap, S. (2023). Modeling the blockchain readiness challenges for product recovery system. *Annals of Operations Research*, 327(1), 493-537.
- Falcone, E. C., Steelman, Z. R., & Aloysius, J. A. (2021). Understanding managers' reactions to blockchain technologies in the supply chain: The reliable and unbiased software agent. *Journal of Business Logistics*, 42(1), 25-45.
- Fan, Z.-P., Wu, X.-Y., & Cao, B.-B. (2022). Considering the traceability awareness of consumers: Should the supply chain adopt the blockchain technology? *Annals of Operations Research*, 1-24.
- Farnoush, A., Gupta, A., Dolarsara, H. A., Paradice, D., & Rao, S. (2022). Going beyond intent to adopt Blockchain: an analytics approach to understand board member and financial health characteristics. *Annals of Operations Research*, 308(1), 93-123.
- Ferrigno, G., Martin, X., & Battista Dagnino, G. (2023). Explaining the interplay of value creation and value appropriation in strategic alliances: A developmental perspective. *International Journal of Management Reviews*.
- Follmer, K. B., & Jones, K. S. (2018). Mental illness in the workplace: An interdisciplinary review and organizational research agenda. *Journal of Management*, 44(1), 325-351.
- Foss, N. J., Husted, K., & Michailova, S. (2010). Governing knowledge sharing in organizations: Levels of analysis, governance mechanisms, and research directions. *Journal of Management studies*, 47(3), 455-482.
- Fosso Wamba, S., Kala Kamdjoug, J. R., Epie Bawack, R., & Keogh, J. G. (2020). Bitcoin, Blockchain and Fintech: a systematic review and case studies in the supply chain. *Production Planning & Control*, 31(2-3), 115-142.
- Galati, F. (2022). Blockchain adoption in supply networks: a social capital perspective. *Supply Chain Management: An International Journal*, 27(7), 17-32.
- Gan, Q., & Lau, R. Y. K. (2024). Trust in a 'trust-free' system: Blockchain acceptance in the banking and finance sector. *Technological Forecasting and Social Change*, 199, 123050.
- Garg, P., Gupta, B., Chauhan, A. K., Sivarajah, U., Gupta, S., & Modgil, S. (2021). Measuring the perceived benefits of implementing blockchain technology in the banking sector. *Technological forecasting and social change*, 163, 120407.
- Geertz, C. (1963). *Agricultural involution: The processes of ecological change in Indonesia* (Vol. 11): Univ of California Press.
- Gooding, H., Lattanzio, S., Parry, G., Newnes, L., & Alpay, E. (2023). Characterising the transdisciplinary research approach. *Product: Management and Development*, 20(2), 0-0.
- Govindan, K. (2022). Tunneling the barriers of blockchain technology in remanufacturing for achieving sustainable development goals: A circular manufacturing perspective. *Business Strategy and the Environment*, 31(8), 3769-3785.
- Grover, P., Kar, A. K., & Vigneswara Ilavarasan, P. (2018). Blockchain for businesses: A systematic literature review. In *Challenges and Opportunities in the Digital Era: 17th IFIP WG 6.11 Conference on e-Business, e-Services, and e-Society, I3E 2018, Kuwait City, Kuwait, October 30–November 1, 2018, Proceedings 17* (pp. 325-336). Springer International Publishing.

- Guan, W., Ding, W., Zhang, B., Verny, J., & Hao, R. (2023). Do supply chain related factors enhance the prediction accuracy of blockchain adoption? A machine learning approach. *Technological Forecasting and Social Change*, 192, 122552.
- Guo, D., & Zhou, P. (2023). The evolution of financial market infrastructure: from digitalization to tokenization. *International Journal of Innovation and Entrepreneurship*, 2(1).
- Hajian, A., Daneshgar, S., Sadeghi, K., Ojha, D., & Katiyar, G. (2024). From theory to practice: Empirical perspectives on the metaverse's potential. *Technological Forecasting and Social Change*, 201, 123224.
- Harvey Nash. (November 9, 2023). Adoption rate of emerging technologies in organizations worldwide in 2023 [Graph]. In Statista. Retrieved January 01, 2024, from <https://www.statista.com/statistics/661164/worldwide-cio-survey-operational-priorities/>
- Hastig, G. M., & Sodhi, M. S. (2020). Blockchain for supply chain traceability: Business requirements and critical success factors. *Production and Operations Management*, 29(4), 935-954.
- Hew, J.-J., Wong, L.-W., Tan, G. W.-H., Ooi, K.-B., & Lin, B. (2020). The blockchain-based Halal traceability systems: a hype or reality? *Supply Chain Management: An International Journal*, 25(6), 863-879.
- Hojckova, K., Ahlborg, H., Morrison, G. M., & Sandén, B. (2020). Entrepreneurial use of context for technological system creation and expansion: The case of blockchain-based peer-to-peer electricity trading. *Research Policy*, 49(8), 104046.
- Holmstad, D. (2022). Maersk explains Tradelens shutdown: Central players won't share 'necessary data'. Shippingwatch. Retrieved July 04, 2024, from <https://shipping-watch.com/carriers/Container/article14644675.ece>
- Huang, L., Zhen, L., Wang, J., & Zhang, X. (2022). Blockchain implementation for circular supply chain management: Evaluating critical success factors. *Industrial Marketing Management*, 102, 451-464.
- Iansiti, M., & Lakhani, K. R. (2017). The truth about blockchain. *Harvard business review*, 95(1), 118-127.
- Jackson, A., Spiegler, V. L., & Kotiadis, K. (2023). Exploring the potential of blockchain-enabled lean automation in supply chain management: a systematic literature review, classification taxonomy, and future research agenda. *Production Planning & Control*, 1-20.
- Kamble, S. S., Gunasekaran, A., Kumar, V., Belhadi, A., & Foropon, C. (2021). A machine learning based approach for predicting blockchain adoption in supply Chain. *Technological Forecasting and Social Change*, 163, 120465.
- Kamble, S., Gunasekaran, A., & Arha, H. (2019). Understanding the Blockchain technology adoption in supply chains-Indian context. *International Journal of Production Research*, 57(7), 2009-2033.
- Kant, I. (1970). Critique of judgment. In: Newcomb Livraria Press.
- Karakas, S., Acar, A. Z., & Kucukaltan, B. (2021). Blockchain adoption in logistics and supply chain: a literature review and research agenda. *International Journal of Production Research*, 1-24.
- Kayikci, Y., Gozacan-Chase, N., & Rejeb, A. (2024). Blockchain entrepreneurship roles for circular supply chain transition. *Business Strategy and the Environment*, 33(2), 197-222.
- Kayikci, Y., Gozacan-Chase, N., Rejeb, A., & Mathiyazhagan, K. (2022). Critical success factors for implementing blockchain-based circular supply chain. *Business strategy and the environment*, 31(7), 3595-3615.
- Kellermeyer, L., Harnke, B., & Knight, S. (2018). Covidence and rayyan. *Journal of the Medical Library Association: JMLA*, 106(4), 580.

- Kewell, B., Adams, R., & Parry, G. (2017). Blockchain for good? *Strategic change*, 26(5), 429-437.
- Khan, D., Jung, L. T., & Hashmani, M. A. (2021). Systematic literature review of challenges in blockchain scalability. *Applied Sciences*, 11(20), 9372.
- Kirkman, B. L., Lowe, K. B., & Gibson, C. B. (2006). A quarter century of culture's consequences: A review of empirical research incorporating Hofstede's cultural values framework. *Journal of international business studies*, 37, 285-320.
- Konstantinidis, I., Siaminos, G., Timplalexis, C., Zervas, P., Peristeras, V., & Decker, S. (2018). Blockchain for business applications: A systematic literature review. In *Business Information Systems: 21st International Conference, BIS 2018, Berlin, Germany, July 18-20, 2018, Proceedings 21* (pp. 384-399). Springer International Publishing.
- Kouhizadeh, M., Saberi, S., & Sarkis, J. (2021). Blockchain technology and the sustainable supply chain: Theoretically exploring adoption barriers. *International Journal of Production Economics*, 231, 107831.
- Kumar, S., Sahoo, S., Lim, W. M., & Dana, L. P. (2022). Religion as a social shaping force in entrepreneurship and business: Insights from a technology-empowered systematic literature review. *Technological Forecasting and Social Change*, 175, 121393.
- Kurpjuweit, S., Schmidt, C. G., Klöckner, M., & Wagner, S. M. (2021). Blockchain in additive manufacturing and its impact on supply chains. *Journal of Business Logistics*, 42(1), 46-70.
- Li, G., Fan, Z. P., & Wu, X. Y. (2021). The choice strategy of authentication technology for luxury e-commerce platforms in the blockchain era. *IEEE Transactions on Engineering Management*, 70(3), 1239-1252.
- Li, Y., Su A. D., & Mardani, A. (2023). Digital twins and blockchain technology in the industrial Internet of Things (IIoT) using an extended decision support system model: Industry 4.0 barriers perspective. *Technological Forecasting and Social Change*, 195, 122794.
- Liang, T.-P., Kohli, R., Huang, H.-C., & Li, Z.-L. (2021). What drives the adoption of the blockchain technology? A fit-viability perspective. *Journal of Management Information Systems*, 38(2), 314-337.
- Litan, A. (2022). Metaverse, Web3 and Crypto: Separating Blockchain Hype from Reality. Retrieved January 01, 2024, from <https://www.gartner.com/en/newsroom/press-releases/2022-08-30-metaverse-web3-and-crypto-separating-blockchain-hype-from-reality>
- Liu, F., Li, Y., Li, B., Li, J., & Xie, H. (2021). Bitcoin transaction strategy construction based on deep reinforcement learning. *Applied Soft Computing*, 113, 107952.
- Liyanaarachchi, G., Viglia, G., & Kurtaliqi, F. (2024). Addressing challenges of digital transformation with modified blockchain. *Technological Forecasting and Social Change*, 201, 123254.
- Lu, Y., Papagiannidis, S., & Alamanos, E. (2018). Internet of Things: A systematic review of the business literature from the user and organisational perspectives. *Technological Forecasting and Social Change*, 136, 285-297.
- Lumineau, F., Schilke, O., & Wang, W. (2023). Organizational trust in the age of the fourth industrial revolution: Shifts in the form, production, and targets of trust. *Journal of Management Inquiry*, 32(1), 21-34.
- Mačiulienė, M., & Skaržauskienė, A. (2021). Conceptualizing blockchain-based value co-creation: A service science perspective. *Systems Research and Behavioral Science*, 38(3), 330-341.

- Mahmud, H., Islam, A. N., Ahmed, S. I., & Smolander, K. (2022). What influences algorithmic decision-making? A systematic literature review on algorithm aversion. *Technological Forecasting and Social Change*, 175, 121390.
- Majchrzak, A., Jarvenpaa, S. L., & Bagherzadeh, M. (2015). A review of interorganizational collaboration dynamics. *Journal of Management*, 41(5), 1338-1360.
- Majdoulina, I., El Baz, J., & Jebli, F. (2022). Revisiting technological entrepreneurship research: An updated bibliometric analysis of the state of art. *Technological Forecasting and Social Change*, 179, 121589.
- Mallett, O., Wapshott, R., & Vorley, T. (2019). How do regulations affect SMEs? A review of the qualitative evidence and a research agenda. *International Journal of Management Reviews*, 21(3), 294-316.
- Mangla, S. K., Kazançoğlu, Y., Yıldızbaşı, A., Öztürk, C., & Çalık, A. (2022). A conceptual framework for blockchain-based sustainable supply chain and evaluating implementation barriers: A case of the tea supply chain. *Business Strategy and the Environment*, 31(8), 3693-3716.
- Mathivathanan, D., Mathiyazhagan, K., Rana, N. P., Khorana, S., & Dwivedi, Y. K. (2021). Barriers to the adoption of blockchain technology in business supply chains: a total interpretive structural modelling (TISM) approach. *International Journal of Production Research*, 59(11), 3338-3359.
- Misangyi, V. F., Greckhamer, T., Furnari, S., Fiss, P. C., Crilly, D., & Aguilera, R. (2017). Embracing causal complexity: The emergence of a neo-configurational perspective. *Journal of management*, 43(1), 255-282.
- Murray, A., Kuban, S., Josefy, M., & Anderson, J. (2021). Contracting in the smart era: The implications of blockchain and decentralized autonomous organizations for contracting and corporate governance. *Academy of Management Perspectives*, 35(4), 622-641.
- Naef, S., Wagner, S. M., & Saur, C. (2022). Blockchain and network governance: Learning from applications in the supply chain sector. *Production Planning & Control*, 1-15.
- Najafi, B., Najafi, A., & Farahmandian, A. (2023). The Impact of Artificial Intelligence and Blockchain on Six Sigma: A Systematic Literature Review of the Evidence and Implications. *IEEE Transactions on Engineering Management*.
- Narwane, V. S., Raut, R. D., Mangla, S. K., Dora, M., & Narkhede, B. E. (2023). Risks to big data analytics and blockchain technology adoption in supply chains. *Annals of Operations Research*, 327(1), 339-374.
- Nayal, K., Raut, R. D., Narkhede, B. E., Priyadarshinee, P., Panchal, G. B., & Gedam, V. V. (2023). Antecedents for blockchain technology-enabled sustainable agriculture supply chain. *Annals of operations research*, 327(1), 293-337.
- Neal, K. (2022). Disrupting the Utility Model: Blockchain-Based Energy. *EcoBlock*. Retrieved July 04, 2024, from <https://ecoblock.berkeley.edu/blog/disrupting-the-utility-model-blockchain-based-energy/>
- Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic analysis: Striving to meet the trustworthiness criteria. *International journal of qualitative methods*, 16(1), 1609406917733847.
- Ølnes, S., Ubacht, J., & Janssen, M. (2017). Blockchain in government: Benefits and implications of distributed ledger technology for information sharing. *Government information quarterly*, 34(3), 355-364.
- Orji, I. J., Kusi-Sarpong, S., Huang, S., & Vazquez-Brust, D. (2020). Evaluating the factors that influence blockchain adoption in the freight logistics industry. *Transportation Research Part E: Logistics and Transportation Review*, 141, 102025.
- Ostern, N. K., Holotiuk, F., & Moormann, J. (2022). Organizations' approaches to blockchain: A critical realist perspective. *Information & Management*, 59(7), 103552.

- Parmentola, A., Petrillo, A., Tutore, I., & De Felice, F. (2022). Is blockchain able to enhance environmental sustainability? A systematic review and research agenda from the perspective of Sustainable Development Goals (SDGs). *Business Strategy and the Environment*, 31(1), 194-217.
- Patil, K., Ojha, D., Struckell, E. M., & Patel, P. C. (2023). Behavioral drivers of blockchain assimilation in supply chains—A social network theory perspective. *Technological Forecasting and Social Change*, 192, 122578.
- Peng, Y., Chen, X., & Wang, X. (2023). Enhancing supply chain flows through blockchain: a comprehensive literature review. *International Journal of Production Research*, 61(13), 4503-4524.
- Perdana, A., Robb, A., Balachandran, V., & Rohde, F. (2021). Distributed ledger technology: Its evolutionary path and the road ahead. *Information & Management*, 58(3), 103316.
- Pereira, J., Tavalaei, M. M., & Ozalp, H. (2019). Blockchain-based platforms: Decentralized infrastructures and its boundary conditions. *Technological Forecasting and Social Change*, 146, 94-102.
- Queiroz, M. M., Fosso Wamba, S., De Bourmont, M., & Telles, R. (2021). Blockchain adoption in operations and supply chain management: empirical evidence from an emerging economy. *International Journal of Production Research*, 59(20), 6087-6103.
- Radaelli, G., & Sitton-Kent, L. (2016). Middle managers and the translation of new ideas in organizations: a review of micro-practices and contingencies. *International Journal of Management Reviews*, 18(3), 311-332.
- Rana, N. P., Dwivedi, Y. K., & Hughes, D. L. (2022). Analysis of challenges for blockchain adoption within the Indian public sector: An interpretive structural modelling approach. *Information Technology & People*, 35(2), 548-576.
- Rossi, M., Mueller-Bloch, C., Thatcher, J. B., & Beck, R. (2019). Blockchain research in information systems: Current trends and an inclusive future research agenda. *Journal of the Association for Information Systems*, 20(9), 14.
- Saberi, S., Kouhizadeh, M., Sarkis, J., & Shen, L. (2019). Blockchain technology and its relationships to sustainable supply chain management. *International Journal of Production Research*, 57(7), 2117-2135.
- Saheb, T., & Mamaghani, F. H. (2021). Exploring the barriers and organizational values of blockchain adoption in the banking industry. *The Journal of High Technology Management Research*, 32(2), 100417.
- Samad, T. A., Sharma, R., Ganguly, K. K., Wamba, S. F., & Jain, G. (2023). Enablers to the adoption of blockchain technology in logistics supply chains: evidence from an emerging economy. *Annals of Operations Research*, 327(1), 251-291.
- Shahzad, K., Zhang, Q., Ashfaq, M., Zafar, A. U., & Ahmad, B. (2024). Pre-to post-adoption of blockchain technology in supply chain management: Influencing factors and the role of firm size. *Technological Forecasting and Social Change*, 198, 122989.
- Sharma, G. D., Tiwari, A. K., Chopra, R., & Dev, D. (2024). Past, present, and future of block-chain in finance. *Journal of Business Research*, 177, 114640.
- Sharma, M., Sehrawat, R., Daim, T., & Shaygan, A. (2021). Technology assessment: Enabling Blockchain in hospitality and tourism sectors. *Technological Forecasting and Social Change*, 169, 120810.
- Singh, A. K., Kumar, V. P., Shoaib, M., Adebayo, T. S., & Irfan, M. (2023). A strategic roadmap to overcome blockchain technology barriers for sustainable construction: A deep learning-based dual-stage SEM-ANN approach. *Technological Forecasting and Social Change*, 194, 122716.

- Sodhi, M. S., Seyedghorban, Z., Tahernejad, H., & Samson, D. (2022). Why emerging supply chain technologies initially disappoint: Blockchain, IoT, and AI. *Production and Operations Management*, 31(6), 2517-2537.
- Song, Y., Liu, J., Zhang, W., & Li, J. (2023). Blockchain's role in e-commerce sellers' decision-making on information disclosure under competition. *Annals of Operations Research*, 329(1), 1009-1048.
- Stallone, V., Wetzels, M., Mahr, D., & Klaas, M. (2024). Enhancing digital advertising with blockchain technology. *Journal of Interactive Marketing*, 59(1), 76-98.
- Sternberg, H. S., Hofmann, E., & Roeck, D. (2021). The struggle is real: insights from a supply chain blockchain case. *Journal of Business Logistics*, 42(1), 71-87.
- Surucu-Balci, E., Iris, Ç., & Balci, G. (2024). Digital information in maritime supply chains with blockchain and cloud platforms: Supply chain capabilities, barriers, and research opportunities. *Technological Forecasting and Social Change*, 198, 122978.
- Tan, E., Mahula, S., & Cromptvoets, J. (2022). Blockchain governance in the public sector: A conceptual framework for public management. *Government Information Quarterly*, 39(1), 101625.
- Tan, T. M., & Saraniemi, S. (2023). Trust in blockchain-enabled exchanges: Future directions in blockchain marketing. *Journal of the Academy of marketing Science*, 51(4), 914-939.
- Tandon, A., Kaur, P., Mäntymäki, M., & Dhir, A. (2021). Blockchain applications in management: A bibliometric analysis and literature review. *Technological Forecasting and Social Change*, 166, 120649.
- Taplin, S. (2023). Blockchain Technology: Overhyped or Underused? Here's What You Should Know. Retrieved from <https://www.entrepreneur.com/science-technology/blockchain-technology-overhyped-or-underused/441905>
- Tiron-Tudor, A., Deliu, D., Farcane, N., & Dontu, A. (2021). Managing change with and through blockchain in accountancy organizations: A systematic literature review. *Journal of Organizational Change Management*, 34(2), 477-506.
- Tornatzky, L. G., Fleischer, M. (1990). The processes of technological innovation. *Lexington Books, Lexington, MA*.
- Toufaily, E., Zalan, T., & Dhaou, S. B. (2021). A framework of blockchain technology adoption: An investigation of challenges and expected value. *Information & Management*, 58(3), 103444.
- Tranfield, D., Denyer, D., & Smart, P. (2003). Towards a methodology for developing evidence-informed management knowledge by means of systematic review. *British journal of management*, 14(3), 207-222.
- Trequattrini, R., Palmaccio, M., Turco, M., & Manzari, A. (2024). The contribution of blockchain technologies to anti-corruption practices: A systematic literature review. *Business Strategy and the Environment*, 33(1), 4-18.
- Tuladhar, A., Rogerson, M., Engelhart, J., Parry, G., & Altrichter, B. (2024). Blockchain for compliance: An information processing case study of mandatory supply chain transparency in conflict minerals sourcing. *Supply Chain Management: an International Journal*, 29 (4), 755-777.
- Turhan, C., & Akman, I. (2022). Exploring sectoral diversity in the timing of organizational blockchain adoption. *Information Technology & People*, 35(7), 1912-1930.
- Venkatesh, V., Davis, F., & Morris, M. G. (2007). Dead or alive? The development, trajectory and future of technology adoption research. *The Development, Trajectory and Future of Technology Adoption Research* (April 27, 2007). Venkatesh, V., Davis, FD, and Morris, MG "Dead or Alive, 267-286.

- Vu, N., Ghadge, A., & Bourlakis, M. (2023). Blockchain adoption in food supply chains: A review and implementation framework. *Production Planning & Control*, 34(6), 506-523.
- Wamba, S. F., & Queiroz, M. M. (2022). Industry 4.0 and the supply chain digitalisation: a blockchain diffusion perspective. *Production Planning & Control*, 33(2-3), 193-210.
- Wamba, S. F., Queiroz, M. M., & Trinchera, L. (2020). Dynamics between blockchain adoption determinants and supply chain performance: An empirical investigation. *International Journal of Production Economics*, 229, 107791.
- Wang, C., & Hui, K. (2021). Replicator dynamics for involution in an infinite well-mixed population. *Physics Letters A*, 420, 127759.
- Wang, Y., Han, J. H., & Beynon-Davies, P. (2019). Understanding blockchain technology for future supply chains: a systematic literature review and research agenda. *Supply Chain Management: An International Journal*, 24(1), 62-84.
- White, B. (1983). "Agricultural involution" and its critics: Twenty years after. *Bulletin of Concerned Asian Scholars*, 15(2), 18-31.
- Wong, L.-W., Leong, L.-Y., Hew, J.-J., & Ooi, K.-B. (2020a). Time to seize the digital evolution: Adoption of blockchain in operations and supply chain management among Malaysian SMEs. *International Journal of Information Management*, 52, 101997.
- Wong, L.-W., Tan, G. W.-H., Lee, V.-H., Ooi, K.-B., & Sohal, A. (2020b). Unearthing the determinants of Blockchain adoption in supply chain management. *International Journal of Production Research*, 58(7), 2100-2123.
- Xu, X., Tatge, L., Xu, X., & Liu, Y. (2022). Blockchain applications in the supply chain management in German automotive industry. *Production Planning & Control*, 1-15.
- Yadav, V. S., Singh, A., Raut, R. D., & Cheikhrouhou, N. (2021). Blockchain drivers to achieve sustainable food security in the Indian context. *Annals of Operations Research*, 1-39.
- Yan, Z., Ismail, H., Chen, L., Zhao, X., & Wang, L. (2019). The application of big data analytics in optimizing logistics: a developmental perspective review. *Journal of Data, Information and Management*, 1, 33-43.
- Yousefi, S., & Tosarkani, B. M. (2022). An analytical approach for evaluating the impact of blockchain technology on sustainable supply chain performance. *International Journal of Production Economics*, 246, 108429.
- Yun, H., Lee, G., & Kim, D. J. (2019). A chronological review of empirical research on personal information privacy concerns: An analysis of contexts and research constructs. *Information & Management*, 56(4), 570-601.
- Zhang, T., Jia, F., & Chen, L. (2024). Blockchain adoption in supply chains: implications for sustainability. *Production Planning & Control*, 1-24.
- Zhang, X., Liu, T., Rahman, A., & Zhou, L. (2023). Blockchain applications for construction contract management: A systematic literature review. *Journal of Construction Engineering and Management*, 149(1), 03122011.
- Zhang, Y., Gong, B., & Zhou, P. (2024). Centralized Use of Decentralized Technology: Tokenization of Currencies and Assets. *Structural Change and Economic Dynamics*. 71: 15-25.
- Zhang, Z., Ren, D., Lan, Y., & Yang, S. (2022). Price competition and blockchain adoption in retailing markets. *European Journal of Operational Research*, 300(2), 647-660.
- Zhao, G., Liu, S., Lopez, C., Lu, H., Elgueta, S., Chen, H., & Boshkoska, B. M. (2019). Blockchain technology in agri-food value chain management: A synthesis of applications, challenges and future research directions. *Computers in Industry*, 109, 83-99.

Appendix A. Descriptive analysis of the final sample

Table A.1. Journal title, journal ABS ranking, journal field, and papers per journal included in our review

Journal title	ABS	Field	Paper count	%
Int. Bus. Rev. (IBS)	3	IB&AREA	1	1.33
Inf. Manage. (IM)	3	INFO MAN	3	4.00
Inf. Technol. People (ITP)	3	INFO MAN	2	2.67
J. Manage. Inf. Syst. (JMIS)	4	INFO MAN	2	2.67
J. Inf. Technol. (JIT)	4	INFO MAN	1	1.33
Technol. Forecast. Soc. Change (TFSC)	3	INNOV	5	6.67
Ind. Mark. Manage. (IMR)	3	MKT	1	1.33
Comput. Ind. (CI)	3	OPS&TECH	2	2.67
IEEE Trans. Eng. Manage. (IEEE-TEM)	3	OPS&TECH	2	2.67
Int. J. Prod. Econ. (IJPE)	3	OPS&TECH	8	10.67
Int. J. Prod. Res. (IJPR)	3	OPS&TECH	11	14.67
Int. J. Oper. Prod. Manage. (IJOPM)	4	OPS&TECH	1	1.33
J. Bus. Logist. (JBL)	3	OPS&TECH	3	4.00
Prod. Plann. Control (PPC)	3	OPS&TECH	5	6.67
Prod. Oper. Manage. (POM)	4	OPS&TECH	2	2.67
Supply Chain Manage. (SCM)	3	OPS&TECH	6	8.00
Ann. Oper. Res. (AOR)	3	OR&MANSCI	10	13.33
Eur. J. Oper. Res. (EJOR)	4	OR&MANSCI	1	1.33
Manage. Sci. (MS)	4*	OR&MANSCI	1	1.33
Transp. Res. Part E (TRE)	3	SECTOR	6	8.00
Bus. Strategy Environ. (BSE)	3	SOC SCI	2	2.67

Notes: 1) Field is sourced from the ABS list (AJG2021). 2) IBS: International Business Review; IM: Information and Management; ITP: Information Technology and People; JMIS: Journal of Management Information Systems; JIT: Journal of Information Technology; TFSC: Technological Forecasting and Social Change; IMR: Industrial Marketing Management; CI: Computers in Industry; IEEE-TEM: IEEE Transactions on Engineering Management; IJPE: International Journal of Production Economics; IJPR: International Journal of Production Economics; IJOPM: International Journal of Operations and Production Management; JBL: Journal of Business Logistics; PPC: Production Planning and Control; POM: Production and Operations Management; SCM: Supply Chain Management; AOR: Annals of Operations Research; EJOR: European Journal of Operational Research; MS: Management Science; TRE: Transportation Research Part E: Logistics and Transportation Review; BSE: Business Strategy and the Environment. 3) IB&AREA: International Business and Area Studies; INFO MAN: Information Management; INNOV: Innovation and technology change management; MKT: Marketing; OPS&TECH: Operations and Technology Management; OR&MANSCI: Operations Research and Management Science; SECTOR: Sector Studies; SOC SCI: Social Sciences.

Table A.2. Top ten productive authors based on our sample

Rank	Authors	h-index	Total citations	Paper count	Year of first publication	Research focus
1	Sarkis, J	5	3193	5	2018	Adoption factors in sustainable supply chain management and circular economy
2	Fosso Wamba, S	4	538	4	2020	Barriers to blockchain adoption in operations, logistics, and supply chain digitalisation; mainly empirical studies using surveys
3	Kouhizadeh, M	3	2784	3	2018	Barriers to blockchain adoption in sustainable supply chain
4	Queiroz, M. M	3	512	3	2020	Barriers to blockchain adoption in operations and supply chain; mainly empirical papers using surveys
5	Ooi, K. B	3	377	3	2020	Blockchain adoption in Malaysia for operations management, mainly empirical papers using survey
6	Tan, G. W. H	3	377	3	2020	Adoption factors for operations management in Malaysia; mainly empirical papers using surveys
7	Wong, L. W	3	377	3	2020	Adoption factors for operations management in Malaysia; mainly empirical papers using surveys
8	Fan, Z. P	3	211	3	2020	Adoption factors in food supply chain and e-commerce platforms
9	Wu, X. Y	3	211	3	2020	Adoption factors in food supply chain and e-commerce platforms
10	Raut, R. D	3	102	3	2021	Adoption factors in India's food and agriculture sectors

Notes: 1) The h-index measures both the productivity and citation impact of a scholar's publications based on our sample. It is defined as the maximum value of h such that the author has h papers, each cited at least h times. For example, an h-index of 5 means the researcher has 5 papers in our sample, each cited at least 5 times. Paper count and Total citations refer to the author's total number of papers in our sample and corresponding citations as of 30th June 2024. Year of first publication is when the author's first paper in our sample was made available online. Research focus on blockchain adoption is identified through their papers included in our sample. 2) Data source: Crossref, an official Digital Object Identifier (DOI) registration agency of the International DOI Foundation. 3) Our sample includes 214 authors.

Supplementary Material

A. Quantitative measurements

Analysis of themes: To demonstrate the distribution of themes along the TOE dimensions, we computed the TOE ratios for each theme as follows. Denote the total number of factors in theme t of paper p as $N_{p,t}$, where $t = 1, 2, \dots, N_{theme}$ ($N_{theme} = 29$) and $p = 1, 2, \dots, N_{paper}$ ($N_{paper} = 75$). We assign values of 3, 2, 1, or 0 to each dimension of a factor based on its primary, secondary, or tertiary relevance or irrelevance to the given dimension. For example, the factor ‘technological capabilities of the firm’ involves both organisational and technological dimensions, but it is more related to the organisation than technology. Therefore, $O = 3$ (primary dimension), $T = 2$ (secondary dimension), and $E = 0$ (irrelevant). For measurement comparability, we normalise these assigned values and denote the normalised values of d (for factor f belonging to theme t in paper p) as $V_{p,t,f}^{(d)}$, where $d = T, O, E$. In the aforementioned example, this will be $3/(3 + 2 + 0) = 0.6$, $2/(3 + 2 + 0) = 0.4$, and $0/(3 + 2 + 0) = 0$ for O, T, and E dimensions, respectively. The computation formula for TOE shares of each theme $s_t^{(d)}$ can be summarised in equation (1). Similarly, we can calculate the BEnA shares of each theme using the same process for $d = B, En, A$. The only difference is that a given factor can only act as a barrier or an enabler or have an ambiguous effect on blockchain adoption. Therefore, the factor’s value $V_{p,t,f}^{(d)}$ for each BEnA dimension can be either 0 or 1, which is a special case of the normalisation process.

$$s_t^{(d)} = \frac{1}{N_{paper}} \sum_{p=1}^{N_{paper}} \frac{1}{N_{p,t}} \sum_{f=1}^{N_{p,t}} V_{p,t,f}^{(d)} \text{ for } f = 1, 2, \dots, N_{p,t}. \quad (1)$$

Analysis of trends: using *papers* as the unit of analysis, we examined the dispersion of factors along the TOE and BEnA dimensions across years. This shows how attention to these factors changes chronologically. If we let t in the formula (1) represent time (instead of theme), the definition of TOE and BEnA ratios for a given t (i.e., year) is a straightforward extension.

B. The correlation histogram of themes' co-occurrence

We perform correlation analysis to identify the potential co-occurrence (not causation) between themes within a factor, as multiple themes can be relevant to one factor. The values of 1 or 0 are assigned based on the relevance of a specific theme to a specific factor. As shown in **Figure B-1**, the distribution of correlation coefficients resembles a normal distribution. The majority lie within the 95% confidence interval (± 1.96 standard deviations), which suggests that most entries are either weak or statistically insignificant. Additionally, most correlations are negative and statistically insignificant, while only a few are positive and significant. Positive/negative correlations indicate co-occurrence/non-co-occurrence between entries and a factor, accounting for some overlap/non-overlaps between the themes' definitions. A correlation coefficient of 0 signifies no relationship exists between entries. This suggests that most themes are not likely to be combined within one factor. Overall, the identified themes in our paper are adequately distinctive, albeit with some inevitable overlap between themes' definitions.

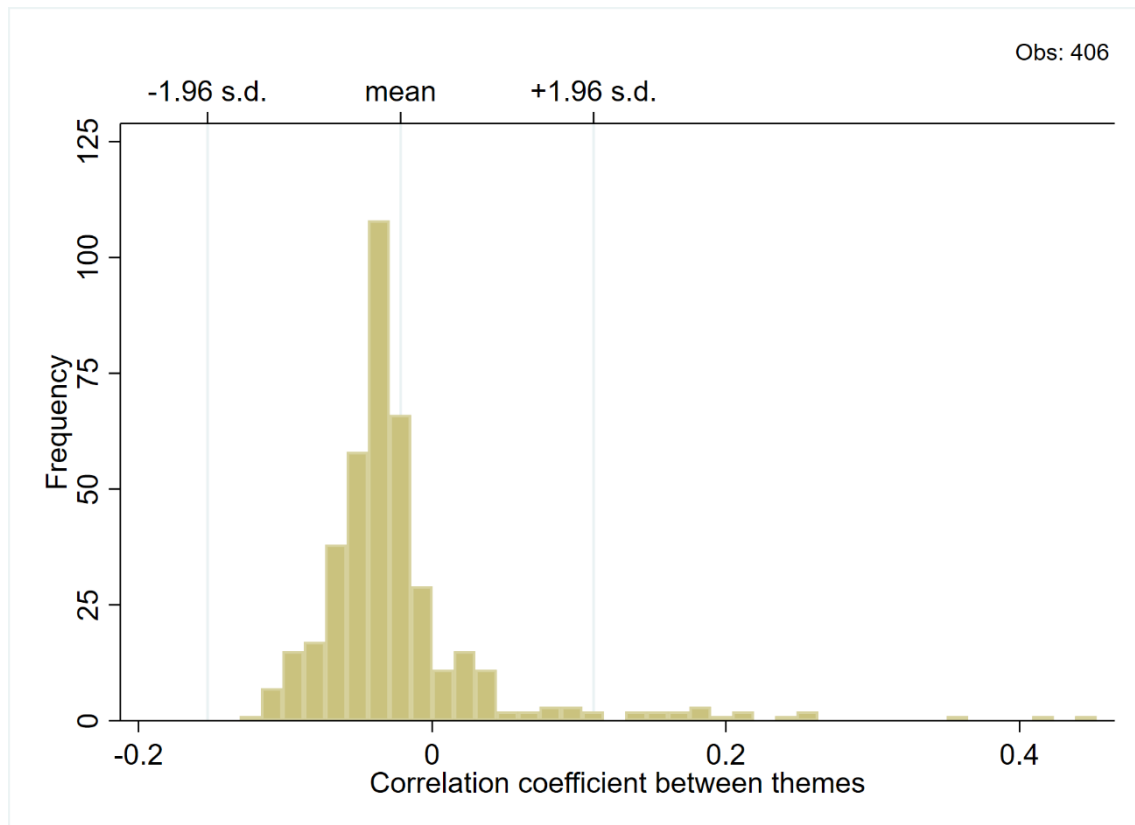


Figure B-1 The histogram of correlation coefficients between themes

C. The summary of theoretical lenses

Table C-1 The list of theoretical lenses used in the review sample (75 papers in total)

Theoretical lens	Frequency
Game theory	11
Technology acceptance model (TAM)	8
Technology-organisation-environment framework (TOE)	7
The Unified Theory of Acceptance and Use of Technology (UTAUT)	5
Diffusion of innovations theory (DOI)	4
Institutional theory	4
Resource-based view (RBV)	3
Dynamic capability (DC)	3
Network theory (NT)/Social network theory (SNT)	2
Sensemaking theory	2
Affordance theory	1
Balanced scorecard perspectives (BSC)	1
Classic diffusion processes	1
Fit-Viability model(FVM)	1
Fuzzy set theory (FS)	1
Regret theory (RT)	1
Innovation adoption theory (IA)	1
Innovation resistance theory (IRT)	1
IOS adoption theory	1
Neutrosophic set theory (NST)	1
Organizational information processing theory	1
Social capital theory	1
Stakeholder theory	1
Design theory	1
Task-Technology Fit (TTF)	1
Hesitant fuzzy set theory (HFS)	1
Theory of motivation	1
Technology readiness index (TRI)	1
The theory of planned behaviour (TPB)	1
Force field theory	1

Notes: The theories are extracted from the 48 papers in our sample, each utilising at least one theoretical lens. The total frequency count exceeds 48 because multiple theories may be used in a single paper. Our review sample includes 75 papers, but not all apply a theoretical lens.

D. Identified factors, aggregated themes, and applied frameworks (TOE & BEnA)

Authors	BEnA	Ambiguous category	Raw factors	TOE_primary	TOE_secondary (if there is)	TOE_tertiary (if there is)	Themes_1	Themes_2	Themes_3	Themes_4	Themes_5
Agi & Jha 2022	E		Technological capabilities (of the firm)	O	T		Capability				
Agi & Jha 2022	E		Knowledge and expertise in using the technology	O	T		Capability	Compatibility			
Agi & Jha 2022	E		Availability of financial resources	O			Capability	Compatibility			
Agi & Jha 2022	E		Management commitment	O			Collectivity	Subjectivity	Compatibility		
Agi & Jha 2022	E		Integrity of data on the blockchain (Trustworthiness–integrity)	T			Trust	Security		Novelty	
Agi & Jha 2022	E		Improved data availability from multiple sources	T			Security	Trust	Connectivity	Transparency	Novelty
Agi & Jha 2022	E		Lower transaction cost (among the members)	T	O	E	Efficiency				
Agi & Jha 2022	E		Ease in implementing process and organizational changes (re-engineeringthe related process)	O	T		Compatibility	Capability	Complexity		
Agi & Jha 2022	E		Availability of credible and accurate data from internal processes (among members)	O	E		Compatibility	Capability	Collectivity		
Agi & Jha 2022	E		Cultural aspects related to the propensity for transparency among the supply chain members	E	O		Compatibility	Collectivity	Subjectivity	Transparency	
Agi & Jha 2022	E		Cooperation between supply chain members to agree on common rules for data disclosure and confidentiality issues	E	O		Collectivity	Compatibility	Transparency		
Agi & Jha 2022	E		Cooperation between supply chain members for process standardization and agreement on the type and level of details of the data to be shared on the blockchain	E	O		Collectivity	Compatibility			
Agi & Jha 2022	E		Cooperation to adopt common supply chain objectives	E	O		Collectivity	Compatibility			
Agi & Jha 2022	E		Developing and harmonizing blockchain technology standards (Blockchain protocols)	T	E		Interoperability	Complexity	Maturity		
Agi & Jha 2022	E		Establishing appropriate and clear governance rules for blockchain platforms	T	E		Interoperability	Complexity	Maturity		
Agi & Jha 2022	E		Establishing rules and standards for interoperability	T	E		Interoperability	Complexity	Maturity		
Agi & Jha 2022	E		Customer interest in the traceability and other product-related data on blockchain	E	T		Traceability	Legitimacy	Transparency	Novelty	
Agi & Jha 2022	E		Industry wide initiatives	E			Legitimacy	Popularity	Collectivity		
Agi & Jha 2022	E		Establishing regulatory framework/regulations	E			Regulatory				
Agi & Jha 2022	E		Government pressure	E			Regulatory				
Ahi et al., 2021	E		Human capital	O			Capability				
Ahi et al., 2021	E		Tangible resources	O			Capability				
Ahi et al., 2021	E		Organisational strategy (align & establish connection with the selected technologies)	E	T		Compatibility	Compatibility			
Ahi et al., 2021	E		Organisational culture (fit)	O	T		Compatibility	Subjectivity			
Ali et al., 2021	B		Data recording using traditional pen and paper (still)	O	T		Capability	Compatibility			
Ali et al., 2021	B		Customised system as per halal requirement (transferring information to a blockchain)	T	E		Complexity	Collectivity	Compatibility		
Ali et al., 2021	B		Unique information (not a standard data format among companies)	T	E		Complexity	Collectivity	Compatibility		
Ali et al., 2021	B		Small economic scale (influence negotiation with actors)	O	E		Capability	Collectivity			
Ali et al., 2021	B		Sufficiency of internal control mechanism (current control systems)	O	T		Feasibility				
Ali et al., 2021	B		No significant value is seen beyond halal	T	O		Feasibility				
Ali et al., 2021	B		Information on halal certificate is sufficient	T	O		Feasibility				
Ali et al., 2021	B		Competitive weapon that is easy to imitate	E	T		Competitvity				
Ali et al., 2021	B		Limited knowledge and untrained	O	T		Capability	Compatibility	Complexity		
Ali et al., 2021	B		Aware but skeptical on return	O	T		Subjectivity	Trust			
Ali et al., 2021	B		Halal - closed system and manageable (within the firm) - regard as competitive advantage	O	E	T	Compatibility				
Ali et al., 2021	B		Risk of incompatibility	O	O		Compatibility				
Ali et al., 2021	B		Employee resistance to change	O			Collectivity	Compatibility			
Ali et al., 2021	B		Overlapping and conflicting meta-system (blockchain-related regulations and laws are required)	E			Regulatory	Legality			
Ali et al., 2021	B		Complex issues regarding food parameters (e.g., safty, quality, integrity, purity) (data input)		O		Complexity	Compatibility			
Ali et al., 2021	B		Some halal and food information is difficult to convey (e.g., farmers cannot update)		E		Complexity	Compatibility			
Ali et al., 2021	B		Halal certificate is voluntary based	E			Regulatory	Legitimacy			
Ali et al., 2021	B		Halal risks exist beyond HACCP (Hazard Analysis and Critical Control Point)	E			Regulatory	Uncertainty			
Ali et al., 2021	E		Extensive Supply Chain Integration (fostering)	E			Regulatory	Collectivity			
Ali et al., 2021	E		Regulations, halal standards, and halal regulatory body	E			Regulatory				
Bai & Sarkis 2020	E		Participation degree	E			Popularity				
Bai & Sarkis 2020	E		Scope of operation, environment and social information (information sharing - the performance measure)	T	E	O	Connectivity	Transparency			
Bai & Sarkis 2020	E		Tracking product components	T	E	O	Traceability	Transparency	Novelty		
Bai & Sarkis 2020	E		Tracking product process	T	E	O	Traceability	Transparency	Novelty		
Bai & Sarkis 2020	E		Tracking product sustainable information	T	E	O	Traceability	Transparency	Novelty		
Bai & Sarkis 2020	E		Participant operations and situations information (traceability)	T	E	O	Traceability	Transparency	Novelty		
Bai & Sarkis 2020	E		Participant sustainability conditions (traceability)	T	E	O	Traceability	Transparency	Novelty		
Bai & Sarkis 2020	A	Contingent	Cost	T	O		Feasibility				
Bai & Sarkis 2020	A	Contingent	Time	T	O		Feasibility				
Bai & Sarkis 2020	E		Adaptability (internal and external)	T	E	O	Adaptability				
Bai & Sarkis 2020	E		Neutrality and interoperability	T			Interoperability				
Bai & Sarkis 2020	E		Throughput capacity	T			Scalability				
Bai & Sarkis 2020	E		Scalability (system performance)	T			Scalability				
Bai & Sarkis 2020	E		Security	T			Security				
Bai & Sarkis 2020	E		Reliability	T			Reliability				
Bai & Sarkis 2020	B		Complexity	T			Complexity				
Bai & Sarkis 2020	E		Partner support	E	O		Collectivity	Popularity			
Bai & Sarkis 2020	A	Indeterminate	Hesitancy (doubt in providing their alternative preferences in the process of group decision making) (hesitant fuzzy set)	O			Subjectivity				
Bai & Sarkis 2020	A	Indeterminate	Regret aversion (preference: regret & rejoice)	O			Subjectivity				
Bai & Sarkis 2020	A	Indeterminate	Varing opinions among decision makers	O	E		Subjectivity	Collectivity			
Bai et al., 2021	E		Participation degree (the ability for participation)	E			Popularity				
Bai et al., 2021	E		Level of expertise	O	T		Capability	Compatibility			
Bai et al., 2021	E		Scope of operation (information sharing)	E			Collectivity				
Bai et al., 2021	E		Security needs (users)	T	E	O	Security				
Bai et al., 2021	E		Acceptance rate	E			Popularity				
Bai et al., 2021	E		Change management	O			Capability	Compatibility			
Bai et al., 2021	E		Information structure (information quality of supply chain actors, current - legacy system)	O	T		Compatibility				
Bai et al., 2021	E		Policy adaptability	O	E		Adaptability	Policy			
Bai et al., 2021	E		Job creation	T	O	E	Sustainability	Legitimacy			
Bai et al., 2021	E		Return on investment	T	O		Feasibility				
Bai et al., 2021	E		Trustworthiness (expertise and reliability of blockchain systems provided by the vendor company)	T	O	E	Trust	Reliability			
Bai et al., 2021	E		Adaptability	O	E		Adaptability				
Bai et al., 2021	E		Interoperability	T			Interoperability				
Bai et al., 2021	E		Scalability	T			Scalability				
Bai et al., 2021	B		Adoption cost (high compared to traditional technology)	T	O		Feasibility				
Bai et al., 2021	B		Operating cost (high compared to traditional technology)	T	O		Feasibility				
Bai et al., 2021	E		Accessibility (e.g., good interfaces)	T	E		Accessibility				

Bai et al., 2021	B		Complexity	T	O		Complexity		
Bai et al., 2021	E		Technical support (Availability of supporting developer tools)	T	E		Accessibility		
Bai et al., 2021	E		Transaction speed	T			Efficiency		
Bai et al., 2021	E		Popularity in the market	E	T		Popularity		
Bai et al., 2021	E		Innovation	T			Novelty		
Bai et al., 2021	E		Blockchain platform maturity	T			Maturity		
Bai et al., 2021	E		Energy efficiency (environmental sustainability consideration)	T	E		Sustainability	Efficiency	
Bai et al., 2021	A	Indeterminate	Partner's impact (Impact degree among the decision makers)	O	E		Subjectivity		
Balasubramanian et al., 2021	E		A clarity on blockchain regulations and laws	E			Regulatory	Legality	
Balasubramanian et al., 2021	E		Innovation culture	O	E		Subjectivity	Compatibility	
Balasubramanian et al., 2021	E		Stakeholder trust (in the blockchain)	O	E	T	Trust		
Balasubramanian et al., 2021	E		Privacy assurance	T	O	E	Privacy		
Balasubramanian et al., 2021	E		Strong support for startups (developing blockchain technologies)	E			Policy		
Balasubramanian et al., 2021	E		Sectors' ability to attract investment	E			Capability		
Balasubramanian et al., 2021	E		Sectors' collaborations	E			Collectivity		
Balci & Surucu-Balci 2021	B		Lack of support from influencing stakeholders	E			Collectivity	Policy	
Balci & Surucu-Balci 2021	B		Lack of government regulations	E			Regulatory		
Balci & Surucu-Balci 2021	B		Lack of knowledge/understanding about BT	O	E	T	Capability		
Balci & Surucu-Balci 2021	B		Privacy/business information sharing concerns in Blockchain platforms	T	O	E	Privacy	Compatibility	Complexity
Balci & Surucu-Balci 2021	B		Lack of trust towards BT	O	E	T	Trust		
Balci & Surucu-Balci 2021	B		Lack of early adopters	E			Popularity		
Balci & Surucu-Balci 2021	B		Perceived resource and initial capital requirement	T	O		Feasibility	Subjectivity	Capability
Balci & Surucu-Balci 2021	B		Resistance of some stakeholders to adopt	E			Collectivity		
Cho et al., 2021	A	Contingent	Adoption costs	T	O		Feasibility		
Cho et al., 2021	A	Contingent	VAT rate (regulatory)	E			Regulatory		
Cho et al., 2021	A	Contingent	Vendors' VAT reporting behavior (honest/dishonest)	E			Trust		
Cho et al., 2021	A	Contingent	Inter-vendor competition (strategic interdependence)	E			Competitiveness		
Cho et al., 2021	A	Contingent	Incentive of entering the blockchain given by the retailer to vendors (e.g., incentive payment)	E	O		Collectivity	Feasibility	
Cho et al., 2021	A	Contingent	Retailer's purchase/retail price (strategic price)	O	E		Competitiveness		
Chod et al., 2020	A	Contingent	Firm's creditworthiness	O			Capability		
Chod et al., 2020	A	Contingent	Firm's market size	O			Capability		
Chod et al., 2020	A	Contingent	Firm's operating costs	O			Capability		
Chod et al., 2020	A	Contingent	Perishability of the firm's inputs	O			Compatibility		
Chod et al., 2020	A	Contingent	Liquidity of the firm's inputs	O			Compatibility		
Chod et al., 2020	A	Contingent	The degree of information asymmetry	E			Uncertainty		
Choi & Siqin 2022	A	Contingent	Cost and benefit	T	O		Feasibility		
Choi & Siqin 2022	E		Business culture (fit)	O	T		Compatibility	Subjectivity	
Choi & Siqin 2022	E		Realizing objectives (require long term vision)	O	T		Compatibility		
Choi & Siqin 2022	E		Business process reengineering (machine intelligence should be incorporated)	O	T		Capability	Compatibility	
Choi & Siqin 2022	E		IT infrastructure (internal)	O	T		Capability		
Choi & Siqin 2022	E		Rules (to government)	O			Capability	Compatibility	
Choi & Siqin 2022	E		Customer requirements (fit the needs of customers)	E	O		Legitimacy		
Choi & Siqin 2022	E		(Inter-organisational) Trust (must be present before)	E			Trust		
Choi & Siqin 2022	E		Information sharing (faithful)	E			Collectivity		
Choi & Siqin 2022	E		Common standard (among supply chain members)	E			Collectivity		
Choi & Siqin 2022	E		Cost and benefit sharing (proper way)	E	T		Feasibility		
Choi & Siqin 2022	E		Incentive alignment	E			Collectivity		
Choi & Siqin 2022	E		Requirements of supply chain partners (fulfill the needs)	E			Legitimacy		
Chowdhury et al., 2022	E		VUCA business environment (Volatility, Uncertainty, Complexity, Ambiguity)	T			Uncertainty		
Chowdhury et al., 2022	E		Perceived usefulness	T	O		Efficiency		
Chowdhury et al., 2022	E		Perceived ease of use	O	T		Complexity		
Chowdhury et al., 2022	E		Resilience	O	E		Adaptability		
De Giovanni 2020	A	Contingent	The price of products: selling/final (strategic price)	O	E		Competitiveness		
De Giovanni 2020	A	Contingent	Marginal production cost	O			Capability		
De Giovanni 2020	E		The collaboration (interactive) between suppliers and retailers	E			Collectivity		
De Giovanni 2020	E		The weighting of blockchain against traditional platform/technology: risk management	T	O	E	Feasibility	Novelty	Adaptability
De Giovanni 2020	E		The weighting of blockchain against traditional platform/technology: save transaction cost (chain members)	T	O	E	Feasibility	Novelty	Efficiency
De Giovanni 2020	A	Contingent	Marginal cost (of adoption)	T	O		Feasibility		
De Giovanni 2020	A	Contingent	Marginal number of tokens that the firms obtain (the recognition and trust that firms acquire by using transparent ways of publishing their transaction)	T	E	O	Trust	Transparency	
Drummer & Neumann 2020	B		Unclear domiciling and jurisdiction	E			Legality		
Drummer & Neumann 2020	B		Violation of securities offerings regulations	E			Regulatory		
Drummer & Neumann 2020	B		Anonymity prevents criminal action	T	E		Privacy		
Drummer & Neumann 2020	B		No legal recourse in case of contract breach	E			Legality		
Drummer & Neumann 2020	B		Violation of consumer rights	E			Legality		
Drummer & Neumann 2020	B		No possibility to reverse void contracts	T			Flexibility		
Drummer & Neumann 2020	B		Discrepancy intent and code (template)	T			Maturity	Interoperability	
Drummer & Neumann 2020	B		Incomplete simulation of future states	T			Maturity		
Drummer & Neumann 2020	B		Potential mismatch between source code and binary code	T			Maturity	Reliability	
Drummer & Neumann 2020	B		Lack of context, lack of judgment	T			Maturity	Reliability	
Drummer & Neumann 2020	B		Reliance on external input (unreliable in terms of availability and accuracy)	T			Reliability	Maturity	
Drummer & Neumann 2020	B		Limited to electronic enforceability	T			Accessibility		
Drummer & Neumann 2020	B		Lack of contract mutability	T			Flexibility		
Drummer & Neumann 2020	B		Lack of arbitration mechanisms	T			Maturity	Reliability	
Drummer & Neumann 2020	B		Limited scalability (public blockchain)	T			Scalability		
Drummer & Neumann 2020	B		Security risks on public blockchains	T			Security		
Drummer & Neumann 2020	B		Privacy concerns	T	O	E	Privacy		
Drummer & Neumann 2020	B		Lack of unifying standards (diverging blockchain standards and protocols)	T			Interoperability	Maturity	
Drummer & Neumann 2020	B		Lack of interoperability (between different blockchain systems, connect different architectures)	T			Interoperability	Maturity	
Drummer & Neumann 2020	B		Code vulnerabilities	T			Security	Maturity	
Drummer & Neumann 2020	B		Network effects	E			Popularity		
Drummer & Neumann 2020	B		Organisational incentives to keep the status quo	O			Subjectivity	Compatibility	
Drummer & Neumann 2020	B		Blockchain reputation	T	O	E	Trust		
Drummer & Neumann 2020	B		Risk aversion and individual incentives	O			Subjectivity		
Drummer & Neumann 2020	B		Knowledge and skill gap	O	T		Capability	Compatibility	

Dutta et al., 2020	B		Lack of understanding of benefits and technicalities involved	O	T		Capability	Compatibility	Complexity
Dutta et al., 2020	B		Limited knowledge of the complex technology	O	T		Complexity	Capability	Compatibility
Dutta et al., 2020	B		Still an emerging technology and hence not many successful implementation references are available	E	T	O	Popularity	Maturity	
Dutta et al., 2020	B		A perception that most problems can be solved using traditional information and database systems and there is no need for blockchain	O	T		Subjectivity	Feasibility	
Dutta et al., 2020	B		Assuring integrity of input data is a difficult task	T	O		Reliability	Complexity	
Dutta et al., 2020	B		Convincing all stakeholders to share information is a challenge	E	O		Collectivity	Capability	
Dutta et al., 2020	B		Organization of such huge amounts of data and making an efficient use of it is a problem	O			Capability		
Dutta et al., 2020	B		Standardization of blockchain system	T			Interoperability		
Dutta et al., 2020	B		Difficulty and complexity caused by the interoperability	T	O	E	Complexity	Interoperability	
Dutta et al., 2020	B		Cost (costly and time consuming)	T	O		Feasibility		
Dutta et al., 2020	B		Privacy needs to be ensured as the technology is still very immature and vulnerable	T	O		Privacy	Maturity	
Dutta et al., 2020	B		Security needs to be ensured as the technology is still very immature and vulnerable	T	O		Security	Maturity	
Dutta et al., 2020	B		Regulatory uncertainty	E			Uncertainty	Regulatory	
Dutta et al., 2020	B		Potential for organization wide hit if the system fails	T	O	E	Uncertainty	Reliability	
Dutta et al., 2020	B		Blockchain should be applied selectively after weighing in the economics of implementation in terms of both cost and risk	T	O		Feasibility		
Dutta et al., 2020	B		It is a huge change in all aspects of an existing business	O	E	T	Compatibility		
Dutta et al., 2020	B		Large numbers of stakeholders are involved and changing age old mind-sets, culture and work methodologies are a big issue	O	E	T	Compatibility		
Dutta et al., 2020	B		There can be conflicting objectives for different stakeholders	E	O		Collectivity		
Dutta et al., 2020	B		Intermediators involved at various levels might be eliminated which can create rifts	E	O		Collectivity	Compatibility	
Dutta et al., 2020	B		Uncertainty and lack of awareness hampers acceptance	E	O		Uncertainty	Subjectivity	
Dutta et al., 2020	B		A perception that block chain implementation might lead to loss of jobs	T	O	E	Subjectivity	Sustainability	
Dwivedi et al., 2022	B		Inadequate mechanism for BCT pursuit in PRS	O	T		Compatibility		
Dwivedi et al., 2022	B		Challenges in assimilating PRS and BC (organisational effectiveness)	O	T		Compatibility	Capability	
Dwivedi et al., 2022	B		Lack of customer cognizance towards PRS and BCT	E			Popularity	Legitimacy	Uncertainty
Dwivedi et al., 2022	B		Infantile challenges of BCT: technical	T			Maturity		
Dwivedi et al., 2022	B		High costs linked with BCT implementation	T	O		Feasibility		
Dwivedi et al., 2022	B		Reluctant to convert to a new arrangement (inter-organisational technology)	O	T	E	Subjectivity	Compatibility	
Dwivedi et al., 2022	B		Lack of organizational policies and frameworks for BCT adoption	O	T		Compatibility		
Dwivedi et al., 2022	B		Inadequate financing for PRS exercises	O			Capability		
Dwivedi et al., 2022	B		Inadequate organizational structures to support PRS (e.g., top management support, efficient organisational structure)	O			Capability		
Dwivedi et al., 2022	B		Lack of IT arrangements to assist PRS	T			Capability		
Dwivedi et al., 2022	B		Security challenges to BCT implementation (privacy and security)	T	O	E	Privacy	Security	
Dwivedi et al., 2022	B		Lack of technological maturity towards PRSs	T			Maturity		
Dwivedi et al., 2022	B		Inadequate standards for PRS operations	T	E		Collectivity		
Dwivedi et al., 2022	B		Market impediments and uncertainty (demand uncertainty)	E			Uncertainty	Popularity	
Dwivedi et al., 2022	B		Traceability and visibility concerns with BCT adoption (across partners)	T	E		Traceability		Transparency
Dwivedi et al., 2022	B		Limited scalability with BCT's implementation in PRS (for organisations and customers)	T	O	E	Scalability		
Dwivedi et al., 2022	B		Lack of awareness and expertise towards BCT adoption	O	T		Capability	Compatibility	Complexity
Dwivedi et al., 2022	B		Data processing and storage challenges with BCT in PRS	T	O		Scalability		
Dwivedi et al., 2022	B		Privacy challenges with BCT (transaction-specific and customer)	T	E	O	Privacy		
Dwivedi et al., 2022	B		Lack of governance and standards (governmental policies and standards)	E			Policy		
Falcone et al., 2021	E		Blockchain Design features (i.e., DLT and P2P)	T			Novelty	Trust	
Falcone et al., 2021	A	Insignificant	Perceived risk	T	O		Subjectivity		
Falcone et al., 2021	E		Trustworthiness-competence	T	O		Trust	Reliability	Maturity
Falcone et al., 2021	A	Insignificant	Trustworthiness-integrity (with trading partner)	T	O	E	Trust	Reliability	
Falcone et al., 2021	A	Insignificant	Procedure justice (fair treatment of all trading partners)	T	E		Sustainability		
Falcone et al., 2021	E		Distributive justice (fair contribution/rewards)	T	E		Sustainability		
Falcone et al., 2021	A	Insignificant	Interactional justice (day-to-day communication/interaction to be equal and fair)	T	E		Sustainability	Connectivity	
Falcone et al., 2021	A	Indeterminate	Perceived usefulness	T	O		Efficiency		
Falcone et al., 2021	A	Indeterminate	Personal innovativeness (preference towards innovation)	O	T		Subjectivity	Compatibility	
Falcone et al., 2021	A	Indeterminate	Previous knowledge (e.g., formal training within organisation)	O	T		Compatibility	Capability	
Fan et al., 2022	A	Contingent	The traceability awareness of consumers	T	E		Traceability	Legitimacy	
Fan et al., 2022	A	Contingent	The cost of using blockchain	T	O		Feasibility		
Fan et al., 2022	A	Contingent	The sharing proportions of the cost of using the blockchain technology (supplier, manufacturer, retailer)	T	E		Feasibility		
Fan et al., 2022	A	Contingent	The wholesale/retail price (strategic price)	O	E		Competitiveness		
Fan et al., 2022	A	Contingent	The perceived value of consumers for the product (random variable)	E			Uncertainty		
Fan et al., 2022	A	Contingent	The unit production cost of the supplier/manufacturer	O			Capability		
Farnoush et al., 2022	A	Indeterminate	Investment	O			Capability		
Farnoush et al., 2022	A	Contingent	Earning Quality (long-term indicator)	O			Capability		
Farnoush et al., 2022	A	Indeterminate	Margin Growth	O			Capability		
Farnoush et al., 2022	A	Indeterminate	Earning Management	O			Capability		
Farnoush et al., 2022	A	Contingent	Earnings-Per-Share Growth (long-term indicator)	O			Capability		
Farnoush et al., 2022	A	Indeterminate	Director Gender Diversity	O			Capability		
Farnoush et al., 2022	A	Contingent	Network Size (larger)	O			Capability		
Farnoush et al., 2022	A	Contingent	Qualification (greater)	O			Capability		
Farnoush et al., 2022	A	Contingent	Time on Board (longer)	O			Capability		
Farnoush et al., 2022	A	Contingent	Time to Retirement (longer)	O			Capability		
Galati 2022	E		Relational capital (accessible resources on the social network between firms)	E			Collectivity	Capability	
Galati 2022	E		Cognitive capital (shared vision among supply chain partners)	E			Collectivity	Capability	
Galati 2022	A	Contingent	The (competitive) opportunity to act as "Tertius Gaudens" or as "Tertius lungens" information brokers in supply networks	O	E		Compatibility	Competitiveness	
Giri & Manohar, 2021	E		Public blockchain-based collaboration	T	E	O	Novelty		
Giri & Manohar, 2021	E		Private blockchain-based collaboration	T	E	O	Novelty		
Giri & Manohar, 2021	E		Perceived ease of use	T	O		Complexity		
Giri & Manohar, 2021	E		Perceived usefulness	T	O		Efficiency		
Govindan 2022	B		Lack of legal security	E			Legality		
Govindan 2022	B		Lack of business model and road map	T			Capability		
Govindan 2022	B		Lack of standardization and generalization (different confidentiality measures, protocols, coding languages, and communication mechanisms)	O	E		Interoperability	Maturity	Complexity
Govindan 2022	B		Scaling of technology	T			Scalability		
Govindan 2022	B		Operational challenges (performance monitoring, uncertainty)	O	E		Capability	Uncertainty	
Govindan 2022	B		Difficulties in selection of sharing data (which data should be shared)	O	E		Capability	Collectivity	
Govindan 2022	B		Lack of awareness on blockchain risk (from the demand side - customers)	O	T	E	Subjectivity	Uncertainty	Maturity
Govindan 2022	B		Lack of value chain actor's engagement	T			Collectivity		
Govindan 2022	B		Lack of tools and apps for blockchain integration in remanufacturing (need ease and convenience)	E	E	O	Accessibility	Complexity	
Govindan 2022	B		Lack of stakeholder awareness	O	E		Subjectivity		

Govindan et al., 2022	B		Constraints resulted from financial issues: high set-up cost with low rate of return	T	O			Feasibility			
Govindan et al., 2022	B		Absence of external stakeholders (the government, shareholders, and investors)	E				Collectivity	Regulatory	Policy	
Govindan et al., 2022	B		Absence of trust: trust between parties in data rewriting	E				Trust	Collectivity		
Govindan et al., 2022	B		Market competition and uncertainty	E				Uncertainty	Compettivity		
Govindan et al., 2022	B		Absence of awareness (of BT and its advantages)	E				Popularity	Uncertainty		
Govindan et al., 2022	B		Security issues (data privacy - the major one)	E	T			Privacy	Security		
Govindan et al., 2022	B		Information disclosure issues (different privacy needs and information policies)	E				Privacy	Collectivity		
Govindan et al., 2022	B		Absence of management support and commitment	O				Collectivity	Subjectivity	Compatibility	
Govindan et al., 2022	B		Resistance of organization members	O				Collectivity	Compatibility		
Govindan et al., 2022	B		Problems in communication, coordination, and collaboration: collaboration within organisation	O				Collectivity			
Govindan et al., 2022	B		Challenges in integrating existing structures into BT	O	T			Compatibility	Capability		
Govindan et al., 2022	B		Lack of organizational culture for changing	O				Compatibility	Subjectivity		
Govindan et al., 2022	B		Absence of standardization (industry)	E				Collectivity	Popularity		
Govindan et al., 2022	B		Issues related to immutability in BT (cannot be retrieved)	T				Flexibility			
Govindan et al., 2022	B		Absence of expertise and knowledge	O	T			Capability	Compatibility	Complexity	
Govindan et al., 2022	B		Uncertain government policies	E				Uncertainty	Policy		
Govindan et al., 2022	B		Scalability issues	T				Scalability			
Govindan et al., 2022	B		Absence of BT infrastructure (limited access to appropriate facilities, e.g., internet, information technology infrastructure)	T	E			Accessibility			
Govindan et al., 2022	B		Technology immaturity	T				Maturity			
Hastig & Sodhi 2020	E		Technical capability	O	T			Capability			
Hastig & Sodhi 2020	E		Organizational readiness (to embrace the technology)	O	T			Capability	Compatibility		
Hastig & Sodhi 2020	E		Other capabilities for change	O				Capability			
Hastig & Sodhi 2020	E		Goal alignment	E				Collectivity			
Hastig & Sodhi 2020	E		Partnership trust (Skepticism ...)	E				Trust	Subjectivity	Collectivity	
Hastig & Sodhi 2020	E		Stakeholder acceptance (participation, customer engagement, value chain cooperation)	E				Popularity	Collectivity	Legitimacy	
Hastig & Sodhi 2020	E		Technology maturity	T				Maturity			
Hastig & Sodhi 2020	E		Data security	T	E		O	Security			
Hastig & Sodhi 2020	E		Technological feasibility	T	O			Feasibility			
Hastig & Sodhi 2020	E		Information capture (timely, accurate data collection/storing/processing)	T	E		O	Connectivity	Reliability		
Hastig & Sodhi 2020	E		Operational model (supply chain information; process standardization for the systems between parties)	E	T			Collectivity	Interoperability		
Hastig & Sodhi 2020	E		Internal leadership within firm	O				Collectivity			
Hastig & Sodhi 2020	E		External leadership with stakeholders and in supply chain	O	E			Collectivity			
Hastig & Sodhi 2020	E		Legal framework	E				Legality			
Hastig & Sodhi 2020	E		Information stewardship (by regulatory bodies)	T				Regulatory			
Hew et al., 2020	E		Materials	O				Compatibility			
Hew et al., 2020	E		Production process	O				Compatibility			
Hew et al., 2020	E		Staffing	O				Compatibility			
Hew et al., 2020	E		Storage and transportation	O				Compatibility			
Hew et al., 2020	E		Coercive pressures (industry association, main suppliers, main customer)	E				Legitimacy			
Hew et al., 2020	E		Mimetic pressures (imitate other successful firms' strategies, usually the competitor)	E				Compettivity			
Hew et al., 2020	E		Normative pressures (e.g., industry association)	E				Legitimacy			
Hew et al., 2020	E		Compatibility	T	O			Compatibility			
Hew et al., 2020	B		Complexity	T	O			Complexity			
Hew et al., 2020	E		Relative advantage	T	O			Novelty			
Hew et al., 2020	A	Insignificant	Firm age	O				Capability			
Hew et al., 2020	A	Insignificant	Firm size	O				Capability			
Hopkins 2021	A	Contingent	Organisational size	O				Capability			
Hopkins 2021	A	Indeterminate	Sector difference	O	E			Compatibility			
Huang et al., 2022	E		Technology maturity	T				Maturity			
Huang et al., 2022	E		Data security	T	E		O	Security			
Huang et al., 2022	E		Technological feasibility	T	O			Feasibility			
Huang et al., 2022	E		Technical capability	O	T			Capability			
Huang et al., 2022	E		Organisational readiness	O	T			Capability	Compatibility		
Huang et al., 2022	E		Other capabilities for change	O				Capability			
Huang et al., 2022	E		Internal leadership with firm	O				Collectivity			
Huang et al., 2022	E		External leadership with stakeholders and in supply chain	O	E			Collectivity			
Huang et al., 2022	E		Goal alignment	E				Collectivity			
Huang et al., 2022	E		Partnership trust (Skepticism ...)	E				Trust	Subjectivity	Collectivity	
Huang et al., 2022	E		Stakeholder buy-in	E				Popularity	Collectivity		
Huang et al., 2022	E		Cost control (of the input cost of the two-chain integration)	O	T			Capability			
Huang et al., 2022	E		Government policies	E				Policy			
Huang et al., 2022	E		Risk management	O	E			Adaptability			
Huang et al., 2022	E		Information capture (timely, accurate data collection/storing/processing)	T	E		O	Connectivity	Reliability		
Huang et al., 2022	E		Operational model (data management and information maintenance among the suppliers and partners)	E				Collectivity			
Huang et al., 2022	E		Knowledge training	O	T			Capability	Compatibility		
Huang et al., 2022	E		Circular approach (throughout the supply chain)	E				Collectivity			
Huang et al., 2022	E		Information disclosure (required by circular management)	E				Legitimacy			
Ji et al., 2022	A	Contingent	Consumer sensitivity to blockchain technology: consumer traceability awareness (and authenticity)	E	T			Traceability	Legitimacy	Trust	
Ji et al., 2022	A	Contingent	Wholesale/retail price (strategic price)	O	E			Compettivity			
Ji et al., 2022	A	Contingent	Market competition (The degree of substitution between the products)	E				Compettivity			
Ji et al., 2022	A	Contingent	The transportation cost	O	E			Capability			
Kamble et al., 2019	A	Insignificant	Discomfort (the feeling of lack of control in implementation, e.g., it will be difficult to understand and apply ...)	O	T			Subjectivity	Complexity		
Kamble et al., 2019	A	Insignificant	Insecurity (worries or distrust for the technology and suspicion towards its capability)	O	T			Trust	Subjectivity		
Kamble et al., 2019	E		Perceived usefulness	T	O			Efficiency			
Kamble et al., 2019	E		Perceived ease of use	T	O			Complexity			
Kamble et al., 2019	E		Attitude towards use	O	T			Subjectivity			
Kamble et al., 2019	E		Subjective norms (important others' influence)	O	E			Subjectivity	Legitimacy		
Kamble et al., 2019	A	Insignificant	Perceived behavioral control (people's perceptions of their ability to perform BT)	O	T			Subjectivity	Capability	Compatibility	
Kamble et al., 2021	E		Relative advantage	T	O			Novelty			
Kamble et al., 2021	A	Insignificant	Information security	T	E		O	Security			
Kamble et al., 2021	E		Technical know-how	O	T			Capability	Compatibility		
Kamble et al., 2021	E		Perceived financial benefits (implementation and operational costs and monetary benefit)	T	O			Feasibility			
Kamble et al., 2021	E		Compatibility	T	O			Compatibility			
Kamble et al., 2021	B		Complexity	T	O			Complexity			

Kamble et al., 2021	A	Indeterminate	Organisational readiness	O	T		Capability	Compatibility	
Kamble et al., 2021	E		Top management support	O			Collectivity	Subjectivity	Compatibility
Kamble et al., 2021	E		Training and education	O	T		Capability	Compatibility	
Kamble et al., 2021	E		Competitive pressure	E			Competitvity		
Kamble et al., 2021	E		Partner readiness	E			Collectivity		
Kamble et al., 2021	E		Perceived usefulness	T	O		Efficiency		
Kamble et al., 2021	E		Perceived ease of use	T	O		Complexity		
Karakas et al., 2021	E		The digitalisation of paper-based processes	T	O	E	Efficiency		
Karakas et al., 2021	E		Efficient decision-making mechanisms	T	O	E	Efficiency		
Karakas et al., 2021	E		Improved SC coordination	T	E	O	Efficiency	Connectivity	
Karakas et al., 2021	E		Flexibility (more adaptable)	T	O	E	Efficiency	Adaptability	
Karakas et al., 2021	E		Transparency and real-time visibility	T	E	O	Transparency	Traceability	
Karakas et al., 2021	E		Environmental and social sustainability (through traceability and product provenance)	T	E	O	Sustainability	Traceability	
Karakas et al., 2021	B		Lack of legal and regulatory infrastructure	E			Legality	Regulatory	
Karakas et al., 2021	B		Organisations' commitment to digital transformation (intra-organisational/difficulty)	O	T		Collectivity	Subjectivity	Compatibility
Karakas et al., 2021	B		Investment costs	T	O		Feasibility		
Karakas et al., 2021	B		Lack of skilled labour	O	T		Capability	Compatibility	Complexity
Karakas et al., 2021	B		Lack of technical knowledge	O	T		Capability	Compatibility	Complexity
Karakas et al., 2021	B		Interoperability and standardisation (between different team members in the SC)	T	E		Interoperability	Collectivity	
Karakas et al., 2021	A	Contingent	Structure of the SC network (traditional, reactive, or data-driven)	E			Compatibility		
Karamchandani et al., 2021	B		Integration intensity (the level of integration of an organisation within itself and with its supply chain members)	O	E		Collectivity		
Karamchandani et al., 2021	E		IT integration	T	O	E	Interoperability	Collectivity	
Karamchandani et al., 2021	A	Contingent	Organisational size	O			Capability		
Karamchandani et al., 2021	E		Geographical dispersion (e.g., offices - number of countries)	O			Capability		
Karamchandani et al., 2021	A	Insignificant	Improvement in customer relationship	T	E	O	Trust		
Karamchandani et al., 2021	A	Insignificant	Improvement in information quality (accuracy, adequacy, reliability, completeness and timeliness)	T	E	O	Security	Reliability	Connectivity
Karamchandani et al., 2021	E		Improvement in mass customisation	T	E	O	Efficiency		
Karamchandani et al., 2021	A	Insignificant	Improvement in product quality	T	O		Trust	Traceability	
Karamchandani et al., 2021	A	Insignificant	Improvement in supply uncertainty	O	E		Adaptability	Connectivity	Uncertainty
Karamchandani et al., 2021	E		Improvement in delivery reliability (no delay)	T	E	O	Trust	Traceability	Connectivity
Kouhizadeh et al., 2020	E		Information exchange and monitoring characteristics of blockchain technology: transparency (add to supply chain networks)	T	E		Transparency		
Kouhizadeh et al., 2020	E		Information exchange and monitoring characteristics of blockchain technology: traceability	T	E		Traceability	Novelty	
Kouhizadeh et al., 2020	E		Information exchange and monitoring characteristics of blockchain technology	T	E	O	Traceability	Transparency	Connectivity
Kouhizadeh et al., 2020	E		Information exchange and monitoring characteristics of blockchain technology: security	T	E	O	Security		
Kouhizadeh et al., 2020	E		Information exchange and monitoring characteristics of blockchain technology: smart execution (save cost and time and minimise the communication problems)	T	E	O	Efficiency		
Kouhizadeh et al., 2020	E		Regulatory or institutional support	E			Regulatory		
Kouhizadeh et al., 2020	E		Industrial regulations (is needed to drive)	E			Legitimacy		
Kouhizadeh et al., 2021	B		Security challenge (hacking, inaccurate information dispersal and access to sensitive information)	T	E	O	Security		
Kouhizadeh et al., 2021	B		Access to technology (Internet, and IT infrastructure of organisation)	T	E		Accessibility		
Kouhizadeh et al., 2021	B		The negative perception toward technology	O	E	T	Subjectivity	Trust	
Kouhizadeh et al., 2021	B		Immutability challenge of blockchain technology (incorrect record)	T			Flexibility		
Kouhizadeh et al., 2021	B		Immaturity of technology	T			Maturity		
Kouhizadeh et al., 2021	B		Financial constraints	O			Capability	Compatibility	
Kouhizadeh et al., 2021	B		Lack of management commitment and support	O			Collectivity	Subjectivity	Compatibility
Kouhizadeh et al., 2021	B		Lack of new organizational policies for using blockchain technology	O			Compatibility		
Kouhizadeh et al., 2021	B		Lack of knowledge and expertise	O			Capability	Compatibility	Complexity
Kouhizadeh et al., 2021	B		Difficulty in changing organizational culture	O			Compatibility		
Kouhizadeh et al., 2021	B		Hesitation to convert to new systems	O	T		Subjectivity		
Kouhizadeh et al., 2021	B		Lack of tools for blockchain technology implementation in sustainable supply chains	T	E	O	Accessibility		
Kouhizadeh et al., 2021	B		Lack of customers' awareness and tendency about sustainability and blockchain technology	E			Sustainability	Popularity	
Kouhizadeh et al., 2021	B		Problems in collaboration, communication and coordination in the supply chain	E			Collectivity		
Kouhizadeh et al., 2021	B		Challenge of information disclosure policy between partners in the supply chain	E			Collectivity		
Kouhizadeh et al., 2021	B		Challenges in integrating sustainable practices and blockchain technology through SCM	E	O	T	Compatibility	Capability	Collectivity
Kouhizadeh et al., 2021	B		Cultural differences of supply chain partners	E			Collectivity	Subjectivity	
Kouhizadeh et al., 2021	B		Lack of governmental policies	E			Policy		
Kouhizadeh et al., 2021	B		Market competition and uncertainty	E			Competitvity	Uncertainty	
Kouhizadeh et al., 2021	B		Lack of external stakeholders' involvement	E			Collectivity	Popularity	
Kouhizadeh et al., 2021	B		Lack of industry involvement in blockchain adoption and ethical and safe practices	E			Collectivity	Popularity	Legitimacy
Kouhizadeh et al., 2021	B		Lack of rewards and incentives (by government and professional organisations)	E			Policy	Popularity	
Kurpjuweit et al., 2021	E		IP rights protection	T	O	E	Security		
Kurpjuweit et al., 2021	E		IP rights distribution	T	O	E	Security		
Kurpjuweit et al., 2021	E		IP rights enforcement	T	O	E	Security		
Kurpjuweit et al., 2021	E		Anti-counterfeit	T	E	O	Trust	Security	
Kurpjuweit et al., 2021	E		Transparency	T	E	O	Transparency		
Kurpjuweit et al., 2021	E		Traceability	T	E	O	Traceability		
Kurpjuweit et al., 2021	E		Andit trail (trust the printed product)	T	O	E	Traceability	Trust	
Kurpjuweit et al., 2021	E		Process efficiency	T	O	E	Efficiency		
Kurpjuweit et al., 2021	E		Product development	T	O		Efficiency		
Kurpjuweit et al., 2021	E		Protection against data manipulation	T	O	E	Security		
Kurpjuweit et al., 2021	E		Detection of data theft	T	O	E	Security		
Kurpjuweit et al., 2021	B		Blockchain performance - scalability	T			Scalability		
Kurpjuweit et al., 2021	B		Blockchain configuration (e.g., private or public)	T			Novelty		
Kurpjuweit et al., 2021	B		Blockchain architecture (integrating so many different components)	T	O		Complexity		
Kurpjuweit et al., 2021	B		Integration in IT landscape (e.g., good interfaces)	T	E	O	Accessibility		
Kurpjuweit et al., 2021	B		Interoperability	T			Interoperability	Collectivity	
Kurpjuweit et al., 2021	B		Standardization (different blockchain forms, define the core collectively)	T	E		Interoperability		
Kurpjuweit et al., 2021	B		Privacy	T	E	O	Privacy		
Kurpjuweit et al., 2021	B		Security	T	E	O	Security		
Kurpjuweit et al., 2021	B		Handling of further IP processing (data security concern)	T	O		Security		
Kurpjuweit et al., 2021	B		Offchain data storage and transfer (huge files)	T	O		Feasibility		
Kurpjuweit et al., 2021	B		Product tagging (prefer simple solution)	T	O		Complexity	Feasibility	
Kurpjuweit et al., 2021	B		Data collection and preparation (if feasible)	T	O		Feasibility		
Kurpjuweit et al., 2021	B		Implementation costs	T	O		Feasibility		
Kurpjuweit et al., 2021	B		User resistance	E			Popularity		

Kurpjuweit et al., 2021	B		Lack of top-management support	O			Collectivity	Subjectivity	Compatibility
Kurpjuweit et al., 2021	B		Lack of technical expertise	O	T		Capability	Compatibility	Complexity
Kurpjuweit et al., 2021	B		Lack of supportive culture	O			Compatibility	Subjectivity	
Kurpjuweit et al., 2021	B		Labor market availability (blockchain developers are very rare, in high demand)	E	O	T	Feasibility		
Kurpjuweit et al., 2021	B		Speed of technological developments	T	E		Maturity		
Kurpjuweit et al., 2021	B		Regulatory conditions (associated uncertainty)	E			Uncertainty	Regulatory	
Kurpjuweit et al., 2021	B		Cooperation commitment (involve different stakeholders)	E			Collectivity		
Kurpjuweit et al., 2021	B		Coordination complexity	E			Collectivity	Complexity	
Kurpjuweit et al., 2021	B		Conflicts of interest	E			Collectivity		
Kurpjuweit et al., 2021	B		Governance (interorganisational governance structure)	E			Collectivity		
Li et al., 2021	A	Contingent	Cost difference between blockchain-based and manual authentication: authentication, operation	T	O		Feasibility		
Li et al., 2021	A	Contingent	Competition intensity between two platforms	E			Competitiveness		
Li et al., 2021	A	Contingent	The order quantity of luxury goods on the platform in the monopoly/duopoly market (strategic quantity)	O	E		Competitiveness		
Li et al., 2021	E		The authentication defects caused by adopting manual technology	T			Feasibility	Trust	
Li et al., 2021	A	Contingent	The blockchain technology investment cost	T	O		Feasibility		
Liang et al., 2021	A	Insignificant	Data security (the need of information management)	T	O		Security	Compatibility	
Liang et al., 2021	E		Data processing (speed, the need of efficiency)	T	O		Efficiency	Compatibility	
Liang et al., 2021	E		Compatibility needs	E	O		Compatibility		
Liang et al., 2021	E		Competitive pressure	E	T		Competitiveness		
Liang et al., 2021	E		Coercive pressure (customers, official association, partners, government regulations)	E	T		Legitimacy	Regulatory	
Liang et al., 2021	E		Functional Benefits (enhance product-related performance, e.g., lower the cost, enhance productiveness)	T	O		Efficiency		
Liang et al., 2021	E		Symbolic Benefits (competitiveness/competitive extrinsic advantage such as innovation, positive image is the key concept)	T	E	O	Competitiveness	Trust	
Liang et al., 2021	E		Financial Resources (secure)	O	T		Capability	Compatibility	
Liang et al., 2021	E		(Essential) IT Infrastructure (internal)	O	T		Capability	Compatibility	
Liang et al., 2021	E		Top Management (support)	O			Collectivity	Subjectivity	Compatibility
Liu et al., 2021	B		Scalability (BMSCS)	T	E		Scalability		
Liu et al., 2021	B		Transaction uncertainty (through the network)	T	E		Uncertainty		
Liu et al., 2021	B		High sustainability costs	T	E	O	Sustainability	Feasibility	
Liu et al., 2021	B		Loss of keys	T	E	O	Privacy		
Liu et al., 2021	B		Form a sustainable business model	O	E	T	Sustainability		
Liu et al., 2021	B		Occasional errors	T			Reliability		
Liu et al., 2021	B		Conflicts of interest	E			Collectivity		
Liu et al., 2021	B		Corruption	E	O	T	Sustainability		
Liu et al., 2021	B		Malicious attacks	T	E		Security		
Liu et al., 2021	B		A lack of regulatory standards	E			Regulatory		
Liu et al., 2021	B		Insufficient regulatory technology	E			Regulatory		
Liu et al., 2021	B		A lack of regulatory experience (government and market supervision)	E			Regulatory		
Liu et al., 2021	B		Attack due to the open-source code	T			Security		
Liu et al., 2021	B		Problems in the design of smart contracts	T			Maturity		
Mangla et al., 2022	B		Lack of technological development (T1) (in the development stage)	T			Maturity		
Mangla et al., 2022	B		Limited information about infrastructure (T2)	T	E	O	Accessibility		
Mangla et al., 2022	B		Lack of privacy risk (T3) (challenge)	T	O		Privacy		
Mangla et al., 2022	B		Scalability (T4)	T	E		Scalability		
Mangla et al., 2022	B		Forking (T5)	T			Reliability		
Mangla et al., 2022	B		Difficulties in payment channel challenges (T6)	T	E		Accessibility	Complexity	
Mangla et al., 2022	B		Information sharing obstacles (O1)	E			Collectivity		
Mangla et al., 2022	B		Lack of tea SCM policies (O)	E			Policy		
Mangla et al., 2022	B		Lack of governmental commitment (O3)	E			Policy		
Mangla et al., 2022	B		Lack of industry involvement (O4) (the reluctance of stakeholders)	E			Collectivity	Popularity	
Mangla et al., 2022	B		High operational cost (E1)	E	O		Feasibility		
Mangla et al., 2022	B		High investment cost (E2)	T	O		Feasibility		
Mangla et al., 2022	B		Lack of financial subvention (E3) (from governments)	E			Policy		
Mangla et al., 2022	B		High delay cost in transmission (E4)	E	O		Efficiency		
Mangla et al., 2022	B		Lack of research and development units (S1)	E	T		Maturity		
Mangla et al., 2022	B		Nature of tea SC difficulties (S2)	E			Collectivity		
Mangla et al., 2022	B		Unregistered producers (S3)	E			Collectivity		
Mangla et al., 2022	B		Uneducated/unskilled producers (S4)	E	T		Compatibility	Capability	Complexity
Mangla et al., 2022	B		Lack of technological adaptation (S5)	T	O	E	Compatibility		
Mangla et al., 2022	B		Limitation of new rules acceptance (S6) (industry-level and users)	E			Popularity		
Mathivathanan et al., 2021	B		Business owner's unwillingness	O			Subjectivity		
Mathivathanan et al., 2021	B		Unfamiliarity with technology	O	T		Capability	Compatibility	Complexity
Mathivathanan et al., 2021	B		Data privacy/security concerns	T	E	O	Privacy	Security	
Mathivathanan et al., 2021	B		Regulatory uncertainty	E			Uncertainty	Regulatory	
Mathivathanan et al., 2021	B		Technological infeasibility	T	O		Feasibility		
Mathivathanan et al., 2021	B		Complexity in set up/use	T	O		Complexity		
Mathivathanan et al., 2021	B		Uncertain benefits	T	E		Uncertainty		
Mathivathanan et al., 2021	B		Dependence on blockchain operators	T	O		Feasibility		
Mathivathanan et al., 2021	B		Lack of cooperation among supply chain partners	E			Collectivity		
Naef et al., 2022	E		Network governance: Organisational effort: collaboratively building blockchain applications	E	T	O	Collectivity	Capability	
Naef et al., 2022	B		The scope of the network of adopters/network governance/network effects	E			Popularity		
Naef et al., 2022	B		Interoperability concern	E	E	O	Interoperability		
Narwane et al., 2021	E		Supply chain visibility risks (track from the manufacturer to the end customer)	T	E	O	Traceability	Transparency	Novelty
Narwane et al., 2021	B		Infrastructure and development cost (high, concern)	T	O		Feasibility		
Narwane et al., 2021	E		Environmental and Quality management risks (improve)	T	E	O	Sustainability	Adaptability	
Narwane et al., 2021	E		Accidental risks (minimize risk)	E	O		Adaptability	Uncertainty	
Narwane et al., 2021	E		Natural disaster and weather risks	E	O		Adaptability	Uncertainty	
Narwane et al., 2021	E		Disruption risks (risk management)	E	O		Adaptability	Uncertainty	
Narwane et al., 2021	E		Supplier and customer collaboration/integration	E			Collectivity		
Narwane et al., 2021	E		Demand and process-related risks	E	O		Adaptability	Uncertainty	
Narwane et al., 2021	B		Data privacy and security risks (need to ensure uninterrupted access to data)	T	E	O	Privacy	Security	
Narwane et al., 2021	E		Organisational risks (changing market) (minimise the negative impact of uncertainties)	E	O		Adaptability	Uncertainty	
Narwane et al., 2021	E		Demand forecasting and sensing risks (improve resilience)	O			Adaptability	Uncertainty	
Narwane et al., 2021	E		Trust in risk mitigation	E	T	E	Trust	Subjectivity	Adaptability
Narwane et al., 2021	E		Risks in real-time data analysis (detect emerging risk)	E	O		Adaptability	Connectivity	Uncertainty

Narwane et al., 2021	B	Job loss risk (staff resistance)	O			Collectivity		
Narwane et al., 2021	B	Policy and legality related risks	E			Policy	Legality	Uncertainty
Narwane et al., 2021	E	Supply chain resilience	O	E		Adaptability		
Nayal et al., 2021	E	Green and lean practices (GLPR) (sustainable performance) (the need for lean and green technologies ...)	E	O	T	Sustainability	Legitimacy	
Nayal et al., 2021	E	Supply-Chain Integration (SUCI) (information sharing, collaboration, coordination, and strategic alliance)	E			Collectivity		
Nayal et al., 2021	E	Supply-Chain Risk (SUCR) (mitigating risk)	O	E		Adaptability	Uncertainty	
Nayal et al., 2021	E	Internal Environment Conditions (facilitating conditions-resources, expertise, information sharing)	O	T		Capability	Compatibility	Collectivity
Nayal et al., 2021	E	External Environment Conditions (Competitive pressure, social influence of customers, cultures and people)	E			Competitiveness	Popularity	
Nayal et al., 2021	E	Regulatory Support (RESU)	E			Regulatory		
Nayal et al., 2021	A	Performance Expectancy (PERE) (e.g., productivity, risk reduction, overall quality improvement, and speed of tasks)	T	O		Efficiency		
Nayal et al., 2021	A	Top Management Support (TMSU)	O			Collectivity	Subjectivity	Compatibility
Nayal et al., 2021	E	Innovation Capability (INNOC) (firm's capability)	O			Capability		
Nayal et al., 2021	E	Cost (the overall cost of SC from hardware, software, labor, maintenance ... to BLCT adoption cost) (the reduction of overall cost after implementation)	T	O		Feasibility		
Niu et al., 2021	E	Competition among manufacturers	E			Competitiveness		
Niu et al., 2021	E	Demand variance (the level of uncertainty)	E			Uncertainty		
Niu et al., 2021	E	Wholesale/retail price (strategic price)	O	E		Competitiveness		
Niu et al., 2021	E	The incentive to have accurate demand information	O	T	E	Competitiveness		
Orji et al., 2020	E	Availability of specific blockchain tools (TF1) (e.g., smart contract)	T	E		Accessibility		
Orji et al., 2020	E	Infrastructural facility (TF2)	T	E		Accessibility		
Orji et al., 2020	B	Complexity (TF3) (require certain skills to facilitate its adoption)	T	O		Complexity		
Orji et al., 2020	E	Ease of being tried and observed (TF4) (in the freight logistics sector)	T	E	O	Complexity		
Orji et al., 2020	E	Perceived benefits (TF5) (to the logistic industry)	T	E	O	Efficiency		
Orji et al., 2020	E	Compatibility (TF6)	T	O		Compatibility		
Orji et al., 2020	E	Security and privacy (TF7)	T	E	O	Privacy	Security	
Orji et al., 2020	E	Presence of training facilities (OF1)	O	T		Capability	Compatibility	
Orji et al., 2020	E	Top management support (OF2)	O			Collectivity	Subjectivity	Compatibility
Orji et al., 2020	A	Firm size (OF3) (larger size)	O			Capability		
Orji et al., 2020	E	Capability of human resources (OF4)	O			Capability	Compatibility	
Orji et al., 2020	E	Perceived costs of investment (OF5)	T	O		Feasibility		
Orji et al., 2020	A	Organizational culture (OF6)	O			Subjectivity	Compatibility	
Orji et al., 2020	E	Government policy and support (IF1)	E			Policy		
Orji et al., 2020	E	Competitive pressure (IF2)	E			Competitiveness		
Orji et al., 2020	E	Institutional based trust (IF3) (the acceptability of blockchain by the external environment, e.g., customer)	E			Trust	Popularity	Legitimacy
Orji et al., 2020	A	Market turbulence (IF4)	E			Uncertainty		
Orji et al., 2020	E	Stakeholders pressure (IF5)	E			Legitimacy		
Ostern et al., 2021	A	Sentiments toward the technology: negative, positive	O	T		Subjectivity	Trust	
Ostern et al., 2021	A	Assessment of blockchain's business value: future/contingent/current/no value	T	O		Feasibility		
Queiroz et al., 2021	E	Facilitating conditions (resources, knowledge, compatible)	O	T		Capability	Compatibility	
Queiroz et al., 2021	B	Performance expectancy (e.g., productivity)	T	O		Efficiency		
Queiroz et al., 2021	E	Trust	O	T		Trust		
Queiroz et al., 2021	E	Social influence (perceive that important others believe he or she should ...)	E	O		Subjectivity	Legitimacy	Popularity
Queiroz et al., 2021	E	Effort expectancy	T	O		Complexity		
Rana et al., 2022	B	Integration with legacy system (C7)	T	O		Compatibility	Capability	
Rana et al., 2022	B	Reluctance to use blockchain technology (C12)	O			Subjectivity		
Rana et al., 2022	B	Lack of adequate skills (C5)	O	T		Capability	Compatibility	Complexity
Rana et al., 2022	B	Lack of understanding and knowledge (C11)	O	T		Capability	Compatibility	Complexity
Rana et al., 2022	B	Flexibility (C15)	T	O	E	Flexibility	Security	
Rana et al., 2022	B	Regulatory compliance (C4)	E			Regulatory		
Rana et al., 2022	B	Legal issues (C8)	E			Legality		
Rana et al., 2022	B	Ethical issues (C13) (e.g., its effect on the environment/enabling of criminal activity)	E	T		Sustainability		
Rana et al., 2022	B	Scalability (C1)	T			Scalability		
Rana et al., 2022	B	Privacy (C2)	T	E		Privacy		
Rana et al., 2022	B	Security (C3) (endpoint vulnerabilities)	T	E		Security		
Rana et al., 2022	B	Initial cost (C6)	T	O		Feasibility		
Rana et al., 2022	B	Latency cost (C14)	T			Efficiency		
Rana et al., 2022	B	Lack of standards (C9) (and interoperability)	T	E		Interoperability		
Rana et al., 2022	B	Lack of validation (C10)	T	E		Maturity		
Rodríguez-Espindola et al., 2022	E	Regulations	E			Regulatory		
Rodríguez-Espindola et al., 2022	E	Market pressure (stakeholder's expectations, other companies are planning to integrate, the requirement for accuracy ...)	E			Legitimacy		
Rodríguez-Espindola et al., 2022	B	Awareness of the organisational requirements	O	T		Capability	Compatibility	
Rodríguez-Espindola et al., 2022	E	Level of Digital transformation	O	T		Capability	Compatibility	
Rodríguez-Espindola et al., 2022	E	Organisational resilience	O			Capability		
Rodríguez-Espindola et al., 2022	E	Perceived usefulness	T	O		Efficiency		
Rodríguez-Espindola et al., 2022	E	Perceived ease of use	T	O		Complexity		
Saberi et al., 2019	B	Financial constraints	O			Capability	Compatibility	
Saberi et al., 2019	B	Lack of management commitment and support	O			Collectivity	Subjectivity	Compatibility
Saberi et al., 2019	B	Lack of new organizational policies for using blockchain technology	O	T		Compatibility		
Saberi et al., 2019	B	Lack of knowledge and expertise	O	T		Capability	Compatibility	Complexity
Saberi et al., 2019	B	Difficulty in changing organizational culture	O	T		Compatibility		
Saberi et al., 2019	B	Hesitation to convert to new systems	O			Subjectivity		
Saberi et al., 2019	B	Lack of tools for blockchain technology implementation in sustainable supply chains (e.g., new IT tools)	E		O	Accessibility		
Saberi et al., 2019	B	Lack of customers' awareness and tendency about sustainability and blockchain technology	E			Sustainability	Popularity	
Saberi et al., 2019	B	Problems in collaboration, communication and coordination in the supply chain	E			Collectivity		
Saberi et al., 2019	B	Challenge of information disclosure policy between partners in the supply chain	E			Collectivity		
Saberi et al., 2019	B	Challenges in integrating sustainable practices and blockchain technology through SCM	E	T	O	Compatibility	Collectivity	Capability
Saberi et al., 2019	B	Cultural differences of supply chain partners	E			Collectivity	Subjectivity	
Saberi et al., 2019	B	Security challenge	T	E	O	Security		
Saberi et al., 2019	B	Access to technology	T	E	O	Accessibility		
Saberi et al., 2019	B	Hesitation to adopt blockchain technology, due to negative public perception	O	E	T	Subjectivity	Trust	
Saberi et al., 2019	B	Immutability challenge of blockchain technology	T			Flexibility		
Saberi et al., 2019	B	Immaturity of technology	T			Maturity		
Saberi et al., 2019	B	Lack of governmental policies	E			Policy		
Saberi et al., 2019	B	Market competition and uncertainty (demand)	E			Uncertainty	Competitiveness	
Saberi et al., 2019	B	Lack of external stakeholders' involvement	E			Collectivity	Popularity	

Saberi et al., 2019	B	Lack of industry involvement in ethical and safe practices	E			Collectivity	Popularity	Legitimacy
Saberi et al., 2019	B	Lack of rewards and encouragement programs (by government and professional organisations)	E			Policy	Popularity	
Samad et al., 2022	E	Decentralized Database System	T			Novelty	Trust	
Samad et al., 2022	E	Distributed Database System	T			Novelty	Trust	
Samad et al., 2022	E	Cybersecurity (data privacy maintaining of the network participants)	T	E	O	Privacy		
Samad et al., 2022	E	Immutability (tamper-proof)	T	E	O	Security		
Samad et al., 2022	E	Transparency (visibility)	T	E	O	Transparency	Traceability	Trust
Samad et al., 2022	E	Verifiability of transactions (error-free)	T			Reliability		
Samad et al., 2022	E	Enhanced Risk Mitigation	O	E		Adaptability		
Samad et al., 2022	E	Smart Contracts (innovative solutions)	T			Novelty		
Samad et al., 2022	E	Lower Transaction Settlement Time	T	O	E	Efficiency		
Samad et al., 2022	E	Lower transactional costs	T	O	E	Efficiency		
Samad et al., 2022	E	Provenance (trace the origins)	T	E	O	Traceability	Novelty	
Samad et al., 2022	E	Real-time connectivity and information flow (seamless connectivity)	T	E	O	Connectivity		
Samad et al., 2022	E	Traceability (asset)	T	E	O	Traceability	Novelty	
Sharma et al., 2021	E	Reduction in cost (Low Cost)	T	O		Efficiency		
Sharma et al., 2021	E	Traceability	T	E	O	Traceability	Novelty	
Sharma et al., 2021	E	Disintermediation	T			Novelty	Trust	
Sharma et al., 2021	E	Transparency	T	E	O	Transparency		
Sharma et al., 2021	E	Automation	T			Efficiency		
Sharma et al., 2021	E	Security and privacy	T	E	O	Privacy	Security	
Sharma et al., 2021	E	Trust (towards BCT)	O	E	T	Trust		
Sharma et al., 2021	E	Immutability	T			Security		
Sharma et al., 2021	E	Secured Database	T	O	E	Security		
Sharma et al., 2021	E	Decentralized Database	T			Novelty	Trust	
Sharma et al., 2021	E	Risk Management	O	E		Adaptability		
Sharma et al., 2021	E	Distributed Network preventing Single Point of Failure (SPOF)	T			Novelty		
Sharma et al., 2021	E	Cryptographic and Tamper Proof	T			Novelty		
Sharma et al., 2021	E	Improved Resiliency of System	O	E		Adaptability		
Sharma et al., 2021	E	Reducing System Wide Complexity (curtail operational costs)	T	O	E	Efficiency		
Sharma et al., 2021	B	Lack of government Regulation	E			Regulatory		
Sharma et al., 2021	B	Lack of government policy	E			Policy		
Sharma et al., 2021	B	Problems in collaboration, communication, and coordination	E			Collectivity		
Sharma et al., 2021	B	Network (Size and Bandwidth) (e.g., scalability)	T			Scalability		
Sharma et al., 2021	B	Market Uncertainty	E			Uncertainty		
Sharma et al., 2021	B	Resistance to Change	O			Subjectivity	Compatibility	
Sharma et al., 2021	B	Lack of Knowledge and expertise	O	T		Capability	Compatibility	Complexity
Sharma et al., 2021	B	Lack of management commitment and support	O			Collectivity	Subjectivity	Compatibility
Sharma et al., 2021	B	Legal and Contractual Uncertainty	E			Uncertainty	Legality	
Sharma et al., 2021	B	Lack of Awareness about the technology & infrastructure (industry-level)	E	T	O	Accessibility	Popularity	
Sharma et al., 2021	B	Immaturity of Technology/ Unclear Benefits of Technology	T	O	E	Maturity		
Sharma et al., 2021	B	Lack of Access to Technology	T	E	O	Accessibility		
Sharma et al., 2021	B	Lack of Incentives for Adopters	O	T		Feasibility		
Sharma et al., 2021	B	Security, Privacy and Surveillance Issue	T	E	O	Privacy	Security	
Sharma et al., 2021	B	Longer Latency time	T			Scalability		
Sharma et al., 2021	B	Network Effect	E			Popularity		
Sodhi et al., 2022	E	Information aggregation	T			Novelty		
Sodhi et al., 2022	E	Information decentralisation	T			Novelty		
Sodhi et al., 2022	E	Information immutability	T			Security		
Sodhi et al., 2022	E	Information perpetuity	T			Security		
Sodhi et al., 2022	E	Disintermediated and trustless platform	T			Trust	Novelty	
Sodhi et al., 2022	E	Real-time capability	T	E	O	Connectivity		
Sodhi et al., 2022	E	Transparency	T	E	O	Transparency		
Sodhi et al., 2022	E	Cost-effectiveness	T			Efficiency		
Sodhi et al., 2022	E	Agility	T			Efficiency		
Sodhi et al., 2022	E	Traceability	T	E	O	Traceability		
Sodhi et al., 2022	E	End-to-end integration	T	E	O	Connectivity		
Sodhi et al., 2022	E	Efficient decision making	T	O		Efficiency		
Sodhi et al., 2022	E	Stronger risk management	O	E		Adaptability		
Sodhi et al., 2022	E	Customer centricity	T	E	O	Legitimacy		
Sodhi et al., 2022	E	Interoperability	T	E	O	Interoperability		
Sodhi et al., 2022	E	Mass customization (operational efficiency)	T			Efficiency		
Sodhi et al., 2022	B	Technical setup cost	T	O	E	Feasibility		
Sodhi et al., 2022	B	Training cost	T	O	E	Feasibility		
Sodhi et al., 2022	B	Ongoing support cost	T	O	E	Feasibility		
Sodhi et al., 2022	B	Security concerns	T	E	O	Security		
Sodhi et al., 2022	B	Resistance to change	O	E		Subjectivity	Compatibility	
Sodhi et al., 2022	B	Lack of organization-wide coordination	E			Collectivity		
Sodhi et al., 2022	B	Lengthy development time	T	O		Feasibility		
Sodhi et al., 2022	B	Leadership insufficient support and involvement	O			Capability	Subjectivity	Compatibility
Sodhi et al., 2022	B	Lack of workforce skills	O	T		Capability	Compatibility	Complexity
Sodhi et al., 2022	B	Lack of supplier required skills	O			Capability		
Sodhi et al., 2022	B	Unknown risks	E	T	O	Uncertainty		
Sodhi et al., 2022	B	Lack of sense of urgency	O	E	T	Subjectivity		
Sodhi et al., 2022	B	Regulatory risk	E			Uncertainty	Regulatory	
Sodhi et al., 2022	B	Performance measures	T			Maturity		
Sodhi et al., 2022	B	Technology immaturity	T			Maturity		
Sodhi et al., 2022	B	Lack of technology vision in the organization	O	T		Compatibility		
Sodhi et al., 2022	B	Hard to integrate into existing processes and solutions	T	O		Complexity		
Sodhi et al., 2022	B	Benefits being ambiguous	T	O		Maturity		
Sodhi et al., 2022	B	Scalability	T			Scalability		
Sodhi et al., 2022	B	The expectations towards the technology	O		E	Subjectivity		
Sodhi et al., 2022	B	Time and (shared) experience to interact with technology	O	T		Subjectivity	Compatibility	
Sodhi et al., 2022	A	Insignificant Sector	O			Compatibility		

Sodhi et al., 2022	A	Insignificant	Size	O			Capability	
Sodhi et al., 2022	A	Insignificant	Extent of globalisation	E		O	Capability	Compatibility
Sodhi et al., 2022	A	Insignificant	The level of internationalization in the internal supply chain	E		O	Capability	
Song et al., 2022	A	Contingent	The valuation of consumers towards the two seller's products (same but uncertain)	E			Uncertainty	Trust
Song et al., 2022	A	Contingent	Consumer preference	E			Uncertainty	Trust
Song et al., 2022	A	Contingent	Consumers' trust in product information	E			Trust	Legitimacy
Song et al., 2022	A	Contingent	The unit cost of information disclosure	T		O	Feasibility	
Song et al., 2022	A	Contingent	The cost of blockchain applications	T		O	Feasibility	
Song et al., 2022	A	Contingent	The unit sales price of product (strategic price)	O		E	Competitvity	
Song et al., 2022	A	Contingent	The degree of product disclosure	O		E	Competitvity	
Song et al., 2022	A	Contingent	The unit selling cost (production/transportation cost)	O			Capability	
Sternberg et al., 2021	E		Positive awareness of sustainability	T		O	Sustainability	Subjectivity
Sternberg et al., 2021	E		Increased product traceability	T		O	Traceability	Novelty
Sternberg et al., 2021	E		Enhanced trust (based on enhanced transparency)	T		E	Trust	Transparency
Sternberg et al., 2021	E		Need for product traceability (customer demand)	E		O	Traceability	Legitimacy
Sternberg et al., 2021	E		Push for revealing social conditions (Improved competitive position)	E			Legitimacy	Competitvity
Sternberg et al., 2021	E		Need for improving traceability	E			Traceability	Legitimacy
Sternberg et al., 2021	E		Initial investment	T		O	Feasibility	
Sternberg et al., 2021	E		Sufficient financial resources	O			Capability	Compatibility
Sternberg et al., 2021	E		Adequate technical capability	O		T	Capability	Compatibility
Sternberg et al., 2021	E		Data availability	O		T	Capability	Compatibility
Sternberg et al., 2021	B		Decreased operational efficiency	T		O	Efficiency	
Sternberg et al., 2021	B		Incurred nuisance (annoyed by employees)	O		T	Subjectivity	
Sternberg et al., 2021	B		Increased IT handling complexity	T		O	Complexity	
Sternberg et al., 2021	B		Industry stakeholder resistance	E			Collectivity	Popularity
Sternberg et al., 2021	B		External lack of commitment	E			Collectivity	Popularity
Sternberg et al., 2021	B		Rival business relations	E			Competitvity	Legitimacy
Sternberg et al., 2021	B		Necessary IT training investments	O		T	Capability	Compatibility
Sternberg et al., 2021	B		Needed infrastructure	T		E	Accessibility	
Sternberg et al., 2021	B		Increasing coordination demand	E		O	Collectivity	
Sternberg et al., 2021	B		Required openness (from the primary members e.g., data sharing)	E			Collectivity	
Sternberg et al., 2021	A	Indeterminate	Traceability-efficiency	T		E	Traceability	Efficiency
Sternberg et al., 2021	A	Indeterminate	Visibility-privacy	T		E	Privacy	Traceability
Sternberg et al., 2021	A	Indeterminate	Trust-investment (paradox: long-term trust between partners)	E		O	Trust	Feasibility
Sternberg et al., 2021	A	Indeterminate	Performance-commitment (establish capabilities)	E		O	Collectivity	Subjectivity
Toufaily et al., 2021	B		Immature technology	T			Maturity	Feasibility
Toufaily et al., 2021	B		Security	T		E	Security	
Toufaily et al., 2021	B		Data privacy	T		E	Privacy	
Toufaily et al., 2021	B		Cost of technology	T		O	Feasibility	
Toufaily et al., 2021	B		Scalability and performance	T		E	Scalability	
Toufaily et al., 2021	B		Interoperability (between blockchain frameworks, networks, platforms, and legacy systems)	T		E	Interoperability	
Toufaily et al., 2021	B		Complexity	T		O	Complexity	
Toufaily et al., 2021	B		Relation to cryptocurrencies/tokens (reward system, incentive people)	T		O	Feasibility	
Toufaily et al., 2021	B		Regulatory uncertainty	E			Uncertainty	Regulatory
Toufaily et al., 2021	B		Network effects and inter-organisational connectedness	E			Popularity	Collectivity
Toufaily et al., 2021	B		Ecosystem readiness (lack of awareness, education and understanding about the benefits and applicability of blockchain among the ecosystem stakeholders)	E			Popularity	Legitimacy
Toufaily et al., 2021	B		Governance and leadership readiness	O			Capability	Compatibility
Toufaily et al., 2021	B		Business model alignment	O			Capability	Compatibility
Toufaily et al., 2021	B		Organisational readiness	O		T	Capability	Compatibility
Turhan & Akman 2021	E		Facilitating conditions (e.g., resource and knowledge availability)	O		T	Capability	Compatibility
Turhan & Akman 2021	E		Management support	O			Collectivity	Subjectivity
Turhan & Akman 2021	E		Organizational work climate (effective, supportive)	O			Compatibility	Subjectivity
Turhan & Akman 2021	E		Perceived ease of use	T		O	Complexity	
Turhan & Akman 2021	E		Perceived usefulness	T		O	Efficiency	
Turhan & Akman 2021	E		Competitive pressure	E			Competitvity	
Turhan & Akman 2021	A	Contingent	Sector: public-private	O			Compatibility	
Vafadarnikjoo et al., 2021	B		Transaction-level uncertainties (application)	T		O	Uncertainty	
Vafadarnikjoo et al., 2021	B		Usage in the underground economy (reputation)	T		O	Trust	Legality
Vafadarnikjoo et al., 2021	B		Scalability	T			Scalability	
Vafadarnikjoo et al., 2021	B		Privacy risks	T		E	Privacy	
Vafadarnikjoo et al., 2021	B		Managerial commitment	O			Collectivity	Subjectivity
van Hoek 2019	E		Internal interest	O			Subjectivity	Compatibility
van Hoek 2019	E		Executive engagement	O			Collectivity	Compatibility
van Hoek 2019	E		Engagement of 2-4 partners	E		O	Collectivity	Compatibility
van Hoek 2019	B		Lack of understanding	O		T	Capability	Complexity
van Hoek 2019	B		Lack of business case to benchmark	E			Popularity	
van Hoek 2019	B		Security (data integrity concern)	T		E	Security	
van Hoek 2019	B		Need for more comprehensive economic consideration	T		O	Feasibility	
van Hoek 2020a	E		Achieving greater transparency and visibility	T		E	Transparency	Traceability
van Hoek 2020a	E		Improving processes	T		O	Efficiency	Competitvity
van Hoek 2020a	E		Reducing costs	T		O	Efficiency	
van Hoek 2020a	B		A lack of understanding of costs and benefits of blockchain	O		T	Capability	
van Hoek 2020a	B		Concern about the feasibility of the technology	T		O	Feasibility	Subjectivity
van Hoek 2020b	A	Contingent	Contribution to high level supply chain objectives	T		O	Compatibility	
van Hoek 2020b	A	Contingent	Engagement with the technology	O		T	Capability	
van Hoek 2020b	A	Contingent	Technological novelty seeking	T		O	Novelty	
van Hoek 2020b	A	Contingent	Awareness of local context (fit)	O		T	Compatibility	
van Hoek 2020b	A	Contingent	Cognizance of alternative technologies	T		O	Subjectivity	Feasibility
van Hoek 2020b	A	Contingent	Anticipation of technology alteration	O		T	Subjectivity	
Vu et al., 2021	E		Enhance food traceability	T			Traceability	Novelty
Vu et al., 2021	E		Enhance food chain transparency	T		E	Transparency	
Vu et al., 2021	E		Increase efficiency	T		E	Efficiency	
Vu et al., 2021	E		Combat food fraud	T		E	Security	
Vu et al., 2021	E		Reduce cost	T		O	Efficiency	

Vu et al., 2021	E		Pressure from consumers	E				Legitimacy				
Vu et al., 2021	E		Pressure from buyers/suppliers and competitors	E				Legitimacy	Compettivity			
Vu et al., 2021	E		Pressure from regulations	E				Regulatory				
Vu et al., 2021	B		High implementation cost	T		O		Feasibility				
Vu et al., 2021	B		Lack of knowledge and expertise	O		T		Capability	Compatibility	Complexity		
Vu et al., 2021	B		Transparency versus privacy dilemma	O		T	E	Privacy	Transparency	Feasibility		
Vu et al., 2021	B		Blockchain suitability	O		T		Compatibility				
Vu et al., 2021	B		Supply chain readiness	E		T		Collectivity	Popularity			
Vu et al., 2021	B		Inaccurate inputs (oracle problem)	T		E		Reliability				
Vu et al., 2021	B		Variations in standards (different policy/information system)	E		T		Interoperability	Maturity			
Vu et al., 2021	B		Scalability (FSC network)	T		E		Scalability				
Vu et al., 2021	B		Smart contract designing (designing smart contracts for complex business logic remains a great challenge)	T		O		Maturity				
Vu et al., 2021	B		Laws and regulations (different restrictions in different countries)	E				Legality	Regulatory			
Wamba & Queiroz 2022	E		Perceived benefits	T		O		Efficiency				
Wamba & Queiroz 2022	E		Top management support	O				Collectivity	Subjectivity	Compatibility		
Wamba & Queiroz 2022	E		Technology competence	O		T		Capability				
Wamba & Queiroz 2022	E		Absorptive capacity (organisations' ability to obtain internal and external information)	O		E	T	Capability	Compatibility			
Wamba & Queiroz 2022	E		Blockchain trust	O		E	T	Trust	Popularity			
Wamba et al., 2020	E		Knowledge sharing (the exchange of knowledge between firms)	E				Collectivity				
Wamba et al., 2020	E		Trading partner pressure (/readiness)	E				Legitimacy	Popularity			
Wang et al., 2019a	E		Trust: reliability and security of information (reliable and trusted information)	O		E	T	Trust	Security	Reliability		
Wang et al., 2019a	E		Supply chain disconnections and complexities	E		T	O	Connectivity				
Wang et al., 2019a	E		Product safety, authenticity and legitimacy from consumers	E				Legitimacy				
Wang et al., 2019a	E		Public safety and anti-corruption (security and transparency)	T		E	O	Sustainability	Security	Transparency		
Wang et al., 2019a	B		Resistance from current economic winners	E				Collectivity				
Wang et al., 2019a	B		Unwillingness to share valued information among the supply chain actors	E				Collectivity				
Wang et al., 2019a	B		Technical complexity	T		O	E	Complexity				
Wang et al., 2019a	B		Privacy concerns	T		E	O	Privacy				
Wang et al., 2019a	B		Hacking possibilities	T				Security				
Wang et al., 2019a	B		Latency	T				Scalability				
Wang et al., 2019a	B		The cost of implementing or participating in a blockchain system	T		O		Feasibility				
Wang et al., 2019a	B		Cultural resistance	O				Compatibility	Subjectivity			
Wang et al., 2019a	B		Existing business processes	O		T		Compatibility				
Wang et al., 2019b	B		Confidence and related necessity issues (not sure)	O		T		Trust	Subjectivity	Feasibility		
Wang et al., 2019b	B		Cultural, procedural, governance and collaboration issues	E		O	T	Compatibility	Subjectivity	Capability	Collectivity	
Wang et al., 2019b	B		Data input (reliable) and information-sharing issues	T		E		Reliability	Collectivity			
Wang et al., 2019b	B		Technological and network interoperability issues	T		E		Interoperability				
Wang et al., 2019b	B		Cost, privacy, legal and security issues	T		E	O	Privacy	Feasibility	Legality	Security	
Wang et al., 2021	A	Contingent	Blockchain cost (unit information cost)	T		O		Feasibility				
Wang et al., 2021	A	Contingent	The amount of information disclosure by the platform (to customers) (organisational policy)	O		E		Competitivity				
Wang et al., 2021	A	Contingent	The degree of consumer belief in the disclosed information (the extent of trust)	E				Trust	Legitimacy			
Wang et al., 2021	A	Contingent	The price of products (strategic price)	O		E		Competitivity				
Wang et al., 2021	A	Contingent	Competition (strategic interdependence)	E				Competitivity				
Wong et al., 2020	A	Insignificant	Performance Expectancy (more efficiently and effectively)	T		O		Efficiency				
Wong et al., 2020	A	Insignificant	Effort Expectancy	T		O		Complexity				
Wong et al., 2020	E		Facilitating Conditions	O		T		Capability	Compatibility			
Wong et al., 2020	E		Technology Readiness (the right infrastructure)	T		E	O	Accessibility				
Wong et al., 2020	A	Insignificant	Trust	O		E	T	Trust				
Wong et al., 2020	E		Technology Affinity (individual's propensity for active engagement or avoidance with technology, e.g., optimistic)	O		T		Subjectivity				
Wong et al., 2020	E		Regulatory Support: moderator for facilitating condition and technology readiness	E				Regulatory				
Wong et al., 2021	B		Functional Risk Barrier (user's understanding or perception of challenges and risks associated with the use of the BT)	O		T	E	Uncertainty	Subjectivity			
Wong et al., 2021	B		Information Barrier (the understanding of technology)	O		T		Capability	Compatibility			
Wong et al., 2021	B		Usage Barrier (perceive to add value)	T		O		Efficiency	Subjectivity			
Wong et al., 2021	B		Security and Privacy Barrier	T		E	O	Privacy	Security			
Wong et al., 2021	B		Compatibility and Interoperability Barrier	T		E	O	Interoperability				
Wong et al., 2021	B		Systems Quality Barrier (easy to use and useful)	T		O	E	Complexity				
Wu et al., 2021	A	Contingent	The traceability information level based on blockchain technology	T		E	O	Traceability				
Wu et al., 2021	A	Contingent	Supplier's wholesale price/3PL's logistics service price/fresh product e-tailer's retail price	O		E	O	Competitivity				
Wu et al., 2021	A	Contingent	The perceived value of consumers	E				Uncertainty				
Wu et al., 2021	A	Contingent	The consumers' acceptance degree for the product with/without blockchain technology	E				Popularity	Legitimacy			
Wu et al., 2021	A	Contingent	The consumers' preference for traceability information	E				Traceability	Legitimacy			
Wu et al., 2021	A	Contingent	The fresh product supplier's production cost per unit product/The 3PL's logistics service cost per unit product	O				Capability				
Wu et al., 2021	A	Contingent	The product selling period	O				Compatibility				
Wu et al., 2021	A	Contingent	The deterioration rate of the fresh product	O				Compatibility				
Wu et al., 2021	A	Contingent	The allocation proportion of traceability cost of FPSC members when adopting blockchain technology	E		T		Collectivity				
Xu et al., 2022	B		Technical maturity	T				Maturity				
Xu et al., 2022	B		Digital systems integration	T		E	O	Collectivity				
Xu et al., 2022	B		Technology security	T		E	O	Security				
Xu et al., 2022	B		Standardization (data structure and information flow among members)	E				Collectivity				
Xu et al., 2022	B		Bootstrapping problem (to be a follower, not a first mover)	E		O		Competitivity				
Xu et al., 2022	B		Inter-industry cooperation	E				Collectivity				
Xu et al., 2022	B		Stakeholder recognition (supply chain partners)	E		O		Subjectivity	Collectivity	Legitimacy		
Xu et al., 2022	B		Governance conditions (law and regulations)	E				Legality	Regulatory			
Xu et al., 2022	B		Investment environment (uncertainty)	E				Uncertainty				
Xu et al., 2022	B		Legal framework	E				Legality				
Yadav et al., 2021	E		Traceability	T		E	O	Traceability	Novelty			
Yadav et al., 2021	E		Smart contract	T				Novelty				
Yadav et al., 2021	E		Trust in agri-business (outcome) (developed trust by BT)	T		E		Trust				
Yadav et al., 2021	E		Ethical sharing platform amongst agro-stakeholder (fair trade, resource optimization)	T		E		Sustainability				
Yadav et al., 2021	E		BT Certifications of agro-products and process	T		E	O	Security				
Yadav et al., 2021	E		Real-time information availability to agro-stakeholder (better decision making)	T		E	O	Connectivity				
Yadav et al., 2021	E		Monitoring of agro-practices and process	T		E	O	Traceability	Connectivity	Novelty		
Yadav et al., 2021	E		Secured and efficient transactions	T		E	O	Efficiency	Security			
Yadav et al., 2021	E		Provenance of agro-products (trace)	T		E	O	Traceability	Novelty			

Yadav et al., 2021	E		Decentralized and immutable database	T				Novelty	Trust	
Yadav et al., 2021	E		Privacy (using cryptography for maintaining privacy)	T	E		O	Privacy		
Yadav et al., 2021	E		Crowdfunding platform (for sustainable initiatives)	T	E		O	Sustainability		
Yadav et al., 2021	E		Settlement Platform for agro-activities (promote sustainable practice)	T	E		O	Sustainability		
Yadav et al., 2021	E		Governance platform (governance purpose; fair distribution promotion)	T	E		O	Sustainability		
Yang 2019	E		Digitalizing and easing paperwork	T	O			Efficiency		
Yang 2019	E		Tracking and tracing	T	E		O	Traceability	Transparency	Novelty
Yang 2019	E		Customs clearance and management (improved efficiency)	T	E		O	Efficiency		
Yang 2019	E		Standardization and platform development (technical standards for blockchain)	T	E			Interoperability		
Yang 2019	A	Insignificant	Future improvements in a business model	O	T			Capability	Compatibility	
Yang 2019	A	Insignificant	Future improvements in effective regulations	E				Regulatory		
Yousefi & Tosarkani 2022	E		Auditability	T	E		O	Efficiency		
Yousefi & Tosarkani 2022	E		Immutability and encryption	T	E		O	Privacy		
Yousefi & Tosarkani 2022	E		Improved risk management	O	E			Adaptability	Compettivity	
Yousefi & Tosarkani 2022	E		Reduced transaction costs	T	O			Efficiency		
Yousefi & Tosarkani 2022	E		Security	T	E		O	Security		
Yousefi & Tosarkani 2022	E		Shared database (free of human bias and error; shares the information flow real time)	T				Reliability	Connectivity	
Yousefi & Tosarkani 2022	E		Transparency	T	E		O	Transparency		
Yousefi & Tosarkani 2022	E		Flexibility (boosted efficiency by smart contract)	T	O			Efficiency		
Yousefi & Tosarkani 2022	E		Integrity (integrated and transparent platform based on the distributed database with other providers and suppliers)	T	E		O	Connectivity	Transparency	
Yousefi & Tosarkani 2022	E		Improved inventory management	T	E		O	Efficiency		
Yousefi & Tosarkani 2022	E		Customer centricity (enhanced highest trust level)	T	E			Trust		
Yousefi & Tosarkani 2022	E		Anonymity and privacy	T	E			Privacy		
Yousefi & Tosarkani 2022	E		Decentralization	T				Novelty	Trust	
Yousefi & Tosarkani 2022	E		Proving provenance	T	E		O	Traceability	Trust	Novelty
Yousefi & Tosarkani 2022	E		Reduced administrative procedures and settlement lead times	T	O			Efficiency		
Yousefi & Tosarkani 2022	E		Smart Contracts	T				Novelty		
Yousefi & Tosarkani 2022	E		Traceability	T	E		O	Traceability	Novelty	
Yousefi & Tosarkani 2022	E		Social responsibility	T	E			Sustainability		
Yousefi & Tosarkani 2022	E		Environmental sustainability	T	E			Sustainability		
Yousefi & Tosarkani 2022	E		(help organisations') Compliance with government policy/criteria (simplify the complexities)	T	E		O	Efficiency		
Zhang et al., 2022	A	Contingent	Consumer privacy concerns (cost)	E	T			Privacy	Legitimacy	
Zhang et al., 2022	A	Contingent	Information transparency promotion (customer)	E				Transparency	Legitimacy	
Zhang et al., 2022	A	Contingent	Consumes' valuation of products	E				Uncertainty		
Zhang et al., 2022	A	Contingent	The competition between a existing retailer and a new entrant	E				Competitvity		
Zhang et al., 2022	A	Contingent	Selling price (strategic price)	O	E			Competitvity		
Zhao et al., 2019	B		Storage capacity and scalability	T				Scalability		
Zhao et al., 2019	B		Privacy leakage	T	E		O	Privacy		
Zhao et al., 2019	B		High cost problem (a lot of time and money)	T	O			Feasibility		
Zhao et al., 2019	B		Regulation problem - lack of law	E				Legality		
Zhao et al., 2019	B		Regulation problem - lack of regulation	E				Regulatory		
Zhao et al., 2019	B		Throughput and latency issue	T				Scalability		
Zhao et al., 2019	B		Lack of skills	O	T			Capability	Compatibility	Complexity