Table S1. Reviewed literature on challenges of blockchain adoption.

Author(s)	Objective and solution approach	Main theoretical approach	Key discovery	Area of application
Bag et al. (2021)	This study explores 15 barriers to blockchain adoption in Green Supply Chain Management, prioritized using the Fuzzy-Decision-Making Trial and Evaluation Laboratory approach. Data from three Small to Medium Enterprises help analyze these barriers.	Literature review, fuzzy DEMATEL	The "lack of management support" and "difficulty in changing organizational culture" are the most influencing barriers, whereas; "lack of collaboration and network establishment", "lack of technology expertise and skills", and "lack of employee acceptance" are the most influential barriers in the adoption of blockchain in GSCM	Green supply chain management in small and medium enterprises
Bai, Liu, and Yeo (2022)	This study's objective is to explore the difficulties and barriers surrounding the integration of blockchain technology into Supply Chain Finance. An exploratory case study was undertaken involving a Chinese state-owned enterprise. The study developed an initial conceptual framework through semi-structured interviews with employees, top management, and technical specialists from the case firm.	Semi-structured interview, case study, conceptual framework	"Lack of interoperability", "lack of regulatory framework", "lack of technology expertise and skills", "lack of collaboration and network establishment", "high costs of blockchain adoption", and "lack of maintenance and management"	Supply chain finance in China
Balci, and Balci (2021)	This study explored barriers to adopting blockchain in international container trade and identified influential stakeholders. The analysis revealed major barriers like inadequate stakeholder support, limited blockchain understanding, and regulatory gaps. Key influential stakeholders include container lines, ports, beneficial cargo owners, freight forwarders/third-party logistics, and customs authorities.	Literature review, semi.structured interviews, ISM, theory of stakeholder identification salience	"Lack of governmental support and regulations", "lack of market acceptance", "lack of data privacy", "lack of technology expertise and skills", "lack of management support", "reluctance to change business processes", "lack of resource", and "lack of validation" are considered to be the main barriers regarding the supply chain in the maritime industry	Supply chain in the maritime industry
Banerjee, and Chandani (2022)	To hierarchically organize blockchain adoption issues and classify challenges for improved addressing, ISM and MICMAC analysis were conducted. These challenges were categorized into four classes: autonomous, dependent, linkage, and independent.	ISM, MICMAC	"Lack of security", "lack of data privacy", "lack of technology expertise and skills", "lack of a resources", "lack of interoperability", and "high costs of blockchain adoption"	Financial sector
Benabdella et al. (2022)	This study explores the impact of blockchain technology on Industry 4.0 and circular economies, with a focus on viable circular digital supply chains . It identifies, ranks, and analyzes key barriers to blockchain technology adoption in viable circular digital supply chains, addressing gaps in knowledge.	Literature review, analytical hierarchy process, DEMATEL	"Lack of data privacy", "high costs of blockchain adoption", "lack of homogenity and standardization", "lack of market acceptance", "lack of interoperability", and "lack of technology expertise and skills"	Viable circular digital supply chain
Biswas, and Gupta (2019)	Within this study, a framework was contructed to explore hindrances to the adoption and effective integration of blockchains in various sectors and services, employing the DEMATEL technique.	Literature review, experts' opinions review, DEMATEL	"Lack of scalability", "lack of data privacy", "lack of security", "lack of regulatory framework", "lack of immutability", and "unclear environmental benefits"	Operations and supply chain

Caldarelli, Zardini, and Rossignoli (2021)	This paper explores barriers to widespread blockchain adoption and introduces sustainability in the fashion supply chain. It's an exploratory study within a Veneto-based fashion company. Data from interviews and focus groups are analyzed using AQUAD software and structured according to a modified TOE framework.	TOE framework, AQUAD	Barrieres are divided into four areas: technological, organizational, environmental internal and environmental external	Sustainable supply chain of fashion industry in Italy
Chen et al. (2021)	This paper investigates blockchain technology adoption in food supply chains using thematic analysis. Data is collected through desktop research from sources like news articles and research papers. Qualitative thematic analysis identifies key themes, including adoption processes, benefits, and challenges.	Literature review	Challenges are divided into four main groups: "complexity of integration", "immature application of blockchain technology", "blockchain technology characteristics", "high investment in blockchain-based systems", and "absence of regulations, legislation and global standards"	Food supply chain
Chen et al. (2023)	A novel large-scale collective opinion generation approach is proposed based on probability distribution function aggregation that can be combined with context-specific expert classification and criterion weight assignment techniques to generate powerful large-scale group decision making prototypes for assessment and evaluation problems in decision analysis.	LSDGM	"Lack of security", "lack of maturity", "lack of regulatory framework", "lack of governmental support and regulations", and "lack of market acceptance"	Medical supply chain for small and medium enterprises
Dhingra et al. (2024)	This paper examines barriers to blockchain adoption in India's healthcare. Through research and expert input, we've identified 18 challenges, using a two-phase approach: First, the Best Worst Method (BWM) prioritized challenges, followed by sensitivity analysis. Then, Interpretive Structural Modeling (ISM) classified the remaining 15 challenges using Cross-Impact Matrix Multiplication Applied to Classification (MICMAC).	BWM, ISM-MICMAC	"Lack of technology expertise and skills", "high costs of blockchain adoption", "lack of governmental support and regulations", "lack of management support", and "lack of employee acceptance" are the main barriers discovered in this paper.	Indian health-care sector
Dwivedi et al. (2022)	This study explores challenges in applying blockchain technology to manufacturing, specifically in Production and Resource Scheduling (PRS). It identifies readiness challenges from literature and expert insights and prioritizes them using the Fuzzy DEMATEL method. The Maximum Mean De-Entropy (MMDE) algorithm sets a prioritization threshold based on information entropy among these challenges, addressing uncertainty and data limitations using fuzzy set theory.	Fuzzy DEMATEL, Maximum Mean De-Entropy, literature review, expert interviews	"High costs of blockchain adoption", "lack of governmental support and regulations", and "lack of security"	Manufacturing industry

Erol et al. (2022)	This study has a threefold aim: to identify blockchain challenges through literature review and expert insights, analyze them using the proposed method of ISM-MICMAC based on expert evaluations, and connect these challenges to the diffusion of innovation theory.	ISM, MICMAC	The most significant obstacles for blockchain in the tourism industry are the "absence of technical maturity" and "lack of interoperability."	Tourism industry
Fernando, Rozuar, and Mergeresa (2021)	This paper investigated the factors influencing the adoption of blockchain technology and its impact on carbon performance, employing the theory of technology-organization-environment (TOE) as the foundational framework for developing an adoption model.	TOE framework	The main barrieres are "lack of management support" and "lack of technology expertise and skills"	Manufacturing industry in Malaysia
Gaur (2019)	This paper explores how IBM blockchain can benefit enterprises by enhancing processes and efficiency, resulting in cost savings. It adopts a detailed approach to a specific use case, transforming business operations into a blockchain framework, considering both business and technology aspects.	Case study	"Lack of security", "lack of interoperability", "high costs of blockchain adoption", and "uncertain ROI"	IT industry blockchain of IBM
Ghode et al. (2021)	This research aims to offer an insight into the use of blockchain technology in supply chains and model the hurdles in adopting blockchain technology within supply chain. To model the adoption challenges of blockchain technology in supply chain, Interpretive Structural Modeling is employed. The challenges are initially identified through a literature review and then confirmed through expert opinions.	Literature review, ISM	Key challenges are "lack of collaboration and network establishment", "lack of maturity", "degree of immutability", and "lack of security", and "lack of data privacy"	Supply chain
Govindan et al. (2021)	This paper ranks blockchain-based healthcare platform barriers using a unique structural approach from a balanced scorecard perspective. It considers component strength and influence intensity, differentiating it from models like DEMATEL. This is applied to assess adoption barriers in Iran's healthcare sector.	Expert interviews, DEMATEL	"High costs of blockchain adoption", "lack of maturity", "lack of governmental support and regulations", "lack of data privacy", lack of technology expertise and skills", "lack of resource", "lack of management support", "lack of security", "lack of interoperability", "degree of immutability", "lack of scalability", "lack of market acceptance", "lack of collaboration and network establishment", "lack of homogenity and standardization", and "lack of employee acceptance"	Healthcare industry in Iran
Hamann-Lohmer, and Lasch (2020)	This article's empirical research utilizes expert interviews to analyze blockchain adoption potential and barriers in Operations Management and manufacturing. Industry experts provide insights into effective strategies for promoting adoption and suggest research directions for scholars.	Semi-structured interview	"Lack of governmental support and regulations", "lack of standardization and homogenity", "high costs of blockchain adoption", "lack of employee acceptance", and "lack of technology expertise and skills"	Operations management and manufacturing industry

Han, and Rani (2022)	This study introduces an innovative model that combines CoCoSo and CRITIC methods to evaluate barriers to blockchain adoption in supply chain management in manufacturing. We apply this model to a case study in a manufacturing environment, conduct sensitivity analysis, and demonstrate its superiority over the PF-WASPAS method.	Pythagorean fuzzy-CRITIC-CoCoSo	"Reluctance to change business processes", "lack of maturity", "lack of data privacy", "high costs of blockchain adoption", "lack of security", "lack of market acceptance", "lack of regualatory framework", "uncertain ROI", " lack of awareness", "unclear responsibilities", and "lack of technology expertise and skills"	Sustainable supply chain management in the manufacturing sector
Hunt, Narayanan, and Zhuang (2021)	To explore blockchain's use in Humanitarian Operations Management we systematically review current literature and practices. Our assessment is categorized into four areas: blockchain's overview in HOM, identity management, humanitarian logistics, and communication.	Literature review	"Lack of regulatory framework", "lack of data privacy", "high costs of blockchain adoption", "lack of technology expertise and skills", "uncertain ROI", and "uncertain responsibilities", "	Humanitarian operations management
Kaur et al. (2022)	This study investigates the key barriers to blockchain adoption in supply chain finance among Indian SMEs. It employs methods such as the fuzzy-analytic hierarchy process, sensitivity analysis, and fuzzy-decision-making trial and evaluation laboratory to identify, prioritize, and analyze the cause-and-effect relationships of these barriers.	Fuzzy AHP, Fuzzy-DEMATEL, Sensitivity analysis	Barriers are divided into main barriers: "technology barriers", "organisatons barriers", "security barriers", "knowledge barriers", "external barriers", and "financial barriers"	Small and medium enterprises in India
Komulainen, and Nätti (2023)	This research examines these barriers from both organizational and business network perspectives through qualitative interviews with financial service sector experts, particularly those affiliated with the securities services value network.	Literature review, experts' opinions review	The identified barriers are divided into four categories: internal psychological, internal functional, external psychological, and external functional dimensions.	Securities services value network
Kosmarski (2020)	This paper examines the adoption of blockchain-based solutions in academia from 2017 to 2020. It conducts a critical review of projects, relevant literature, and qualitative research involving interviews and focus groups with various stakeholders. The study identifies key challenges and barriers to blockchain adoption in the academic context.	Literature review, Semi-structured interviews	The main barrieres are "lack of maturity", "lack of regulatory framework", "lack of governmental support and regulations", "lack of security", and "lack of market accpetance", "uncertain ROI", and "unclear responsibilities"	Academia sector in the European Union, Russia, Belarus and the United States of America
Kouhizadeh, Saberi, and Sarkis (2021)	In this study, blockchain adoption barriers using the technology-organization-environment framework and force field theories were investigated. A comprehensive overview of these barriers for sustainable supply chain management by combining insights from technology, organizational practices, and sustainability literature was offered and through a multi-faceted approach, including academic and industry expert inputs, these barriers using the DEMATEL were analyzed.	Framework/ literature review, experts' opinions review, DEMATEL	The key obstacles to enhancing supply chain sustainability primarily involve technological and external factors	Sustainable supply chain in the USA

Kumar et al. (2023)	The review surveys existing literature on blockchain-based financing for SMEs, outlining trends, opportunities, and challenges. It presents a framework for understanding this research and suggests future directions. Covering 53 articles, it evaluates diverse aspects such as peer-to-peer lending, supply chain finance, decentralized lending, and asset tokenization.	Literature review	The factors given the highest priority are "lack of governmental support and regulations", "lack of scalability", "lack of technology expertise and skills", and "lack of security"	Small and medium enterprise
Lu (2022)	This chapter uncovers barriers to blockchain adoption in life sciences organizations and offers strategies for facilitation. It highlights issues like negative perceptions, complexity, institutionalization, and a lack of ecosystem thinking. Strategies include evaluating blockchain use cases, aligning with the innovation culture, non-disruptive implementation, and timely action as the innovation culture grows.	Literature review	"Lack of market acceptance", "lack of regulatory framework", and "lack of collaboration and network establishment" are evaluated as the main challenges	Life science organizations
Mahjoub, Hassoun, and Trentesaux (2022)	This article offers insights into and examines the prospects and obstacles linked to the integration of Blockchain technology in small and medium-sized enterprises (SMEs). Additionally, we showcase existing projects, initiatives, and blockchain platforms designed for SMEs. Lastly, we highlight unresolved research topics and delineate potential paths for future research.	Literature review	"Lack of maturity", "lack of scalability", "lack of latency", "lack of market acceptance", "lack of resource", "lack of interoperability", "lack of governmental support and regulations", " lack of regulatory framework", "lack of technology expertise and skills", "lack of data privacy", "degree of immutability", and "high costs of blockchain adoption" are the main challenges for SMEs	Small and medium enterprise
Makhdoom et al. (2019)	This paper systematically examines the IoT landscape, covering security, performance, and blockchain technology evolution. Gaps were found by comparing blockchain benefits with IoT requirements. Practical challenges in integrating IoT devices with blockchain were also discovered. Solutions for addressing key obstacles to blockchain's adoption in IoT are proposed.	Literature review	"Lack of scalability", "lack of regulatory framework", "lack of security", "lack of maintenance and management", "lack of validation", "lack of interoperability", and "lack of data privacy"	Internet of Things
Mathivathanana et al. (2021)	Using Total Interpretive Structural Modelling (TISM) and Cross-Impact Matrix Multiplication Applied to Classification (MICMAC), this study identifies adoption barriers, explores their interrelationships, and categorizes them by strength and dependence. Blockchain's potential in revolutionizing supply chains is examined.	Total Interpretive Structural Modelling (TISM), Cross-Impact Matrix Multiplication Applied to Classification (MICMAC)	"Lack of technology expertise and skills", "lack of security", "lack of data privacy", "lack of regualtory framework", "lack of maturity", "difficulty in changing organizational culture", "reluctance to change business processes", "uncertain ROI", "lack of governmental support and regulations"and "lack of collaboration and network establishment"	Supply chain

Mohammad, and Vargas (2023)	This study aimed to bridge the knowledge gap by investigating barriers to blockchain adoption. Surveying 289 academic and IT professionals in Saudi higher education, the study confirmed the negative effects of privacy and security concerns, the perception of blockchain being finance-centric, and language issues on adoption.	Semi-structured in-depth expert interviews, TOE framework	Division of 15 identified barriers into technological, organizational, and environmental categories	Higher educationi nstitutions in Saudia Arabia
Moretto, and Macchion (2022)	This examination focuses on identifying factors, both facilitating and hindering, in implementing blockchain technology across extended supply chains. Assuming blockchain adoption at the supply chain level, we interviewed five blockchain providers and seven fashion industry companies to gain diverse perspectives on this topic.	Case study	"High costs of blockchain adoption", "lack of market acceptance", and "lack of homogenity and standardization	Supply chain in the fashion industry
Mukherjee et al. (2023)	This research investigates the obstacles electronic MSMEs encounter in adopting blockchain-based circular economies for environmental sustainability.	ICM, MICMAC, fuzzy TOPSIS	"Lack of collaboration and network establishment", "lack of market acceptance", and "lack of data privacy" are considered as main barriers	Indian electronic MSMEs
Naef, Wagner, and Saur (2021)	A multiple case study approach is used to compare five currently active collaborative blockchain applications.	Semi-structured interviews	"Lack of collaboration and network establishment", "lack of validation", and "lack of interoperability" are considered as main barriers	Supply chain
Nguyen, Shu-Ling Chen, and Du (2023)	This study highlighted variations in CSSPs' views on blockchain adoption barriers and their adoption approaches. It outlined the intricate implementation challenges of current blockchain applications in container shipping, including barriers and their connections. Industry experts provided recommendations for navigating this complexity to achieve successful blockchain adoption.	Literature review, experts' opinions review	"Lack of resources", "lack of governmental support and regulations", "lack of technology expertise and skills", "lack of collaboration and network establishment", "lack of data privacy", " lack of regulatory framework", "lack of interoperability", and "lack of market acceptance", and "lack of maturity"	Supply chain in the maritime industry
Okorie et al. (2022)	This paper aims to explore the obstacles to integrating Blockchain Technology (BCT) in Circular Food Supply Chains (CFSCs) to enhance operational efficiency for firms. This exploration will be carried out through a multi-methodological approach.	Literature review, fuzzy Delphi	Barrieres are divided into six main categories: security and laws, funding, technical, functional, organizational, and business environment	Circular food supply chain
Ostern, Holotiuk, and Moormann (2021)	This research uses a sensemaking lens to explore how organizations approach blockchain. It examines the influence of perceived business value and sentiments on blockchain prototype development. With a critical realist perspective, it analyzes different adoption strategies, categorizing them into four types, and provides recommendations for including the pre-adoption phase in academic analysis.	Literature review, experts' opinions review	"Lack of interoperability", "lack of regulatory framework", "lack of management support", "high costs of blockchain adoption", "lack of data privacy", "lack of security", "lack of standardization and homogeneity", and "lack of maturity"	Financial sector

Panghal et al. (2022)	This paper conducts empirical research to investigate the factors influencing the adoption of blockchain technology in the food processing industry's reverse logistics. Exploratory factor analysis is employed to identify and characterize the factors that are considered challenges in implementing blockchain for reverse logistics.	Exploratory factor analysis	"Lack of resources", "lack of collaboration and network establishment", "lack of security", "lack of homogenity and standardization", and "high costs of blockchain adoption"	Food processing industry
Patil et al. (2021)	This study identifies and models blockchain implementation barriers in the context of HSC. We've identified 14 potential barriers through literature review and expert consultations, categorizing them into four perspectives and prioritizing them using the fuzzy best-worst method.	Literature review, experts' opinions review	"Lack of data privacy", "lack of security", "lack of technology expertise and skills", and "high costs of blockchain adoption"	
Queiroz and Wamba (2019)	This study examined individual-level blockchain adoption behavior in the supply chain sectors of India and the USA. Drawing on emerging literature in blockchain, supply chain, and technology acceptance models, a modified version of the Unified Theory of Acceptance and Use of Technology (UTAUT) was developed and estimated it using Partial Least Squares Structural Equation Modeling (PLS-SEM).	Literature review, experts' opinions review, DEMATEL	"Lack of market acceptance", "lack of employee acceptance"	Supply chain sector of India and USA
Queiroz et al. (2020)	This study examines the adoption of blockchain technology and barriers in the Brazilian operations and supply chain context. A model was developed based on Unified Theory of Acceptance and Use of Technology, supply chain literature, and emerging blockchain technology literature, which we validated with Brazilian operations and supply chain professionals using PLS-SEM.	Unified Theory of Acceptance and Use of Technology, partial Least Squares Structural Equation Modeling	"High costs of blockchain adoption", "lack of market acceptance", and "lack of employee acceptance"	Brazilian operations and supply chain
Rana, Dwivedi, and Hughes (2022)	This study explores interrelated challenges in a vital field. We analyzed 16 challenge sets from existing literature and collected data from nine blockchain experts across sectors. Using ISM and MICMAC, we pinpointed key challenges for our framework.	ISM, MICMAC	"Lack of interoperability", "lack of technology expertise and skills", "degree of immutabiity", "lack of scalability", "lack of data privacy", "lack of security", "high costs of blockchain adoption" ,"costs of latency", "lack of validation", and "lack of homogenity and standardization"	Indian Public Sector
Rijanto (2021)	This paper investigates how blockchain adoption can improve business financing in agriculture by connecting banking and insurance to real-time data. It uses a case study approach with the TOE framework and "mindfulness of adoption" theory to explore this evolving industry.	TOE framework, case study	The main challenges in context of the case study are "lack of market acceptance", and "lack of collaboration and network establishment"	Agricultural industry

Saberi et al. (2018)	The focus of this thorough assessment is centered on how blockchains, a potentially transformative technology still in its early stages, can surmount various potential obstacles. We outline four categories of barriers to adopting blockchain technology: inter-organizational, intra-organizational, technical, and external hurdles.	Literature review	The barriers are divided into four categories: inter-organisational, intra-organisational, technical, and external	Sustainable supply chain
Saheb, and Mamaghani (2021)	This study uses a mixed-method qualitative analysis to expand the literature on IT business value by identifying the organizational benefits and challenges of blockchain adoption in the banking industry.	Semi-structured interviews, Delphi, literature review	"Lack of governmental support and regulations", "lack of market acceptance", "lack of management support", and "lack of technology expertise and skills"	Banking industry
Sahebi, Masoomi, and Ghorbani (2020)	This study uses inductive methods to identify advantages tied to barriers in adopting blockchain in humanitarian supply chains. The fuzzy Delphi method screens these barriers, and the Best-Worst Method (BWM) ranks them. English-language journal searches were conducted to fill research gaps. FDM selects barriers, and based on expert input and FDM results, the final blockchain adoption barriers for humanitarian supply chains are determined. BWM calculates and ranks the chosen barriers' weights.	Fuzzy Delphi, Best-Worst method	"Lack of technology expertise and skills", "high costs of blockchain adoption", "the lack of validation", "lack of interoperability" and "lack of scalability" are the moste important barriers	Humanitarian supply chains
Sahoo, and Thakur (2023)	This study identifies and analyzes factors impeding blockchain adoption in SCF. It uses a hybrid approach combining fuzzy DELPHI-AHP-DEMATEL to validate and assess these factors. Fuzzy Delphi techniques validate the factors, followed by AHP prioritization, and DEMATEL classification into cause-and-effect groups.	Hybrid fuzzy DELPHI-AHP-DEMATEL	The factors given the highest priority are "lack of technology expertise and skills", and "high costs of blockchain adoption"	Construction industry
Sanka et al. (2021)	This paper examines the progress, applications, and challenges of blockchain technology. While many papers emphasize cryptocurrencies, IoT, and security, this article offers a broader overview of recent developments and adoption across various domains. It delves into blockchain cryptography, surveys both public and enterprise blockchains quantitatively, and outlines potential research directions for the future.	Quantitative surveys	"Lack of scalability", " lack of security", "lack of data privacy", "lack of maturity", "lack of governmental support and regulations", "lack of technology expertise and skills", and "reluctance to change business processes", "lack of interoperability"	Cross industry
Sharma et al. (2023)	This study pinpoints critical challenges in the adoption of blockchain technology for public service delivery within Indian state governments. It does so by conducting a literature review and engaging stakeholders in focus group discussions, followed by ranking these challenges based on stakeholder opinions using conjoint analysis.	TOE framework, Delphi, Fuzzy Logarithmic Additive Weights Methodology	"Reluctance to change business processes", "costs of latency", "lack of scalability", "lack of security", "lack of resource", "lack of technology expertise and skills", "lack of management support", "lack of regualtory framework", and "lack of governmental support and regulations" are considered the most significant barriers	Public sector

Sharma, and Joshi (2021)	This paper seeks to pinpoint barriers to the adoption of blockchain technology in the Indian healthcare industry and explores the notable issues associated with blockchain applications in the healthcare sector.	TISM-FUZZY-MICMAC	The results indicate that the lowest awareness concerning legal issues and insufficient support from top management exert the most significant driving influence.	Indian health care industry
Singh et al. (2022)	This study systematically reviews 122 peer-reviewed papers published between 2012 and 2022 to assess the role of blockchain in developing secure and resilient supply chains. It applies the Theory, Methodology and Context framework to suggest future research directions.	Literature review	Six prominent are revealed: blockchain's role in enhancing resilience and cybersecurity, its impact on intermediation, disintermediation, and reintermediation, the challenges associated with its adoption, and the advantages it brings to supply chain applications.	Supply chain
Singh et al. (2023)	The aim is to uncover key barriers to adopting blockchain in the Indian agricultural supply chain. Through literature research and expert insights from agro-related domains, including agro-organizations, academia, and stakeholders, these barriers are identified. Using an integrated ISM-DEMATEL approach, we assess their interconnections and strengths. The Fuzzy-MICMAC technique categorizes these barriers, and a sensitivity analysis validates our model's reliability.	ISM-DEMATEL, Fuzzy-MICMAC	"Lack of regulatory framework", "lack of market acceptance", "lack of maturity", "lack of security", "lack of management support", and "lack of awareness" are the main barrieres	Agriculture supply chain in India
Singh et al. (2023)	This study identifies the major obstacles to adopting blockchain technology in India's sustainable construction sector. It analyzed data through a two-stage PLS-SEM-ANN approach, involving 722 construction stakeholder surveys. The final model of barriers to adopting blockchain for sustainable construction was statistically validated.	PLS-SEM-artificial-neural-network	The most substantial barriers include organizational, technological, cultural, legal, security, and government factors.	Sustainability in the construction industry in India
Song, and Zhu (2022)	This paper aims to explore the utilization of blockchain in SMSs, identify challenges encountered by blockchain-enabled SMSs (BSMSs), and present valuable research directions and insights by conducting a comprehensive literature review survey, starting with blockchain concepts and extending to blockchain applications in SMSs across the product life cycle. Key challenges for BSMSs and proposes research directions are discussed and qualitative and quantitative insights into BSMSs, concluding with implications are provided.	Literature review	"High costs of blockchain adoption", "lack of governmental support and regulations", "lack of security", "lack of data privacy", "lack of interoperability", and "lack of regulatory framework"	Smart manufacturing systems
Sunmola, Burgess, Tan (2021)	The objective of this study is to explore the foundational elements of blockchain adoption in the digital transformation of sustainable supply chains. This investigation is carried out through a systematic literature review and case studies, resulting in a three-phase building block model: pre-adoption, adoption, and post-adoption.	Literature review, case studies	"Lack of governmental support and regulations" is considered the most prominent challenge in blockchain adoption	Sustainable supply chain

Tan (2022)	Using bibliometric analysis, this article examines the connection between blockchain and public policy design, identifying key themes and highlighting challenges in adopting blockchain technology in the public sector.	Bibliometric analysis	"Lack of governmental support and regulations", "lack of regualtory framework", "lack of technology expertise and skills", "lack of resources", "difficulty in changing organizational culture", "lack of interoperability", "lack of data privacy", "uncertain ROI", "reluctance to change business processes", "lack of security", and "lack of scalability" are considered to be the main barriers in the public sector	Public sector
Tella, Amuda, and Ajani (2022)	The study's sample comprises ten system librarians from five distinct libraries and ten archivists from five separate archives in the Southwest geopolitical region of Nigeria. The research followed a purely qualitative method, gathering data through open-ended questionnaires sent to participants via mail to ensure compliance with COVID-19 protocols, maintain social distancing, and prevent physical contact.	Open-ended questionnaire	"Lack of maintenance and management", "and high costs of blockchain adoption"	Management of libraries and archives in the 4IR in Nigeria
Toufaily et al. (2021)	The aim of this paper is to explore the obstacles and consequences associated with the adoption of blockchain technology in both private and public sectors, particularly from an entrepreneurial viewpoint. Drawing from 46 semi-structured interviews, the study puts forth a data-derived conceptual framework centered around the environmental, organizational, and technological challenges pertinent to blockchain adoption.	Semi-structured interviews, data-driven conceptual framework	"Lack of scalability", "lack of data privacy", "lack of security", "lack of interoperability", "lack of technology expertise and skills", "high costs of blockchain adoption", "lack of collaboration and network establishment", "lack of regulatory framework", and "lack of information technology infrastructure"	Middle East and North African Region
Upadhyay et al. (2020)	This paper explores the challenges and potentials of adopting blockchain technology within the UK automotive industry context, utilizing the technological-organizational-environmental (TOE) framework for operational excellence. The research methodology involves a systematic review of academic papers from top journals which provided insights into the technological and management aspects of blockchain adoption in the context of operational excellence, as per the TOE framework.	Literature review, TOE framework	"Lack of scalability", " lack of technology expertise and skills", "lack of resources", "lack of information technology infrastructure", "lack of security", "lack of standardization and homogenity", "unclear environmental benefits", "lack of regulatory framework", "costs of latency", "lack of interoperability", "lack of govermental support", "lack of market acceptance", "lack of management and maintenance", "high costs of blockchain adoption", "lack of data privacy", "lack of collaboration and network establishment", and "lack of maturity"	Automotive industry in UK

Vu, Abhijeet, and Bourlakis (2021)	This study conducts a systematic review of 69 articles to uncover Blockchain adoption drivers, barriers, applications, and implementation stages in FSCs. It identifies ongoing Blockchain concerns as potential future research areas and proposes a three-stage conceptual framework for Blockchain implementation in FSCs, aligned with innovation adoption theory.	Literature review, innovation adoption theory	"High costs of blockchain adoption", "lack of technology expertise and skills", "lack of data privacy", "lack of validation", "uncertain ROI", "lack of interoperability", "lack of scalability", "lack of homogenity and standardization", "degree of immutability", and "governmental support and regulations"	Food supply chain
Vu, Abhijeet, and Bourlakis (2021)	This study creates a model for implementing blockchain in the food industry. It integrates established theories, validates them through expert interviews, and develops a practical framework. This model guides stages, tasks, and context for successful blockchain integration, benefiting both academic understanding and practical implementation in the food sector.	Semi-structured interview, framework	"Lack of resources", "uncertain ROI", "lack of interoperability", "high costs of blockchain adoption", "lack of maturity", "lack of market acceptance", "lack of validation", and "lack of governmental support and regulations"	Food supply chain
Waqar et al. (2024)	This study examines the challenges of implementing blockchain in small construction projects in Malaysia, identifying significant barriers across five categories. Through structural equation modeling, a blockchain implementation model is developed for these projects.	Literature review, in-depth interviews	The paper divides the challenges in echnological, work environment, economic and planning, operational, and privacy and regulation	Small construction projects in Malaysia
Wu et al. (2023)	This study reviews blockchain adoption barriers, identifies critical challenges, and provides solutions. It employs the TOE theory and fuzzy DEMATEL method, outlining barriers with the TOE framework and highlighting key obstacles through fuzzy DEMATEL analysis. Recommendations are given for government, industry, and construction organizations to foster blockchain adoption.	TOE framework, fuzzy DEMATEL	The construction industry holds greater importance regarding environmental barriers, which are "lack of security", "lack of interoperability", "lack of maturity", and "lack of governmental support and regulations"	Construction industry
Xu et al. (2022)	Using collective case studies and in-depth interviews, this paper investigates the potential and challenges of blockchain technology in German OEMs. The findings highlight advantages in aggregating product information, securing transactions, and enhancing supply chain reliability.	Case study, in-depth interviews	"Lack of maturity", "lack of regulatory framework", "lack of collaboration and network establishment", and "lack of governmental supoort and regulations"	Supply chain of automotive industry in Germany
Xu, Chong, and Chi (2023)	The primary objective of the research is to offer a thorough comprehension of these hindrances and their interconnected dynamics within the AEC industry's framework. Through an examination of literature, industry reports, and expert input, the study identified barriers hindering blockchain adoption. Subsequently, the authors examined the interrelations among these factors via a two-stage integration of Interpretive Structural Modeling (ISM) and the Decision-Making Trial and Evaluation Laboratory (DEMATEL) method.	ISM, DEMATEL	"Lack of scalability", "lack of security", "lack of data privacy", "lack of interoperability", "lack of homogenity and standardization", "lack of technology expertise and skills", "lack of market acceptance", "lack of collaboration and network establishment", "lack of regulatory framework", "lack of information technology infrastructure", "lack of market acceptance", "high costs of blockchain adoption", and "reluctance to change business processes	Architectural engineering and construction industry

Yadav et al. (2020)	The study´s objective was to uncover key barriers to adopting blockchain in the Indian agricultural supply chain. Through literature research and expert insights from agro-related domains, including agro-organizations, academia, and stakeholders, these barriers were identified. Using an integrated ISM-DEMATEL approach, their interconnections and strengths were assessed . The Fuzzy-MICMAC technique categorized these barriers, and a sensitivity analysis validated our model's reliability.	ISM, DEMATEL, MICMAC	The most significant barriers are "lack of interoperability", "lack of regulatory framework",	Supply chain in the agricultural sector in India
Yadav, Shweta, and Kumar (2023)	This study examines adoption barriers using the TOE framework, based on existing literature and input from administrators, academics, immunization, and blockchain experts. The analysis involves both the Delphi method and fuzzy DEMATEL techniques.	TOE framework, Delphi, fuzzy DEMATEL	The most significant obstacle is the need for alterations in organizational structure and policies	Vaccine supply chain in India
Yang et al. (2020)	This research explores the viability of using public and private blockchain technologies in construction through two industry cases, utilizing Hyperledger Fabric and Ethereum to design distinct architectures for each case, showcasing the process, benefits, and challenges of applying these technologies in the construction domain.	Business process cases	"Lack of scalability", "lack of data privacy", "lack of security", "high costs of blockchain adoption", "lack of collaboration and network establishment", reluctance within the industry to embrace change"	Construction industry
Yontar (2023)	This study applies the TOE framework, categorizing elements from literature and interviews into a decision framework. It identifies key factors for adopting Blockchain Technology in the Logistics Supply Chain.	TOE framework	"Costs of latency", and "high costs of blockchain adoption"	Logistics and supply chain
Yudi, Nor, and Fineke (2021)	In this study, the adoption of blockchain technology and its influence on carbon performance are investigated. The foundation for constructing a technology adoption framework is provided by the theory of technology-organization-environment (TOE).	Theory of technology-organization-environment	"Lack of technology expertise and skills"	Manufacturing industry in Malaysia

| Zhao, and Si (2023) | This paper delves into the current state of Blockchain applications across diverse sectors including insurance, banking, payments, asset trading, loans, remittances, and the Internet of Things (IoT) within the finance industry, as well as financial inclusivity and enterprise-level interactions in finance and governance. We analyze the impediments to widespread adoption of Blockchain, particularly the risks associated with transaction fees overtaking mining rewards. Through a comparative exploration of emerging Blockchain technologies and incentive challenges in practical applications, we aim to offer valuable insights for Blockchain researchers and developers operating within financial service domains. | Literature review | "Lack of security", "lack of data privacy" | Financial services in China's Greater Bay Area |