World Journal of Advanced Research and Reviews
eISSN: 2581-9615 CODEN (USA): WJARAI
Cross Ref DOI: 10.30574/wjarr
Journal homepage: https://wjarr.com/

(REVIEW ARTICLE)

Literature review: Influential factors in blockchain implementation in the apparel and textile industry

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World Journal of Advanced Research and Reviews, 2024, 22(03), 285–291

Publication history: Received on 26 April 2024; revised on 04 June 2024; accepted on 06 June 2024

Article DOI: https://doi.org/10.30574/wjarr.2024.22.3.1697

Abstract

Blockchain is a technology that has changed the paradigm in various fields, as it is able to provide irreversible, network-wide, and securely encrypted proof of transactions. This article highlights the influential factors in the implementation of blockchain technology in the apparel and textile industry, while providing insight into the challenges in adopting this technology. This paper provides a literature review on the potential of blockchain technology in the apparel and textile industry to analyze its role in product traceability, transparency, and authenticity. To achieve this, the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) method helped in the identification, screening and eligibility process of finding relevant articles. The results of the research articles obtained were then analyzed and interpreted which included various authors, objectives, case study countries, data processing methods. The main findings of this study obtained 23 factors that have both positive influence and become obstacles. The conclusion from the interpretation of the results of most of the articles obtained has the aim of exploration of the implementation using data processing methods carried out mostly using descriptive analysis methods. The most countries used as case study locations are China. This research can also be a foundation for further research in analyzing influencing factors in the implementation of blockchain in the apparel and textile industry.

Keywords: Blockchain Technology; PRISMA; Apparel and textile Industry; Literature Review

1 Introduction

Blockchain is a technology that has changed the paradigm in various fields, especially in the financial system and supply chain. With a decentralized and transparent system, blockchain can improve efficiency, security, and accuracy in various business processes [2]. Therefore, it is important to understand more about the concept and potential of blockchain in changing the way various industries work. With blockchain, the process of transactions and data exchange between the parties involved can be done more quickly and safely [3]. With such great potential, it is not surprising that many companies and organizations are starting to adopt blockchain technology to improve their operational efficiency [4]. As such, a deep understanding of blockchain will be key to making the most of this technology's potential.

The apparel and textile industry is one of the most important sectors in the manufacturing world. This industry includes various types of products such as clothing, fabrics, and more. Along with technological developments and evolving consumer demands, the textile industry is constantly striving to improve their production efficiency and product quality. One way to achieve this is by adopting blockchain technology. in their supply chain. By using blockchain, the production and distribution process of textile products can be tracked more transparently and accurately [5][6]. This not only helps improve operational efficiency, but also gives consumers confidence about the origin of the products they buy. Blockchain technology also provides much- needed transparency in the textile and products industry [7][8]. By allowing information about the supply chain and production to be verified in real-time, consumers can be assured that

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the products they purchase are produced in an ethical and compliant manner. In addition, the use of blockchain can also help reduce the problem of counterfeit products that often occur in this industry. Through the implementation of blockchain technology, companies can improve transparency in their supply chains and ensure that their products are produced to ethical standards. This can increase consumer confidence in their products and reduce the risk of counterfeit products hurting their business. Thus, the purpose of this paper is to illustrate how the adoption of blockchain technology can greatly benefit the textile and products industry as a whole.

2 Method

The method performed in this article Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) is a methodological framework used widely in research to ensure transparent and comprehensive reporting of systematic reviews and meta-analyses. PRISMA provides a structured approach to conducting literature reviews, including clear guidelines for search strategies, article selection, data extraction, and synthesis of results [9]. PRISMA aims to improve the quality and reliability of systematic reviews by promoting consistency and transparency in the review process [10]. The use of PRISMA ensures that the review process is rigorous, reproducible, and minimizes bias in article selection and analysis [11]. Figure 1 illustrates the refinement process undertaken to build the research library for this review. In collecting articles using databases found in *Scopus* and *ScienceDirect* using 2 keywords. The first keyword used is "Blockchain in apparel and textile industry" with the limitation of research articles and the range of publication years starting from 2018-2023. The results obtained from the Scopus database are 11 documents. *ScienceDirect* obtained a total of 141 documents. Searching with the keyword "Blockchain in textile industry" obtained 31 article documents on *ScienceDirect* obtained a total of 538 article documents. Of the two keywords, screening of documents that have duplication is carried out so that it is reduced to 380 article documents. In the next stage, select articles that match the research topic. The screening and selection results resulted in 17 appropriate article documents.

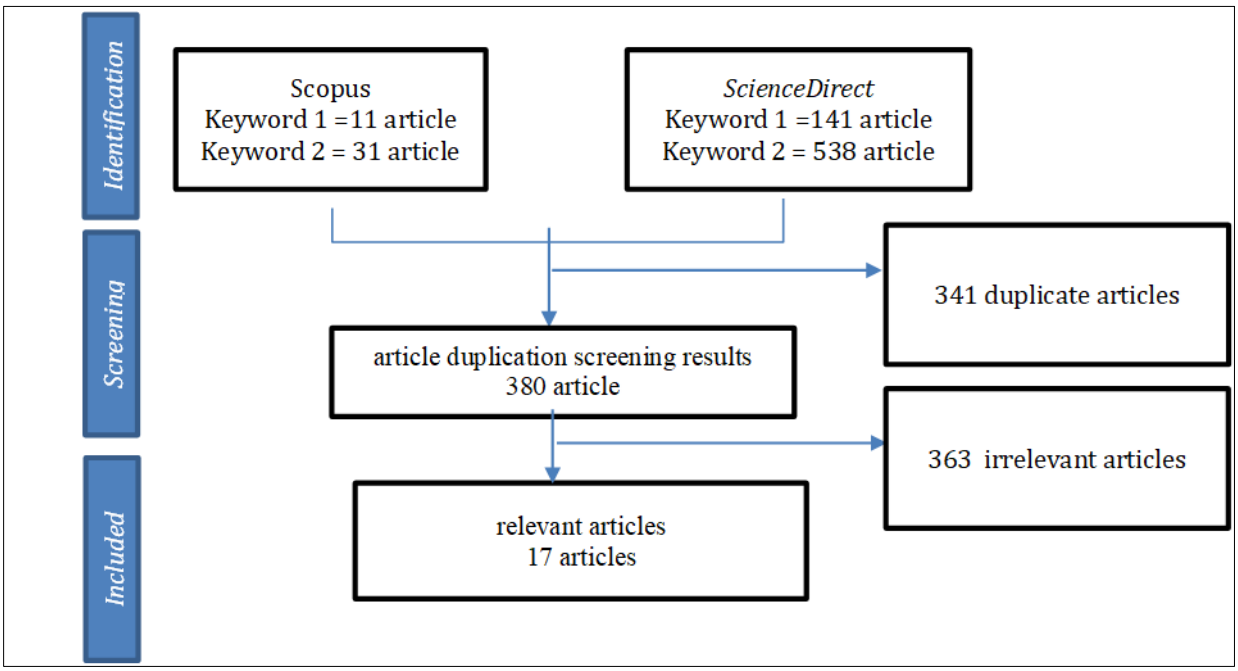

Figure 1 PRISMA Diagram (Preferred Reporting Items for Systematic Review and Meta-Analysis)

3 Results and Discussion

In this section, the results of the article selection process will be explained based on the systematic literature review (SLR) mechanism. The final number of articles selected is 17 articles that are relevant and related to the influential factors in the implementation of blockchain in the apparel and textile industry. The results are shown in table 1.

Table 1 Literature Search Results

No	Authors	Purpose	Case Study Country	Method
1	Liu et al.,(2023)	Knowing the assessment approach of Environmental, Social, and Governance (ESG) indicators in the implementation of Blockchain in the textile and apparel industry	Hongkong	SMAA-2
2	Debnath et al. (2023)	Identifying critical success indicators for blockchain implementation in green supply chain management in the textile and product textile industry di Bangladesh	Bangladesh	Dematel
3	Nath et al. (2022)	Identifying factors that can influence the success of *blockchain* implementation in supply chains of apparel industry	Bangladesh	PLS-SEM
4	Benstead et al., (2022)	An exploration of the practical application of *blockchain* technology in the fashion industry to look at the enabling indicators and its potential to improve transparency and improving supply chain performance *Triple Bottom Line* (TBL).	U.K.	Pattern-Matching Logic
5	Jain et al. (2022).	Conduct exploration indicators that influence the adoption of Blockchain-based E-commerce Platforms (BEEP) in the used clothing industry	India	SEM
6	Moretto et al. (2022)	Identify the factors influencing the use of blockchain technology in the fashion industry supply chain, including the drivers, barriers, and supply chain variables that influence the implementation of this technology.	Italy	Descriptive Analysis
7	Alves et al (2022)	Examine the potential use of blockchain technology and the Internet of Things (IoT) in the implementation of footprint and circular economy in the textile and apparel industry and identify the factors that influence it.	Global	Descriptive Analysis
8	Caldarelli et al. (2021)	Identify and analyze the barriers to blockchain implementation as a solution step for a sustainable fashion industry.	Italy	Coding - In Vivo
9	Agrawal et al. (2021)	To develop a blockchain-based information tracking framework that can increase transparency and visibility in the supply chain of the textile and apparel industry, and ensure product authenticity.	Global	Descriptive Analysis
10	Ahmed et al. (2021)	Identify indicators that influence the implementation of blockchain in discussing opportunities and challenges in achieving a start-to-finish supply chain footprint in the apparel industry.	U.K.	Evaluation Multi-criteria
11	Bullón Pérez et al. (2020)	Examine transparency, authenticity, and reliability in the apparel supply chain and to illustrate applicability.	Spain	Descriptive Analysis
12	Wang et al. (2020)	Exploring the barriers and benefits of implementing blockchain technology in the fast-fashion industry as it affects the sustainable economic cycle.	Global	Descriptive Analysis
13	Guo et al., (2020)	Knowing the application of blockchain technology that affects the disclosure of information related to environmentally friendly supply chain flows in the fashion industry	China	Cost and Revenue Costing

14	Pal et al. (2020)	To analyze the results of implementing blockchain in the textile and apparel manufacturing supply chain using RFID tags and sensor-based data communication networks.	Global	Descriptive Analysis
15	Lam et al. (2019)	Observations on the use of Distributed Ledger Technology (DLT) blockchain in the textile and clothing industry supply chain to improve transparency, security and efficiency.	Hongkong	Descriptive Analysis
16	Choi et al. (2019)	Outline the impact of data quality on social welfare and supply chain profitability in the fashion industry, by exploring the use of blockchain technology.	China, India, South Africa	Newsvendor
17	Fu et al. (2018)	Identify the beneficial factors and shortcomings of a blockchain-powered Emission Trading Scheme (ETS) framework to enhance environmental sustainability in the fashion apparel manufacturing industry.	China	Evaluation Multi-criteria

blockchain in the apparel and textile industry based on the author, purpose, country of study and method used. The results of the literature review analysis are sorted by year of publication. The purpose of each article shows the direction of the research itself, where most of the objectives are to find out the factors that influence both and obstacles in the implementation of blockchain technology in the apparel and textile industry. Some articles including [13][14][16] have the aim of explaining the factors that have an influence on the implementation of blockchain. There are several methods used in the articles obtained including Descriptive Analysis, SEM Method, Newsvendor, Dematel and several other methods. Most of the research methods from the articles obtained mostly use analysis in data processing. In addition, there are several countries that are the place of case studies that have implemented blockchain technology. countries that are the place of case studies include Italy, Hong Kong, Bangladesh, India and China. But China is the country with the number of publications related to research on analyzing factors that influence the implementation of blockchain technology in the apparel and textile industry. From the 17 articles then analyzed and produced a number of factors that have an influence on the implementation of blockchain technology in the apparel and textile industry. The factors obtained from 17 articles are then displayed in table 2.

Table 2 Factor Search Results

No.	**Factor**	**Source**
1	Data Openness	[14],[15], 17], [18], [19],[21],[25],
2	Real-Time Information	[17], [25]
3	Technology Reliability	[7], [14],[16], [17], [18],[19],[20], [21] [22], [24], [27],
4	Data Security	[14],[16], [17],[19],[20], [24], [25],
5	Ease of Information Traceability	[16],[17],[18],[19], [25], [21]
6	Decentralized System	[17], [18], [21]
7	System Sustainable Technology	[14],[17], [25]
8	Cost Efficiency	[12], [15],[16],[17],[27]
9	Investment Minimal Risk	[16],[19]
10	Cost Effectiveness	[12],[17],[19],[20],[25]
11	Management Support	[14],[19], [26] , [21], (2023) [13]
12	Management Commitment	[14], [19]
13	Leadership	[12]
14	Human Resource Capabilities	[7], [13],[19],[22], [26]
15	Plan Long Term	[7],[13],[19]

16	Government Support	[13],[14],[15],[16],[19],[21],[26],[27]
17	Partner Commitment	[12],[[14], [15],[16],[18], [20],[21],[22],[25],[26]
18	Disclosure of Information from Partners	[12],[14],[15],[18],[21],[22],[25]
19	Trust from All Parties	[12],[14],[18],[20],[22],[25]
20	Management Culture	[14], [16], [19]
21	Environmental Sustainability	[7],[13],[15],[17],[21],27
22	Inquiry Consumer	[7],[13].[16],[19],[23]
23	Trial Success	[16],[18]

Table 2 shows 23 factors that influence the implementation of blockchain in the apparel and textile industry. These factors can have a positive effect or become obstacles in the development of blockchain technology itself. There are three most influential factors based on the number of articles that mention that the factor has an influence. Among them are the technology reliability factor with 11 articles, the government support factor with 10 articles, and the partner commitment factor with 10 articles.

4 Conclusion

Based on the results of the literature review conducted on the topic of discussion related to influencing factors in the implementation of blockchain in the apparel and textile industry, it is concluded that the literature review can assist researchers in seeing opportunities for further research in the future. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) method helps in the process of identification, screening and eligibility in finding relevant articles. The final results of the literature review search were obtained as many as 17 articles. In the interpretation of the results, most of the articles obtained have the aim of exploration of the implementation of blockchain in the apparel and textile industry using. There are various data processing methods in the form of Descriptive Analysis, SEM Method, Newsvendor, Dematel and several other methods from the results of the literature review. The most countries used as case study locations are China. then from the results of the literature review obtained 23 factors that influence the implementation of blockchain in the apparel and textile industry. There are three factors that choose influence based on what is written in the article, namely there is a technology reliability factor with 11 articles, a government support factor with 10 articles, and a partner commitment factor with 10 articles.

4.1 Future Research Directions

The results of this literature review study provide a very open opportunity for further research on the topic of influential factors in the implementation of blockchain technology in the apparel and textile industry. Especially in various countries of the apparel industry which is a growing sector and needs to be explored more deeply regarding the implementation of blockchain technology implementation which is a challenge for f u t u r e research and studies. The differences in influential factors in a country will affect the development of blockchain technology itself. Approaches using the latest methods and collaboration can be used in further data collection and processing.

Compliance with ethical standards

Disclosure of conflict of interest

No Conflict of interest to be disclosed.

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