BLOCKCHAIN ADOPTION IN TOURISM: GROUNDED THEORY-BASED CONCEPTUAL MODEL

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Abstract

This study aims to move forward a blockchain tourism research and add understanding regarding blockchain adoption in the tourism industry. Grounded theory method based literature review was applied as a research methodology. Based on the literature review, the authors developed a conceptual model of blockchain adoption in tourism by defining casual, context, intervening conditions that affect blockchain adoption and outlining the consequences of blockchain adoption on the tourism sector. This research will contribute to the blockchain adoption literature as well as will give answers to the industry practitioners on how this innovative technology can be adopted and whether it worth investments or not.

Resumen

Este estudio trata de avanzar la investigación sobre blockchain en turismo, y contribuir a elevar el nivel de conocimiento sobre la adopción de la tecnología blockchain en el sector turístico. Como metodología de investigación se ha aplicado la revisión bibliográfica basada en el método de la teoría fundamentad. Basándose en dicha revisión bibliográfica, se ha desarrollado un modelo conceptual para la adopción de la tecnología blockchain en turismo, definiendo las condiciones intermedias, casuales y contextuales que tienen efecto en la adopción de blockchain y han delimitado las consecuencias de la adopción de blockchain en el sector turístico. Esta investigación contribuirá a la literatura sobre la adopción de blockchain en el turismo y dará respuestas a los profesionales de la industria sobre cómo se puede adoptar esta tecnología innovadora y si vale la pena invertir o no.

Keywords: Blockchain adoption, blockchain, tourism, grounded theory

Palabras clave: Adopción de blockchain, blockchain, turismo, teoría fundamentada

Introduction

The tourism industry is constantly embracing technological innovations for its sustainability and future growth and development. The last innovation the tourism sector puts a great emphasis on is blockchain technology, which can totally revolutionise the industry, affect operational efficiency, and strengthen competitiveness of tourism enterprises (Kizildag et al. 2019) as well as reduce poverty of local communities at disadvantageous tourism destinations (Barreto et al.2019) and increase tourists' experiences. The blockchain market is estimated to be worth approximately USD 2.3 Billion by 2021 (Kastelein, 2016), yet widespread blockchain adoption might take long time because of lack of understanding and expertise about the technology itself (Damani, 2017).

Global tourism and hospitality companies are facing tough digitalisation competition and disruption to their operations that force them to adopt blockchain technology (Magovan, 2017; Treiblmaie & Önder, 2019). Thus, many hospitality and tourism enterprises have started to invest in adoption of blockchain systems (Pilkington et al., 2017). Yet, some companies have proved the immatureness of blockchain technology. For example, FlightChain, decentralised platform that logged more than two million flight changes between Geneva Airport, Heathrow Airport, and Miami International Airport, turned out to be more sophisticated to use in comparison with the cloud-based data services (Magas, 2020). Furthermore, some blockchain-based travel projects failed to materialise, for instance, Beenest, with some cases showing no relationship between decentralised travel solutions and real application of blockchain technology in the tourism sector (Magas, 2020). Nevertheless, the tourism industry has witnessed the successful implementations of blockchain technology by large travel companies. Among the early adopters of blockchain technology that successfully adopted the technology are TUI that uses blockchain technology in its booking, reservation, and payment systems (Marr, 2018), CheapAir, Expedia, and airBaltic that accept payments in bitcoins (Kerr, 2018), and S7 Airlines that deploys blockchain infrastructure for issuing and selling tickets (Magas, 2020).The tourism blockchain solutions are emerging exponentially, yet among the most popular ones are WindingTree, LockTrip, TravelChain, Tripago (Antoniadis et al., 2020; Nam et al., 2019).

Meanwhile, the tourism academic communities also demonstrate a strong interest in developing a deep understanding of blockchain technology and its possible impacts on the travel and tourism industry. Nevertheless, despite several studies on blockchain there is still a lack of

knowledge and understanding around blockchain technology, the factors facilitating its adoption, and real consequences of blockchain adoption for the tourism companies and the whole tourism sector (Kizildag et al., 2019). This sets back not only academic research, but also practical application in the entire tourism sector. Some scholars agree that deeper and rigorous research on the topic, as well as development of solid theoretical frameworks, is in need in order to push blockchain adoption. A careful evaluation of the context, conditions, peculiarities of blockchain technology and the environment that plans to use this technology should be done in order to provide answer on whether to adopt blockchain technology or not (Valeri & Baggio, 2020).

This research was initiated with the objective to move forward a blockchain tourism research. Due to the limited number of studies on the topic, this research intends to shed light on how blockchain technology can be adopted by the tourism businesses and how blockchain adoption will affect the tourism sector. Therefore, the main goal of this research is to propose a conceptual model for blockchain adoption in the tourism industry. In order to achieve the goal, we seek the answers to the following research questions: 1) "What conditions contribute to blockchain adoption?"; 2) "What conditions are needed for blockchain adoption?"; 3) "What interactions can be obtained from blockchain adoption?", and 4) "How blockchain adoption can impact the tourism industry?".

To find answers, we decided to conduct a thorough literature review of previous work related to blockchain technology use and its possible implications for the tourism industry. To specify, a grounded theory methodology is applied in this study. The number of qualitative research in the tourism literature is very limited (Stumpf et al., 2016) despite the benefits of qualitative research on tourism (Cohen, 1998; Jamal & Hollinshead, 2001) and incremented use of grounded theory approach in complex issues. Using grounded theory as an analytic framework can assist in identifying and classifying various topics of interest, theoretical perspectives, and methodologies in the blockchain tourism research. To achieve progress in tourism research, it is crucial to develop modern theoretical insights (Stumpf et al., 2016).

This research attempts to find an answer on a critical question regarding the antecedents and consequences of blockchain adoption in the tourism industry. The study aims to theoretically contribute to blockchain, tourism, and information technology literature by exploring the important factors affecting the blockchain adoption in tourism. In addition, the authors hope to provide practical contributions to the industry professionals on what should be done in order to adopt the blockchain technology. Additionally, based on the results of the research the tourism

marketers and destination managers can decide on whether they should invest in blockchain adoption or not.

The rest of the paper is structured as follows. The next section presents an overview of blockchain technology and reviews the existing literature. Section 3 explains the research methodology and proposes a conceptual model for blockchain adoption in tourism. Finally, the paper discusses implications and concludes.

Literature Review

OVERVIEW OF BLOCKCHAIN

In 2008 there was released a paper named "Bitcoin: A Peer-To-Peer Electronic Cash System" written by Satoshi Nakamoto. In this paper there were proposed that online payments could take place between two parties directly without going through a financial institution (Nakamoto, 2008). The well-known cryptocurrency Bitcoin is the first successful realisation of this concept. After bitcoin's success, a crypto market has been expanding exponentially with newly emerging cryptocurrencies. However, underlying blockchain technology is finding new range of applications beyond finance (Crosby et al., 2016). Different sectors and industries including health, governance, and tourism show a huge interest in the adoption and implementation of this innovative technology.

The aim of blockchain technology is to develop a decentralised environment with no third party that controls the transactions and data (Yli-Huumo et al., 2016). Blockchain is a distributed database of records or public ledger of all transactions that have been realised (Crosby et al., 2016). The information about each transaction is shared among all participants, called nodes; this attribute ensures system's transparency (Yli-Huumo et al., 2016). Every transaction in the public ledger is confirmed by agreement of most of the nodes in the system, and once entered, the information cannot be easily deleted or modified (Crosby et al., 2016). One of the key leading features of blockchain technology lies in its ability to trace transactions within the decentralised databases and thus excluding counterfeiting and fraud (Kostakis & Giotitsas, 2014). Other two important features of blockchain technology are distributed consensus and anonymity (Crosby et al., 2016). All nodes in blockchain system are anonymous, that makes it more secure for other nodes to confirm the transactions (Yli-Huumo et al., 2016). Blockchain is able to support trustworthy transactions via networked computation instead of human monitor and control (Zhao et al., 2016). Meanwhile, blockchain itself can be conceptualised as meta-technology since it presents the integration of other technologies as software development, cryptography, database technology, etc. (Mougayar, 2016).

There are three generations of blockchain technology's development: the first one is the development of Bitcoin, the second generation is smart contracts, and the third one is decentralised applications (DApps), which allow interaction with blockchain technologies on smartphones or browsers (Nam et al., 2019). There is a big number of DApps in the tourism market; using smart contracts and cryptocurrencies, they can facilitate the creation of new business models that will benefit both citizens and travellers.

Despite strengths and benefits of blockchain technology as disintermediation, security, automation, immutability, trust, costs, and traceability (Boucher et al., 2017; Seffinga et al., 2017), there are challenges to overcome regarding the possibility of hacking (Zheng et al., 2018), high operating costs and energy consumption (Deloitte, 2016), difficulty to understand the technology (Ksehtri, 2017a). Overall, blockchain technology is viewed to have a possibility to revolutionise the global domain of both financial transactions and information exchange by making them more transparent, flexible, and secure (Filimonau & Naumova, 2020). Also, blockchain technology can disrupt many industries, eliminate the need for a trustworthy intermediary, and reduce operational costs. Regarding the downsides, there is a hope that they will be overcome in the future due to the continuous technological and conceptual development of blockchain technology (Filimonau & Naumova, 2020).

BLOCKCHAIN IN TOURISM

Tourism industry can benefit from blockchain technology, however, research on the topic is very scarce. Table 1 summarises the main research focuses addressed in the existing studies within a blockchain tourism research domain.

Research focus	Reference
Bitcoin use	Leung&Dickinger, 2017
Impacts of blockchain	Barreto et al., 2019; Di Vaio&Varriale, 2020; Dogru et al., 2018; Calavresi et al., 2019; Korze, 2019; Nam et al., 2019; Pilkington, 2017; Rejeb at al., 2019; Tham&Sigala, 2020; Treiblmaier&Önder, 2019; Varelas et al., 2019; Ying et al., 2018
Loyalty program	Udegbe, 2017
Blockchain applications	Antoniadis et al., 2020; Ozdemir et al., 2019; Zeren&Demirel, 2020
Blockchain adoption	Bolici et al., 2019; Nurryev et al., 2020; Valeri, 2020; Valeri&Baggio, 2020
Blockchain implementation	Filimonau&Naumova, 2020; Flecha-Barrio et al., 2020; Kizildag et al., 2019

Disintermediation	Rashideh, 2020

Table 1. Previous literature within blockchain tourism research. Source: Own elaboration

Current literature mainly focuses on the impacts of blockchain on the tourism industry and the implementation of blockchain technology in the tourism and hospitality sectors. The studies have discussed the potential of the technology to optimise the business distribution channels (Calvaresi et a., 2019; Önder & Treiblmaier, 2018) and contribute to the tourism development in the small island economies (Kwok & Koh, 2018). A theory-based understanding of possible impacts of blockchain technology on the tourism industry has been also provided. Thus, based on transaction cost theory, Treiblmaie r& Önder (2019) reveal that blockchain technology will at the same time yield cost reduction in some areas and increases in others that will lead to the adaption of organisational and market structures. From the perspective of the resource-based view, blockchain technology is able to impact inter- and intra-organisational functions and management structures that could finally affect an organisation's competitiveness (Treiblmaier & Önder, 2019). Several studies have addressed the impacts of blockchain technology on medical tourism (Rejeb et al., 2019), smart tourism (Korze, 2019; Nam et al., 2019), and sustainable tourism goals (Tham & Sigala, 2020).The recent studies have examined the scope of potential integration of blockchain technology into the hospitality operations (Filimonau & Naumova, 2020) and have empirically confirmed the low level of blockchain implementation in the hospitality management (Flecha-Barrio et al., 2020). From a view of the diffusion of innovation theory, hospitality and tourism companies are likely to be slow in implementation and adoption of blockchain technology unless "co-creation and sharing platforms business culture with various stakeholders become more and more integral part "of their core operations (Kizildag et al., 2019, p.966).

Due to the possibility of blockchain applications to enhance tourism in different fields (Dogru et al., 2018), some studies have provided a review of the existing DApps and blockchain-based projects in the tourism industry(Antoniadis et al., 2020; Zeren & Demirel, 2020) as well as have proposed a measurement tool for assessing and comparing different applications (Ozdemir et al., 2019).

Empirical research has explored the cryptocurrency adoption from the perspective of both travellers and tourism enterprises. Regarding travellers' perceptions towards cryptocurrency use, it was found that travellers didn't tend to use bitcoins for online travel product shopping (Leung & Dickinger, 2017). In terms of intention to adopt cryptocurrency payments by the small and

mid-sized tourism enterprises, it was revealed that effect of social influence, company's strategic orientation, and individual characteristics of a manager had a significant effect on the intention to adopt cryptocurrency payments (Nyrryev et al., 2020).

Some studies have empirically confirmed the role of blockchain technology in enhancing a customer loyalty program (Udegbe, 2017), whereas other studies have provided a theoretical framework for the role of blockchain technology in increasing the level of disintermediation in the tourism industry (Rashideh, 2020). Based on the major postulations of agency theory, Kizildag et al. (2019) argue that blockchain technology can facilitate trustworthy business relations between different stakeholders in digital platforms.

Despite different focuses addressed by the studies, the scholarly research on blockchain in tourism is limited in scope and extent (Treiblmaier, 2020). From review of existing literature, it is evident that most studies bear exploratory nature and focus on generically characteristics and possible implications of blockchain technology on the tourism sector. A lack of empirical research is also obvious.

Furthermore, despite its importance, the phenomenon of blockchain adoption receives little attention among the tourism scholars with only few works discussing the possible effects of blockchain adoption in the tourism and hospitality industries (Valeri & Baggio, 2020).

Methodology

This research aims at developing a conceptual model of blockchain technology adoption in the tourism sector. Applying the grounded theory method, this study performed a systematic literature review to explore the different aspects of blockchain technology and revealed the main factors affecting blockchain adoption in tourism. A systematic literature review is acknowledged to be a comprehensive method for identifying, synthesising, and evaluating the existing studies on a particular topic (Fink, 2005). The scholars proposed different procedures for the review process (Bandara et al., 2015; Sylvester et al., 2013), yet the most important condition is to find the most appropriate research tool, which helps obtain a comprehensive summary of the literature (Confente, 2015). Recent tourism scholars applied a systematic review to investigate topics such as sustainable smart tourism destinations (Shafiee et al., 2019), virtual reality and augmented reality in tourism (Yung&Khoo-Lattimore, 2019), trust in tourism via blockchain technology (Calvaresi et al., 2019).

This research employed the grounded theory method for conducting a systematic review. Grounded theory is a qualitative research design, which enables to investigate a certain phenomenon through an inductive process that usually produces a theoretical understanding of that phenomenon (Strauss & Corbin, 1990). The method is useful for conducting a comprehensive and theoretical analysis on a specific topic (Wolfswinkel et al., 2013). The grounded theory aims at explaining the phenomenon based on the concepts, categories and propositions, and the correlations between them (Strauss & Corbin, 1990). In this type of research design, a data analysis consists of three main steps: first, open coding that identifies categories, propositions, and dimensions; second, axial coding that examines strategies, conditions, and consequences; and third, selective coding that builds a theory.

Some researchers agree that an effective review produces a solid foundation for the progress of knowledge (Webster & Watson, 2002). Grounded theory was found to be useful not only for describing raw data or theory testing, but also for developing a theory-based or concept-centric framework (Wolfswinkel et al., 2013). Besides, grounded theory lets the researchers build a new theory where the research is limited or new insight is required (Matteucci & Gnoth, 2017).

When conducting a systematic literature review, this study followed a five-step process introduced by Wolfswinkel et al. (2013) (see Fig 1).

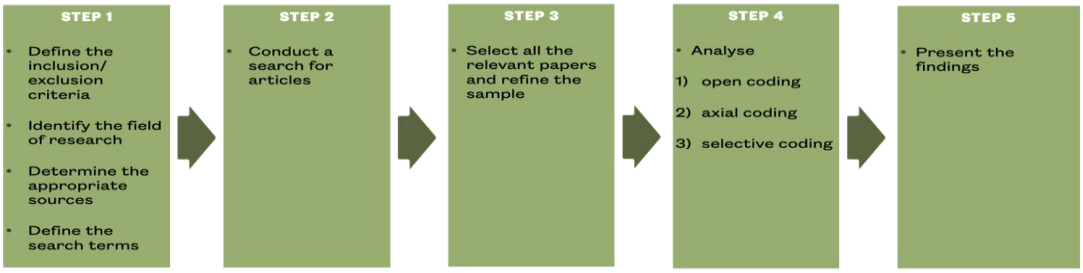

Fig 1. A five-step grounded theory method for literature review. Source: Wolfswinkel et al. (2013)

STEP 1

First of all, the authors defined the criteria for which papers should be included and which papers should be excluded from the analysis. The authors agreed on the following inclusion criteria: 1) papers written in English; 2) papers published from 2017 to 2020 (there were not papers published on the topic prior 2017); 3) papers within a blockchain tourism research domain and with a close semantic relationship with tourism; 4) academic journal papers, conference proceedings, and book sections; 5) full-text papers. Second, the authors identified the fields of research. Due to the limited research on blockchain adoption in the tourism

industry, the papers with focus on blockchain technology in general as well as on blockchain adoption and implementation in tourism, hospitality, airline, food, and service industries were included in the further analysis. Third, Google Scholar database was chosen for selection of the relevant articles. Lastly, the search terms were defined. The following search terms were used to find the relevant articles: blockchain in tourism/hospitality/airline/food/service industry, blockchain adoption in tourism/hospitality/airline/food/service industry. The search was conducted applying the keywords existing in the title, abstract, or body of the papers.

STEP 2

In the second step, a search of articles was conducted. The initial search yielded 55 publications.

STEP 3

In the third step, the titles, abstracts, and keywords were reviewed to select the relevant papers. The irrelevant papers were excluded based on the inclusion/exclusion criteria. After reading full body articles, a final sample of 34 papers was selected for further analysis. The search and selection process is depicted in Fig 2.

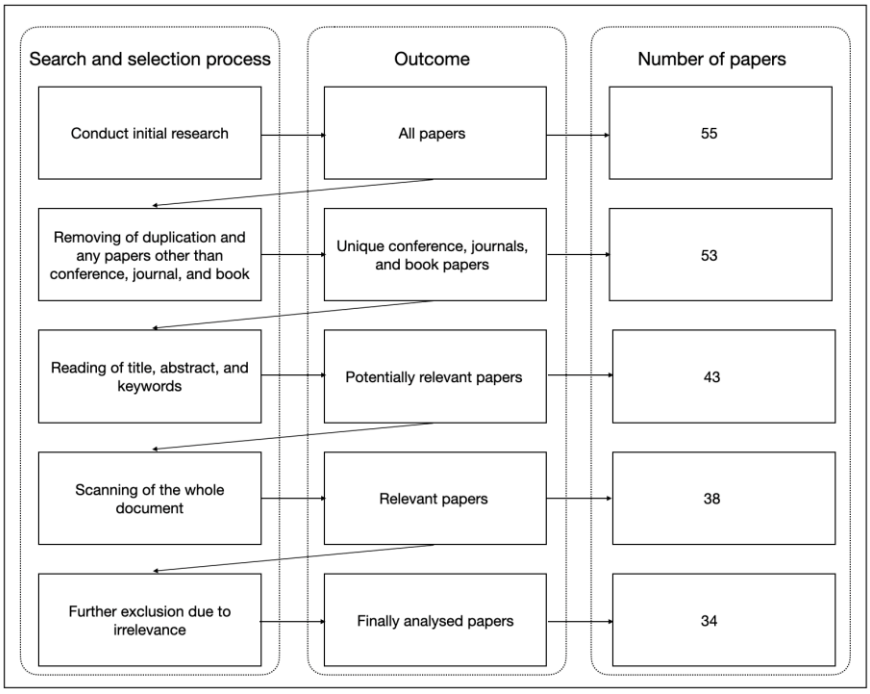

Fig 2. Search and selection process. Source: Own elaboration

STEP 4

In this step all selected papers were analysed based on the grounded theory method. Three stages of coding - open coding, axial coding, and selective coding - were performed. Atlas.ti was applied for extracting the data and coding.

First, an open coding was conducted in order to identify the core concepts and their characteristics and dimensions. Open coding is applied for identifying, labelling, or making a group of concepts and insights based on the extracted codes (Wolfswinkel et al., 2013). The initial categories of the blockchain adoption in tourism were extracted.

Second, the authors performed an axial coding that is a process through which concepts are disaggregated into their components. Hence, the concepts extracted during the open coding process were selected as categories and other synonymous concepts were linked to them. The categories in axial coding were developed systematically and related to the subcategories. Axial coding results in building a model that will identify the relationship between each of the categories (Shafiee et al., 2019). Based on Strauss and Corbin (1990) we identified the following categories: causal conditions, context conditions, intervening conditions, core phenomenon, actions/interactions, and consequences. In the coding model, the core phenomenon is affected by the causal conditions. The core phenomenon, context conditions, and intervening conditions affect the interactions that have impact on the consequences (Creswell, 2005). Given the research aim, blockchain adoption was selected as core phenomenon. The categories and their related concepts are presented in Table 2.

Category	Final code extracted	References
Causal conditions	Blockchain benefits	Barrio et al. (2020),Dogru et al. (2018), Pilkington et al. (2017), Karamchandani et al. (2020), Rashideh (2020), Tham and Sigala (2020), Treiblmaier and Önder (2019)
	Bitcoin´s wide universality	Leung and Dickinger (2017)
	Increasing interest and investment in blockchain	Kizildag et al. (2019)
	Strategic orientation	Filimonau and Naumova (2020), Nurryev et al. (2020)
Context conditions	High operating cost	Di Vaio and Varriale (2020), Filimonau and Naumova (2020), Korze (2019), Kizildag et al. (2019), Nam et al. (2019), Valeri (2020)
	High energy consumption	Korze (2019), Nam et al. (2019), Tham and Sigala (2020), Valeri (2020)
	Lack of awareness about data security	Erceg et al. (2020), Tham and Sigala (2020)

Category	Final code extracted	References
	Lack of knowledge and expertise about blockchain	Barrio et al. (2020), Calvaresi et al. (2019), Di Vaio and Varriale (2020), Karamchandani et al. (2020), Kizildag et al. (2019), Korze (2019), Leund and Dickinger (2017), Nam et al. (2019)
	Access to the internet via mobile telephony	Barreto et al. (2019)
	Blockchain technical issues	Barrio et al. (2020), Filimonau and Naumova (2020), Kizildag et al. (2019),Korze (2019), Nam et al. (2019), Valeri (2020)
	Network infrastructure	Barreto et al. (2019), Di Vaio and Varriale (2020), Erceg et al. (2020), Filimonau and Naumova (2020), Kizildag et al. (2019), Pilkington (2017)
Intervening conditions	Government regulation	Barreto et al. (2019), Ćirić and Ivanišević (2018), Erceg et al. (2020), Filimonau and Naumova (2020), Kizildag et al. (2019), Varelas (2019)
	Collaboration among all stakeholders	Antoniadis et al. (2020), Barreto et al. (2019), DI Vaio and Varriale (2020), Kizildag et al. (2019), Tham and Sigala (2020)
Actions/Interactions	Access to bitcoin accounts for small merchants	Barreto et al. (2019)
	Fast and secure use of cryptocurrency payments for travel-related services	Antoniadis et al. (2020), Barrio et al. (2020), Bodkhe et al. (2019), Erceg et al. (2020), Dogru et al. (2018),Filimonau and Naumova (2020), Karagoz Zeren and Demirel (2020), Kizildag et al. (2019), Kocic and Popovic (2018), Korze (2019), Leung and Dickinger (2017), Nam et al. (2019), Pilkington (2017),Rashideh (2020), Rejeb and Rejeb (2019), Valeri (2020), Willie (2019)
	Use of coins and tokens as rewards	Nam et al. (2019), Pilkington et al. (2017)
	Possibility of fundraising	Antoniadis et al. (2020), Tham and Sigala (2020)
	Cryptocurrency creation	Kocić and Popović (2018),Ying et al. (2018)

Category	Final code extracted	References
	Authenticate customer reviews	Bodkhe et al. (2019), Filimonau and Naumova (2020), Kizildag et al. (2019), Pilkington (2017), Rejeb and Rejeb (2019)
	Avoid overbooking and double booking	Bodkhe et al. (2019), Varelas (2019)
	Use of digital ID	Bodkhe et al. (2019), Dogru et al. (2018), Kizildag et al (2019), Korze (2019)
	Enhance loyalty programs and reward systems	Antoniadis et al. (2020), Bodkhe et al. (2019), Dogru et al. (2018), Erceg et al. (2020), Filimonau and Naumova (2020),Karagoz Zeren and Demirel (2020), Kizildag et al. (2019), Korze (2019), Nam et al. (2019), Pilkington (2017), Rejeb and Rejeb (2019),Udegbe (2017), Valeri (2020)
	Improve service quality	Karamchandani et al. (2020), Kizildag et al. (2019), Korze (2019), Willie (2019)
	Enable tourism products and activities traceability	Baralla et al. (2018), Dogru et al. (2018), Filimonau and Naumova (2020),Pilkington (2017), Rejeb and Rejeb (2019),Tham and Sigala (2020), Willie (2019)
	Track luggage	Bodkhe et al (2019), Korze (2019), Rejeb and Rejeb (2019), Valeri (2020)
	Share sensitive information	Kocić and Popović (2018), Pilkington (2017), Shrestha (2017), Willie (2019)
	Provide best deals	Pilkington et al. (2017), Rejeb et al. (2019), Varelas (2019)
	Disintermidiates hospitality and tourism operations	Antoniadis et al. (2020), Filimonau and Naumova (2020), Kizildag et al. (2019), Polukhina et al. (2019), Rejeb et al. (2019), Rejeb and Rejeb (2019), Ying et al. (2018)
Consequences	Attracting visitors to the destinations that lack comparative advantage	Antoniadis et al. (2020)
	Reshaping the tourism industry and promoting tourism development	Antoniadis et al. (2020), Kizildag et al. (2019), Korze (2019), Rashideh (2020), Rejeb and Rejeb (2019), Treiblmaier and Önder (2019), Willie (2019)

Category	Final code extracted	References
	Medical tourism development	Pilkington (2017), Rejeb et al. (2019)
	Smart tourism development	Antoniadis et al. (2020), Kizildag et al. (2019)
	Contributing to the successful competitiveness and development of SMEs	Nurryev et al. (2020), Treiblmaier and Önder (2019)
	Reducing poverty	Barreto et al. (2019), Pilkington et al. (2017)
	Enhancing tourist experience	Dogru et al. (2018), Erceg et al. (2020), Rejeb and Rejeb (2019), Willie (2019)

Table 2. The category, concept, and final codes extracted. Source: Own elaboration.

Third, a selective coding, where the categories are integrated and improved to formulate a theory (Shafiee et al., 2019), was performed. The authors integrated the categories, secondary categories, and their relationships and developed the primary theoretical model based on the obtained data. A summary of three coding processes is shown in Table 3.

Step	Coding type	Process	Result
1	Open coding	Primary coding of papers	Registering 209 open codes
2	Axial coding	Identifying and determining main categories	Developing six main categories
		Making relationships between main category and sub-categories	Developing 35 sub-categories
		Extracting the main categories and defining the relationships	Primary structure of the model
3	Selective coding	Evolution and interpretation of the theory	Proposing the model

Table 3. A summary of coding processes. Source: Own elaboration.

STEP 5

In this step we present the findings. The authors elaborated a conceptual model for blockchain adoption in the tourism industry based on the analysis of the blockchain characteristics and impacts on the tourism sector. Fig 3 depicts a conceptual model for blockchain adoption in tourism.

In the present model, the core phenomenon is blockchain adoption. The concepts related to blockchain adoption are grouped in the causal conditions section. All the interactions that are obtained from blockchain adoption in tourism are classified in the actions/interactions section. The context and intervening conditions affect the interactions. The results of blockchain adoption are defined in the consequences section.

An analysis of the articles revealed the following causal conditions that contribute to blockchain adoption in the tourism industry: blockchain benefits, bitcoin's wide universality, increasing interest and investment in blockchain tourism projects, and strategic orientation of the tourism enterprises. Among intervening conditions of blockchain adoption are government regulation and collaboration among all stakeholders including governments, destination management organisations, tourism service providers, and researchers. The lack of regulatory policies slows the adoption of blockchain in many countries. In addition, the focus should be emphasised on the context conditions for adopting blockchain in the tourism industry. Economic, educational, and technical factors have been found to be the most important conditions for blockchain adoption. High operating cost and high energy consumption are classified as economic conditions; lack of awareness about data security and lack of knowledge and expertise about blockchain are categorised as educational conditions; access to the internet via mobile telephony, blockchain technical issues, and network infrastructure are categorised as technical conditions. Without meeting these conditions, adoption of blockchain technology in tourism will be quite a slow process. According to analysis, the interactions obtained from blockchain adoption were classified as economic and social actions. Regarding economic actions, blockchain adoption enables access to cryptocurrency accounts for small merchants who don't have a traditional bank account; fast and secure payments for travel-related services; use of coins and tokens as rewards; possibilities for fundraising; cryptocurrency creation by the tourism destinations themselves; hospitality and tourism disintermediation that results in cost reduction. egarding social actions, blockchain adoption makes it possible to authenticate customer reviews, fast identification and verification using digital ID, enhance loyalty and rewards programs, improve service quality, trace tourism products and activities, provide best deals for the tourists, track luggage, and share sensitive information about the tourists. Finally, blockchain adoption will result in reshaping the tourism industry and promoting tourism development, attracting visitors to less competitive destinations, developing smart tourism and medical tourism, contributing to the successful competitiveness of small and medium tourism enterprises, reducing poverty, and enhancing tourists' experiences.

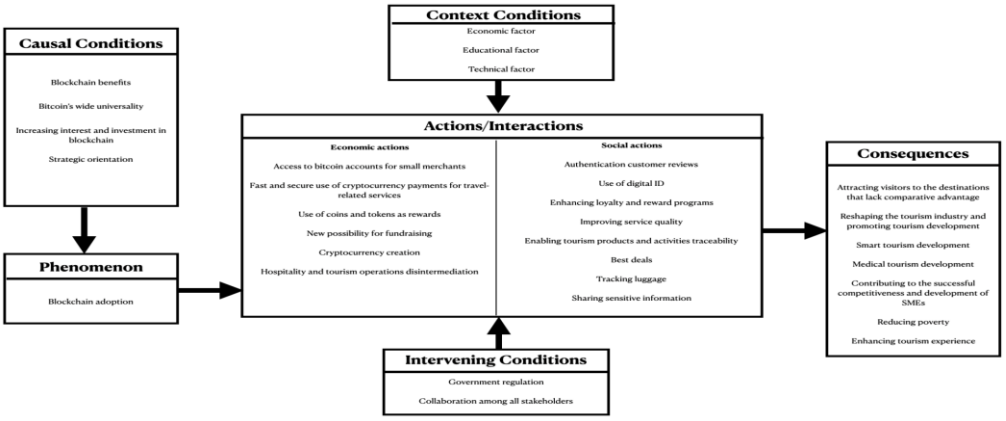

Fig 3. Conceptual model of blockchain adoption. Source: Own elaboration

Implications

Kizildag et al. (2019) admit that a conceptualisation of the functionalities of blockchain adoption is valuable to both academics and practitioners. Addressing this issue, our study makes significant theoretical and practical contributions. From a theoretical perspective, the main contribution lies in presenting a conceptual model for blockchain adoption in the tourism industry. Our model contributes to the body of knowledge within a blockchain tourism research and enhances understanding regarding important factors affecting blockchain adoption. Additionally, our model summarises the consequences resulting from the adoption of blockchain technology, and therefore, extends the few existing studies, which addressed the possible effects of blockchain adoption in the hospitality and tourism sectors (Valeri, 2015). Also, by defining the casual, contextual, and intervening conditions, this research enables the academics to understand the necessary conditions for fostering blockchain adoption within the tourism industry. Furthermore, our proposed model provides avenues for future academic research. As such, the researchers can explore the impact of each factor influencing adoption of blockchain technology and empirically test the model to validate it.

From a practical perspective, the model provides value to the stakeholders, including destination managers, tourism enterprises managers, tourism marketers, and policymakers. Identifying the factors influencing blockchain adoption may help develop a necessary infrastructure for embracing blockchain technology within the tourism sector. Understanding the importance of government support and regulatory policies, the policymakers may issue laws favourably regulating cryptocurrency use that will affect widespread adoption of blockchain technology. Defining the advantages and benefits resulted from blockchain adoption, not only major

companies, but also small and mid-sized tourism enterprises can decide whether they should invest in blockchain adoption or not.

Conclusion

This study tries to move forward blockchain tourism research and primarily focuses on blockchain adoption. The study conducted grounded theory method-based literature review of the studies within a blockchain tourism domain and through identifying causal, contextual, intervening conditions, actions, and consequences proposed a conceptual model for blockchain adoption in tourism.

The research provides value for both academics and practitioners providing venues for future research and highlighting the important conditions necessary for blockchain adoption. Based on the proposed model, the stakeholders interesting in blockchain adoption can enhance the awareness and understanding regarding the technology, its benefits, and crucial factors affecting its adoption.

Since the research on the topic is very scarce, the study extends the existing literature. Regarding future studies, the scholars can analyse the causal relationships between variables and assess real benefits of blockchain adoption.

However, this study bears some limitations. First, the research used data from the selected papers only. Second, the results were obtained through a qualitative systematic review, and were not confirmed quantitatively. Third, a theoretical model was proposed without empirical testing and validating. Therefore, future studies are encouraged to empirically validate the proposed model as well as investigate other conditions, actions, and consequences that have not been explored in the present research because of practical limitations.

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