

Strategic Innovations in Tourism Enterprises Through Blockchain Technology



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Abstract Over the last years blockchain technology continuously evolving. Blockchain is known as the technology behind Bitcoin, but beyond its use in the transactions improvement has also change the way in which data and information are used. Blockchain due to its characteristics of transparency, security and decentralization expanding to more and more fields of the industry. This study aims to present the blockchain technology and in a more detailed look the ways in which this technology benefits the tourism enterprises through its potential uses.

Keywords Blockchain · Smart contracts · Tourism · Strategic

1 Introduction

The creation of the first cryptocurrency in 2008 by Satoshi Nakamoto [1] provided a substantive solution to the problem of the double spending [2]. As a result it has been created a new decentralized payment system between peer-to-peer users who can now deal directly with each other without the need for a third-trusted member. This was made possible by the use of blockchain technology which initially functioned as a public, decentralized platform for recording Bitcoin's cryptographic transactions. Over time the capabilities presented by blockchain technology have led to its further evolution. This has resulted in the extension of its use not only to cryptocurrencies

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transactions, but also in the handling of various other financial items such as contracts, stocks, property titles or voting results [3]. In particular, modifications to the software code may change the nature of the blocks in the chain thus creating different kinds of databases to perform and store.

2 Key Features of Blockchain

As already known, digital coins do not have a physical form but are reflected as digital information. We can imagine the blockchain network as the accounting books kept by a central bank to record all transactions, with the difference that the blockchain does not belong to any central authority but it is public and accessible to everyone. Everyone can have a “copy of this book” at any time while the user’s personal information is not obvious but encrypted.

In other words, the blockchain network can be described as a digital platform in which the entire transaction history is validated and stored between network users [4]. To put in another way blockchain is a shared and distributed database which uses cryptographic methods to store information which cannot be reversed [5].

In the blockchain network everyone can make entries but in order for a block to be added to the chain it need to be validated by the other users. Therefore, group consensus of users is required to validate a transaction [2]. When the transaction is added to the block there is neither the possibility to modify it nor to delete it [6]. The only way to correct a wrong transaction and be recovered, is by returning it to the payee to re-execute it correctly [7]. This irreversibility of transactions is another important feature of this technology [7]. Every transaction after being validated locked into a block. Each block is cryptographically associated with the previous blocks of validated transactions, creating a chain. The same procedure will make the connection for the remaining future blocks. In fact, the blockchain is a logging technology [8] as this sequence creates a validated and sustained history of transactions [9] while the fixation of block records enables network users to verify an event at any time [5]. “Anyone can check the database but cannot modify it” [10].

In recent literature blockchain technology is also referred as Distributed Ledger Technology. This technology has the ability to distribute data as the blockchain database is not stored on a website but to all nodes participating the network. Since one piece of information is stored to all nodes at the same time, it is unlikely that a hacker will change any of the stored data because it will have to be changed at the same time to all computers in the network. This gives blockchain great security features. Moreover, blockchain is a technology that has the feature of decentralization. This implies that, unlike most sites belonging to one central server, the blockchain network is distributed among each single node of the network. Peer-to-peer access means that all nodes participating in the network have equal rights and obligations. As a result, no one is required as a guarantor because since the information is publicly displayed and validated throughout the network, there is the transparency that is needed to eliminate any need for trust.

A Blockchain platform may be public, private [11] or consortium [12]. On a public platform, everyone can participate in the consensus mechanism and is therefore decentralized. On a private platform, the right to change the block belongs to specific individuals or groups of people [7], for this reason is characterized as fully centralized. Finally, a blockchain syndication environment is partially centralized as it is usually created by several organizations that enable nodes to engage in the consensus process [12].

3 Blockchain 2.0

3.1 The Ethereum Platform

While blockchain technology has been established as a decentralized trading platform in cryptocurrencies, blockchain 2.0 technology offers the extra ability to exchange values [10]. Furthermore, the applications run on the platform just as they are planned, without being interrupted or interfered but are automatically executed while proving property ownership [10]. In simple terms, this technology gives people the ability when make a deal to record this agreement in a safe and verifiable way [5].

The above mentioned development came in 2014 when the Ethereum platform was created as a public and open source application based on blockchain technology. Ethereum network does not considered just a payment system like Bitcoin but a platform designed to allow the development of any decentralized application [13]. We could say that Ethereum's platform is not a copy of Bitcoin's platform but its evolution.

The Ethereum platform has created its own cryptocurrency called Ether and covers a wide range of applications in areas such as Governance, crowdfunding or financial derivatives. The Ethereum platform uses blockchain technology, with the exception that its blocks in addition to cash registers can be registered and scheduled commands. This is its great innovation that came from the creation of the so-called smart contracts.

3.2 Smart Contracts

Smart contracts are an idea of Szabo who had described them as “computer protocols that executes the terms of a contract”. This idea eventually took place 20 years later on the Ethereum's platform. Unlike Bitcoin's platform, that of Ethereum allows the execution of smart contracts due to the fact that it is an open source platform [10].

Smart contracts are legal provisions that have been standardized in a computer code in such a way that when they executed, automatically apply agreement [5]. In

other words, smart contracts have the potential to perform, enforce and verify the implementation conditions of a contract [14].

The terms of delivery or purchase of a contract are entered into a form of computational commands and executed through blockchain technology. When the terms of the contract are fulfilled, the contract can be executed automatically without intervening intermediaries.

The fact that smart contracts are executed through blockchain technology means in principle that they cannot be violated by anyone, and in addition to that, each contract is recorded in the distributed database [10]. Smart contracts provide objectivity which reduces the chances of disagreement, but even in case of changes in the agreement there is the possibility to integrate into contract mechanism for their resolution [14].

According to recent report [5], smart contracts can be evolved in the future to perform more functions such as automated employees' payrolls or to complete automated complex securitisations without the need to interfere with custodians. Additionally, smart contracts have the potential to replace even the escrows provided by banks in asset transfer contracts [6].

4 Strategic Innovations Through Blockchain

4.1 Potential Uses of Blockchain Technology

Although blockchain technology is mainly used in the financial sector, more and more applications have begun to be tested in a number of other areas. According to that, the blockchain network could significantly help in the management and analysis of the Big Data domain, as it can ensure the storage, the security and the data distribution in a faster, easier and more efficient way [12]. In addition, the authenticity of data provided through this technology may be useful in the health sector. For example, blockchain could be useful to store patient histories so that they cannot be falsified while keeping medical confidentiality [12]. It is also believed that this technology could be used by regulators to automatically tax the transactions that take place, as each transaction in a blockchain environment will be publicly visible [4]. Another interesting use of this technology is in voting [3, 4] as it allows citizens to vote anonymously while ensuring non-falsification of the outcome while at the same time reducing the public cost resulting from the conduct of the elections. Also important is the prospect of blockchain application for hotel bookings, which could be done automatically using smart contracts without human intervention [2].

4.2 How Can Blockchain Benefit the Travel and Tourism Industry?

It is a fact that Online Travel Services presents some drawbacks that may be encountered in issues such as: the double bookings, the unfair foreign exchange rates (especially when traveling internationally) or the security risk, since your money and your privacy rely on the payment service provider. Furthermore, the use of credit cards incurs high charge commissions and transaction fees. In addition, agencies between the customer and the operator works with a high-profit margin which may causes the price to increase up to 15–40%. Also important is the fact that, the customer usually spend a lot of time navigating to a lot of websites in order to find the best deals for hotels and flights.

At the level of strategic innovation planning [15–17] and in order to solve the above mentioned problems, many start-up companies, using the blockchain and its applications to make innovative projects with some of which to stand out for the following features:

- Re-booking feature for hotel rooms when rates are lowered. Customer receives price drop notification and the difference is credited back to the users account [18]
- No Double Booking: Using smart contract system and blockchain transparency, potential double booking or double spending will be eliminated [19]
- Real Time Booking: Through blockchain's innovative projects solution, travelers will have bookings confirmed in realtime [20, 21]
- Blockchain platform apps allows users to resell their tickets via a peer to peer secondary market [21, 22].
- Cheapest package deals through the integration of all major travel mediums in a single platform.

5 Conclusion

To conclude, Blockchain is a technology that can create “future innovations” [23] so many compare their evolution with that of the Internet. There is no doubt that blockchain technology can bring significant strategic innovations to the tourism sector but also in other sectors [24–27]. However, we must not ignore the fact that the innovations brought by blockchain technology raise several legal and regulatory issues related to risk, privacy and security. This is due to the fact that the existing regulatory framework is neither fixed nor straightforward. For this reason, blockchain technology often characterized as a “double-edged knife”. The features of decentralization, security and transparency in some cases may help to combat fraud and corruption, but if the proper infrastructure does not exist, it can lead to a distortion of the market structure. This means that there must be specific policies that will help maximize blockchain's benefits without affecting negatively other areas.

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