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RESEARCH NOTE

The token economy as a key driver for tourism: Entering the next phase of blockchain research

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ABSTRACT

This is a research note in which I briefly outline the advantages of discussing tokens in tourism research rather than referring to the rather unspecific terms "cryptocurrencies" or "blockchain".

Introduction

The emergence of blockchain technology has been labeled a "paradigm shift" for business practices in the tourism and hospitality industry and numerous untapped potentials have been identified. Among others, these include payment services, tracking and service customization, disintermediation of hospitality and tourism operations, loyalty programs, property management systems, rating and review systems, and smart tourism in general (Kizildag et al., 2020). Specific use cases refer to the management of hotel inventory, tracking and tracing of food supply chains, and managing reservations and ticketing (Treiblmaier, 2020). This non-exclusive list of blockchain-based applications in the tourism and hospitality industry gives a brief glimpse into what kind of transformational changes might be expected in the near future. According to scholars and industry experts, blockchain might not only fundamentally change and disrupt the operations of single companies, but rather impact the tourism and hospitality industry as a whole, including the ways in which companies collaborate in intricate value networks (Önder & Treiblmaier, 2018). However, blockchain is more than one single coherent technology and comes in many different forms (i.e., implementations) that substantially differ in their inner workings and functionality. Consequently, shifting the focus of attention away from the underlying technology and toward its intended uses allows for a better evaluation of the applicability of this versatile technology. In the remainder of this research note we briefly elaborate on the problems that arise from using the broad term blockchain, introduce tokens as specific blockchain-based applications that might clarify the user perspective, and suggest three straightforward questions that every blockchain or token-related paper in tourism research should answer.

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Blockchain as an umbrella term

The basic functioning of blockchain and its impact on the tourism industry has been outlined in numerous other publications (e.g., Ampountolas & Ampountolas & Chiffer, 2021; Rashideh, 2020) and will not be reiterated in detail here. Furthermore, empirical studies have already been conducted that focus on specific blockchain use cases, such as the adoption of cryptocurrencies among travelers (Treiblmaier et al., 2020). In a nutshell, blockchain is a collective term for ledgers that allow for the storage of data, frequently in the form of transactions, in a distributed manner. This not only makes them practically immutable, but also exhibits favorable properties such as shared data access for network participants in real-time, control over data accessibility, and easy auditability.

Two major issues in the current blockchain discussion make existing research difficult to compare and impede the development of an incremental research agenda: First, Blockchain is not a uniform technology, but rather a clever combination of key ideas such as linked timestamping, digital cash, proof-of-work, Byzantine fault tolerance, asymmetric cryptography, and smart contracts (Narayanan & Clark, 2017). From both a technical and a governance perspective, a private and permissioned blockchain with a number of dedicated nodes that validate transactions differs markedly from a public and permissionless network that allows free access for all participants and has no pre-specified governance rights. Additionally, hybrid forms have been developed that further complicate a clear demarcation. Second, the various building blocks are under constant development, leading to continuous improvements as well as the frequent introduction of novel applications. The heterogeneity of the technological foundations, in combination with ongoing development, often makes it hard to directly compare different technical solutions and their respective properties.

For example, the underlying governance structure and economic philosophy of Facebook's proposed digital asset, Diem (formerly known as Libra), differs substantially from the cryptocurrency Bitcoin. Bundling those two under the common designation “cryptocurrency” blurs their respective intentions and would distort the findings from, for example, a survey inquiring into travelers' motivations to use cryptocurrencies for payment purposes in the tourism and hospitality industry. A further illustration is the replacement of online booking hubs through blockchain-based service aggregators, with the proposed solutions varying widely based on their governance structure, revenue model, and offered service level.

Blockchain research is therefore a widely dispersed field that brings together computer scientists and cryptographers, as well as applied researchers who are specifically interested in the business and economic implications. Scholars in the tourism and hospitality sector can be assigned to the latter category. This situation is comparable with research investigating the Internet, in which scholars with a technical focus might be interested in the underlying nuts and bolts of the technology, whereas applied researchers rather concentrate on applications that can be built on top of the technology stack and the transformative changes that they bring about. In the context of blockchain, a potential solution for applied research is to focus on tokens that are built on top of the technology stack. This is especially important for understanding the perspective of end users such as travelers and tourists. These tokens represent value and are predicted to lead to the emergence of the so-called token economy.

Token definition and classification

A token created by a blockchain-based ecosystem can be defined as a unit of value that represents an asset, specific use, or form of payment. Tokens are usually fast and easy to trade with low transaction costs. As can be seen in Table 1, tokens can be distinguished into the different classes of utility tokens, payment tokens, and investment tokens, depending on their respective use case. The roles that tokens play include the bestowing of a right to their owners, helping to exchange value, allowing access a platform or services (toll), enriching user behavior (function), enabling frictionless transactions (currency), or receiving a fair redistribution of value (earnings) (Mougayar, 2017). Tokens represent underlying assets or rights, which might either be digital, physical, virtual or legal. Their supply might be fixed or can be changed according to specific, pre-defined rules. Furthermore, tokens provide incentives to enter and use a particular platform. Regarding their interchangeability, tokens can be differentiated into fungible (i.e., “identical”) and non-fungible tokens, the latter of which represents something unique. Finally, the layer refers to whether the token is an integral component of a blockchain, resides on a protocol, or is created by an application.

The multitude of potential token applications necessitates a clear definition of their core characteristics and roles. A comprehensive description of tokens not only allows for an easy explanation of the underlying business model and governance

Table 1
Token classification slightly modified from Euler (2018) and Oliveira et al. (2018).

Class	Payment token		Utility token		Investment token	
Role/purpose	Right	Value exchange	Toll	Function	Currency	Earnings
Representation	Digital	Physical	Virtual	Legal		
Supply	Fixed		Schedule-based			
Incentive system	Enter platform		Use platform	Stay long-term		
Fungibility	Fungible		Non-fungible			
Layer	Blockchain (native)		Protocol (non-native)	Application (dApp)		

structures, but also clarifies the kind of benefits that consumers, such as travelers or hotel guests, get in return. In other words, a thorough description of a token ensures that both the perspective of the token supplier and that of the token recipient are simultaneously considered. Rather than just referring to a blockchain-based solution, tourism researchers should therefore describe a particular application and its core features.

Reporting token applications in tourism research

A clear description of a token application in a tourism or hospitality application helps to sharpen the focus and to understand its main characteristics and application scenarios. For example, in a comparison study of different decentralized applications (DApps), Ozdemir et al. (2020) included brief descriptions of the tokens that were used. We suggest taking this approach one step further by explicitly addressing three questions in every token study. Table 1 provides a general framework as a starting point:

a) Question 1: What is the token used for?

In a first step, researchers need to clarify the functionality, role, and purpose of a particular token. In the tourism industry, tokens can be used to pay for goods and services, present access rights to hotel rooms, facilitate bookings, help to create loyalty networks among consumers, or even represent a stake in a service provider, to name just a few.

b) Question 2: How does the token work?

To account for the numerous differences and intricacies of blockchain implementations from an end user perspective, researchers need to specify what the token represents, how the supply is managed, and the underlying incentive system and infrastructure, which also includes the governance model. Tokens that function as money to reward travelers and build customer relationships need to be designed very differently from tokens that guarantee bookings or solutions that accelerate data flows between travelers and custom agents.

c) Question 3: Why is the token applied?

Finally, the hypothesized impact of the token deployment needs to be described. This includes performance gains for tourism companies, changes in consumers' behaviors and attitudes, as well as the generation of positive and negative externalities, some of which might not have even been expected. Better service levels for travelers, for example, might go hand in hand with increased privacy concerns and legal complications.

Taken together, these three questions provide a solid foundation for any blockchain study in tourism and hospitality research that goes beyond treating the technology as a uniform technology having a set of presumed characteristics. This is especially true for research that has an end user perspective. From an academic perspective, tokens can rather easily be integrated in rigorous theory-based research. For example, in Transaction Cost Analysis (TCA) digital assets can represent transaction costs and in principal agency theory (PAT) tokens can take over the roles of intermediaries. The Technology-Organization-Environment (TOE) framework provides a model for analyzing the disruptive change of tokens at different levels, while the widely popular group of theories pertaining to technology adoption and acceptance helps to better understand the underlying motives for using a particular technology, or not. In a similar manner, tokens can easily be integrated in other models, frameworks, and theories as clearly specified antecedents or consequences of technological change. Again, it is crucial that specific applications are investigated instead of asking organizations and consumers simply about blockchain or cryptocurrencies in general.

Summarizing, the analysis of blockchain-based applications in tourism and hospitality on the basis of the specific token applied gives a better understanding of the underlying rationale, technology, and functionality of an application than mere reference to a "blockchain solution". Discussing a particular token and its respective use case therefore enables a clearer comparison of blockchain solutions to facilitate an incremental tourism research agenda as well as opening up a plethora of well-defined yet novel research opportunities.

Declaration of competing interest

None.

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