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Research Note

Blockchain and tourism: Three research propositions

Irem Önder[a,*], Horst Treiblmaier[b]

[a] MODUL University Vienna, Department of Tourism and Service Management, Am Kahlenberg 1, A-1190 Vienna, Austria
[b] MODUL University Vienna, Department of International Management, Am Kahlenberg 1, A-1190 Vienna, Austria

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The tourism industry has been changing rapidly since the Internet has enabled customers to search for and book their travel products online. As a result, many companies such as Airbnb and Uber are moving away from traditional business models and toward consumer-to-consumer models. In order to satisfy customers' needs, the tourism industry has had to combine money, technology and knowledge to build new and innovative platforms (Colombo & Baggio, 2017).

The advent of blockchain technology and especially the success of its most prominent application to date, the cryptocurrency Bitcoin, has triggered a lot of media attention in recent years and created a huge amount of interest across various industries. Bitcoin has already been accepted by the European Court of Justice as a valid currency and is exempt from sales taxes (Titcomb, 2015). Tourism is no exception, with major companies such as TUI already adopting blockchain technology in its booking, reservation and payment systems (Sixtin, 2017) and huge amounts of money being invested in promising start-up ventures (Aitken, 2016). Other examples in the tourism industry that accept bitcoins as a payment include CheapAir, Expedia, One Shot Hotels, and Webjet (Chokun, 2016). However, Leung and Dickinger (2017) note that the use of bitcoins for travel purchases is still in its early stages and consumers in general lack knowledge.

In contrast to the strong interest from practitioners, most academic communities have been slow in picking up the blockchain and investigating its potential implications. This can be partly attributed to lengthy publication cycles, but also to the novelty of the topic and the difficulties this poses for many researchers to integrate it into their existing research agendas.

A blockchain is a distributed database that is made up of a list of transaction bundles called blocks that are attached to each other. Under normal circumstances[1] these blocks, which in their entirety are also called a distributed ledger, cannot be modified once they are accepted as parts of the total chain in a sophisticated non-centralized procedure. Blockchain technology is not administered by a central server, but constitutes a peer-to-peer network in which decentralized nodes keep copies of the whole blockchain. The task of adding and verifying new transaction records is taken over by so-called miners, which need to solve a computationally difficult problem and get rewarded for contributing their resources (Narayanan, Bonneau, Felten, Miller, & Goldfeder, 2016). Platforms such as Ethereum have emerged in the wake of Bitcoin, and build upon blockchain technology through the deployment of so-called smart contracts that enable the trusted conclusion of online agreements between parties who need not even know each other. The power of digital currencies in combination with smart contracts has the potential to prove highly disruptive technologies for many industries (Giancaspro, 2017).

In spite of the dearth of existing scholarly literature, especially in the business field, many academics agree that the transactional

* Corresponding author.
E-mail addresses: irem.onder@modul.ac.at (I. Önder), horst.treiblmaier@modul.ac.at (H. Treiblmaier).

[1] Blockchain technology suffers from various (potential) problems. The blockchain network itself can be attacked if a potential attacker controls more than half of the network's hashrate (i.e., "majority attack" or "51% attack"). This has not happened on the Bitcoin network yet, but an alternative currency named Coiledcoin was destroyed by such an attack.

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and economic implications of the blockchain will be substantial for many areas (Iansiti & Lakhani, 2017). Theoretical frameworks and research propositions are thus needed to create a comprehensive tourism blockchain research agenda.

In this research note we present three high-level propositions which are intended to be further refined and elaborated by the tourism research community. These propositions are closely interwoven, with the first two focusing more on the consumer perspective and the latter investigating market implications.

Proposition 1

Online consumer reviews of tourism products influence consumers purchasing decisions. Novice users in particular tend to trust online reviews and consider them as honest opinions from real travelers (Filieri, 2016). However, the trustworthiness of these reviews is sometimes questioned, since centralized systems can be manipulated by industry players such as hotels and restaurant owners as well as consumers. In order to have fair online reviews, a common review and rating system which provides individuals with traceable identities could be created as part of the blockchain. This does not necessarily mean that personal identities have to be revealed, but merely that all entries are signed with a unique private key which confirms that a specific transaction comes from a particular user. As a result, users would be unable to create duplicate reviews with the same identity and no one will be able to manipulate reviews ex post.

Research proposition 1: New forms of evaluations and review technologies will lead to trustworthy rating systems.

Proposition 2

Tourism products frequently involve the transfer of money across country borders and between partners who had no previous business relationship. A certain amount of trust is therefore needed, and intermediaries are frequently used in order to mitigate the risk of non-fulfillment of contracts. In those cases, however, the intermediaries themselves need to be trusted and they obviously charge a commission. Cryptocurrencies based on blockchain technology allow for the easy interchange of money without the need for trusted third parties, which enables the emergence of new forms of customer-to-customer (C2C) transactions in primary and secondary markets for tourism products.

Research proposition 2: The widespread adoption of cryptocurrencies will lead to new types of C2C markets.

Proposition 3

The biggest impact of blockchain on the travel industry will be an increasing level of disintermediation, which has become a major issue since the early 2000s when online travel agencies (OTAs) became popular among consumers. OTAs radically changed the structure of the market by shifting power from suppliers to consumers (Colombo & Baggio, 2017). The second wave of disintermediation can be triggered by the blockchain, which has the potential to remove the new intermediaries such as OTAs and Global Distribution Systems (GDS) from the tourism supply chain. Tourism value networks are usually based on power dependent relationships, which means that more powerful members have typically gotten more value from the partnership (Ford, Wang, & Vestal, 2012). For instance, small tour operators need to be part of a GDS in order to be competitive and must therefore comply with the stipulated rules and accept the mandated fees. Blockchain-based, open source and decentralized online travel platforms such as Windingtree (https://windingtree.com/) and HotelP2P (http://www.hotelp2p.com/) bear the potential to eliminate such intermediaries and their market power.

Research proposition 3: Blockchain technology will lead to increased disintermediation in the tourism industry.

This research note intends to spark an academic discussion regarding blockchain and its future impact on the tourism and hospitality industry. The potential of the blockchain and cryptocurrencies has already been recognized by the financial sector and big companies such as IBM, Deutsche Bank, HSBC, Société Générale and UniCredit, just to name a few, are currently building systems to facilitate trade for small and medium size companies (Arnold, 2017). Given the huge amount of money that is currently invested in blockchain-based solutions and their industry-spanning nature, it can be expected that the impact on the business sector will be substantial and that many of these effects will flow on to the tourism industry. This note therefore recommends that tourism researchers begin to investigate the blockchain from various angles in order to create relevant as well as rigorous research ideas and solutions.

References

Aitken, R. (2016). Blockchain startup TamTam eyes trillion Dollar travel industry offering 'Crypto'. *Forbes*. Available online: https://www.forbes.com/sites/rogeraitken/2016/11/01/blockchain-startup-tamtam-eyes-trillion-dollar-travel-industry-offering-crypto/#1f3012782b76 Accessed July 10, 2017 .

Arnold, M. (2017). European banks to launch blockchain trade finance platform. *Financial Times*. Available online: https://www.ft.com/content/6bb4f678-5a8c-11e7-b553-e2df1b0c3220 Accessed August 4, 2017 .

Chokun, J.. Who accepts bitcoins as payments? (2016). https://99bitcoins.com/who-accepts-bitcoins-payment-companies-stores-take-bitcoins/ Accessed August 3, 2017.

Colombo, E., & Baggio, R. (2017). Tourism distribution channels: Knowledge requirements. In N. Scott, M. De Martino, & M. Van Niekerk (Eds.). *Knowledge transfer to and within tourism: Academic, industry and government bridges* (pp. 289–301). Bingley, UK: Emerald.

Filieri, R. (2016). What makes an online review trustworthy? *Annals of Tourism Research, 58*, 46–64.

Ford, R. C., Wang, Y., & Vestal, A. (2012). Power asymmetries in tourism distribution networks. *Annals of Tourism Research, 39*(2), 755–779.

Giancaspro, M. (2017). Is a 'smart contract' really a smart idea? Insights from a legal perspective. *Computer Law and Security Review*. Available online: http://www.sciencedirect.com/science/article/pii/S026736491730167X Accessed July 15, 2017 .

Iansiti, M., & Lakhani, K. R. (2017). The truth about blockchain: It will take years to transform business, but the journey begins now. *Harvard Business Review,* (January–February), 118–127.

Leung, D., & Dickinger, A. (2017). Use of Bitcoin in online travel product shopping: The European perspective. In R. Shegg, & B. Stangl (Eds.). *Information and communication technologies in tourism 2017* (pp. 741–754). Springer.

Narayanan, A., Bonneau, J., Felten, E., Miller, A., & Goldfeder, S. (2016). *Bitcoin and cryptocurrency technologies: A comprehensive introduction.* Princeton: Princeton University Press.

Sixtin, E.. TUI tourism group will adopt Ethereum blockchain technology. (2017). https://btcmanager.com/tui-tourism-group-to-adopt-ethereums-blockchain/ Accessed August 2, 2017.

Titcomb, J.. Bitcoin is tax-free, European court rules. (2015). http://www.telegraph.co.uk/technology/news/11948222/Bitcoin-is-tax-free-European-court-rules.html Accessed August 3, 2017.