

Leading technologies in tourism: using blockchain in TravelChain project

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Abstract Our paper focuses on the leading and most novel technologies applied in tourism. Tourism constitutes one of the fastest-growing spheres of the economy and embraces many new approaches and advancements in digital technologies that help tourists, local residents, or stakeholders alike to better exploit the potentials of the tourist destinations. Thus, electronic and digital services (also called “e-services”) constitute an enormous potential for tourism industry.

Specifically, we employ a case study of a currently popular topic, namely blockchain technology. We study how it can be applied in practice in the current Russian tourism project TravelChain which aims to create a new tourism ecosystem. Using the available data and information, we analyse the causes of costs, and options for reducing them using the blockchain, for example, in the tourism industry.

1 Introduction

Economy is a system that is based on specific values. Within this context, value is a mechanism that coordinates the behaviour of the community. The latter can be subdivided into three main stages: production (meaningful actions, investments to achieve specific goals), accounting and updating (when the value becomes apparent and justifies previous actions). This is inherent to processes in the traditional economy. In capitalism, production tends to become more private, hierarchical and profit-oriented, its accounting is opaque, and update is under way on the markets only (Widmer 2011; or Sun et al. 2016).

In general, corporations rule production. The economy of joint consumption, or the sharing economy, assumes the transformation of production and consumption: sharing of things, or objects, without registering them as property. A good example can be a person who does not book a hotel for a vacation, or does not buy a house, but can easily rent one from another person on Airbnb service. However, if we distinguish the concepts, then peer-to-peer (P2P) economy (sharing economy) also implies the complete absence of an intermediary. In general, intermediation can be neglected. P2P, or from equal to equal, the transfer of benefits from person to person - is a system through which people ('peers') freely cooperate with each other to create common value in the form of common resources. In fully P2P-systems, production belongs to the community, it is horizontal and focused on social value, accounting is transparent, distributed and pluralistic. Thus, the society benefits from such a system (Pazaitis et al. 2017).

This process is known as peer-to-peer or social production. The term was defined by the lawyer Yohai Benkler (Benkler 2006), who describes the process of creating and distributing values. P2P infrastructure allows people to communicate, independently organize and, ultimately, create value together in the form of digital knowledge, software and design. Examples include Wikipedia, free open source projects such as Linux, Apache, Mozilla Firefox or WordPress, open source communities of Wikihouse, RepRap, and Farm Hack.

Sharing economy is characterized by cost reduction due to the elimination of intermediaries. Nevertheless, the services charge a fee to access sellers' databases, but it usually costs less. A more customer profitable business model becomes stable faster. The complexity, which the new model of economy has to overcome, is the lack of clear regulation (Fang et al. 2016). The well-known Internet sites present themselves as information services but do not provide services directly. Neither large companies that divide the market, nor the government, that loses taxes, enjoy such a situation.

This paper focuses on the ways how blockchain technology can be used in tourism projects. We describe the Russian tourism project TravelChain which aims to create a new tourism ecosystem. The paper is organized as follows: Section described blockchain technology and explains its usage. Section 3 outlines how blockchain might be used in tourism. Section 4 explains the prerequisites and the functions of TravelChain project designed in Russian Federation. Finally, section 5 provides results, conclusions and implications.

2 Blockchain technology and its usage

According to Don Tapscott CEO of the Tapscott Group, the blockchain is a distributed transaction log on which Bitcoin and other cryptocurrencies are based will have much more application scenarios than it seems and will redistribute crucially wealth in the global economy by changing the processes of wealth creation. Don Tapscott estimates that blockchain technology will allow billions of people who still do not have bank accounts to join the digital economy (Tapscott and Williams 2007). They will do this by performing financial transactions on a peer-to-peer network using mobile phones. Today, people can already make financial transactions over the phone by using the money in the operator's account, or via mobile payment system such as Kenyan M-Pesa. However, if something happens to the operator, users may lose their money. The blockchain-based mobile payment system can eliminate such risks by committing transactions without a third party. As a result, people who did not have access to banking services will join the digital economy.

Airbnb and Uber companies are often referred to as the sharing economy representatives. Though, Tapscott disagrees and says that these companies are mere 'aggregators of services' and more concerned with making money but not sharing (Gyödi 2019).

Airbnb and Booking once turned the tourism industry upside down. Never before has it been so easy to communicate with the owner or rent a house or an apartment. Despite all the convenience, the booking commission has not disappeared, and today it is still paid on the site. However, Winding Tree, a non-profit organization from Switzerland, seems to have found a way to circumvent the services commission. The team has created a specialized blockchain platform that allows its users to communicate and make travel-related deals, without any third-party fees. Some transaction costs will remain, although they will not be comparable to those of today. Blockchain allows eliminating extra travel expenses. As a result, both travelers and property owners will benefit from this. Meanwhile, we cannot expect Airbnb and other platforms to overlook such projects. Airbnb and other similar services will try to come up with something, as they see a real threat to their business from such platforms as Winding Tree.

The co-founder of the blockchain Start-up Anton Dzyakovsky believes that the blockchain will destroy such tourist business monopolies as Expedia.com, Travelocity.com, Priceline.com and even Airbnb, and in the future, blockchain may affect Russian platforms such as Aviasales, Onetwotrip and others (Akbar and Tracogna 2018). Blockchain allows its users to perform instantly all transactions between the buyer and the seller, which is much cheaper and more efficient and decentralized services will do the same thing.

Large companies are also studying the blockchain technology capacities and are considering options for creating an internal system of distributed registries, which will help optimize the company's processes, thus reducing the service costs (Önder and Treiblmaier 2018; Kwok and Koh 2018; or Hawlitschek et al. 2018). Therefore, it is not yet possible to predict whether small startups will be able to move monopolists aside or rather survive, since a more likely scenario is the one in which monopolists take over promising start-ups and eventually become even stronger. Innovations will help solve some problems that are referred to as a reality in any travel. In addition, tourists will have more opportunities for independent travel.

3 Blockchain in tourism

Several global intermediaries who share the distribution market for tourism services dominate the global tourism industry. Digital services are very important within this context (Chiabai et al. 2014; Abrham and Wang 2017; Radovic et al. 2017; or Shevyakova et al. 2019). In addition, intermediaries can affect the final prices for tourists, by raising commissions from suppliers and charging a fee for access to their IT systems thus affecting the quality of services (Vasylchak and Halachenko 2016). Let us take a closer look at what kind of intermediaries they are, how they work, and how they affect the prices of rooms and tickets (see Figure 1 that follows).

Global Distribution Systems (GDS) charge a monthly fee for access to their information system: from suppliers - for resource allocation, from agents - for booking. They do not exclude the commission from the reservation as well. These extra costs have considerably increased the cost of travel services, since hotels and airlines put them in the price, even if you are buying directly from those hotels and airlines. However, the companies cannot leave and lose such a sales channel. As soon as a hotel is in the GDS, its services become available to agents, therefore, they are better sold.



Fig 1. Intermediaries between a tourist and a hotel

Source: VC (2018)

Online Travel Agency (OTA) affects prices even more than GDS. OTA earns commissions when users book a hotel online. For instance, Booking.com can take from 10 to 30% from a reservation. In addition, OTA makes hotels provide them with a minimum price per room - the so-called 'rate parity'. Hotels cannot sell below that 'minimum price' anywhere: neither on their own websites nor offline. Otherwise, hotels may be fined or disconnected from the service for violation. Still OTA remains the main sales channel for many companies in hospitality industry. Let us consider the price formation, taking into account the OTA commissions:

- The hotel has calculated the cost and set the price for a room at 3000 rubles. It is not cooperating with the Booking.com yet, but it estimates that 70 percent of rooms can be regularly sold on Booking.com platform. Thence, it makes decision to start cooperation;
- The hotel cannot receive less than 3000 rubles per room, while the Booking.com charges a 20 per cent commission. Consequently, the price should be raised so that after deducting the 20 per cent commission the hotel still gets its 3000 rubles;
- Therefore, the hotel offers rooms on Booking.com with the price of 3,750 rubles ($3,750 - 20\% = 3,000$);
- The hotel also realizes that it does not have the right to sell rooms below the price posted on Booking.com, so on all other platforms and offline it shows the increased price at 3750 rubles.

As a result, tourists get unreasonably high price tags on other websites. Another layer in the tourism industry is Channel Managers - these are information systems - original gateways that connect via API to a number of OTA and GDS. They allow the hotel to manage sales channels and rooms from one place and provide convenient interfaces for managing reservations. They also contribute to the ultimate price of the rooms. However, unlike GDS and OTA, they will not significantly change the price tag. Channel Managers are more progressive and innovative companies, the competition motivates them to grow, and increase the coverage of accommodation sites, the speed of bookings processing, and offer hotels many useful features, such as integrated CRM, booking widgets and so on. Competition constrains them from unreasonable price raise.

The use of blockchain technology in tourism can be varied which is evidenced by a number of projects. LockChain eliminates resellers, improves quality and reduces costs; TravelChain provides an information

base, helps travellers with the best deals and many useful budgeting tips; Winding Tree reduces costs and simplifies the selection process.

4 TravelChain project

The Russian project TravelChain is envisaged for the creation of a unique database of tourists. The platform allows its users to store personal data in encrypted form, and the digital footprint (countries and places s/he visits, restaurants and cafes s/he eats at, and what kind of recreation s/he prefers) in the open from. Such an integrated decentralized global registry which shows both global trends and the wishes of each anonymous user, will allow each business to analyse market needs and make unique proposals according to B2P system principles.

TravelChain works closely with scientists from Novosibirsk in applying data processing and service analysis by the use of artificial intelligence and machine learning. The priority will be to attract tourists who will begin to enrich the database. Later, when there will be data of at least 1 million users in the databases, businesses will log in and begin to buy these data and offer their potential customers goods and services. Thus, businesses will save the advertising budget by selling directly to the client. Users will get tokens for viewing offers and a personalized tour.

Users may generate information about themselves or their interests by using the TravelChain application. TravelChain will allow users to decide independently how to use that kind of information: when and which application to provide access to and receive remuneration for it. Users will be able to rate and write reviews and get acquainted with the travel experiences of other users, make deals, consider various options for tours, accommodation, entertainment and transportation, and much more. The main users of the TravelChain platform are:

- Users / companies (consumers of services and information, service and information providers);
- Services (information intermediaries between buyers and sellers);
- Technical observers (delegates). These are elected by TravelToken holders on the basis of delegative democracy and further they are responsible for monitoring the TravelChain software performance;
- Economic observers (committee). They control the economic parameters of the blockchain without changing the program code.

Travel Token is fuel for smart travel ecosystems. By using tokens, companies can receive processed data from an AI service; by transferring Travel Token as payment, users can share data with other TravelChain members who use web services or applications, thus they receive Travel Token in return; services can use Travel Token and exchange data between themselves using access keys.

The system works in the following way from a business point of view: the owner of a hotel or a restaurant chain wants to attract new customers. Cooperation with a marketing agency and expensive billboards in the city centre yield very little result. The owner of a hotel or a restaurant pays for an access to the TravelChain database and analyses the inquiry market. The information is essential; moreover, you can trace a certain demand for the specialties that your place is famous for. The owner sends a request for personal information of potential customers, who have shown preferences for that particular product in their accounts, pays with Travel Tokens, and thus further communicates with a customer who is interested in restaurant's offers. As a result, owners are enjoying new customers, while customers are taking pleasure of delicious food, good service and new tokens on their balance sheet.

ICO runs on its own blockchain, and the tokens that users buy, go immediately to the wallet. The website Mapala.net, which is a travel blog with users who are encouraged by tokens, has been created on the basis of Steemit and Golos blockchains. In the future, the TravelChain plans to integrate Mapala.net to its blockchain. Mapala will work with three blockchains including TravelChain. Users will get Golos and Steem tokens for blog articles, and TravelToken tokens for disclosing information about themselves.

5 Conclusions

All in all, it appears that blockchain technology can be used not only for cryptocurrency ‘wallets’ but also for many other tasks as its contents of single ‘block’ database is hard to counterfeit (Morkunas et al. 2019). Both the governments and corporations can use blockchain technology to organize work in a more efficient way and gain confidence. With the blockchain, multinational corporations will be able to bargain transparently, record and demonstrate the results instantly and publicly, without delays and understatements.

Thus, the availability of such a tool will allow us to automate many business tasks. This automatization is economically efficient, as it helps eliminate transaction costs: in such a case, banks, notary offices, cadastral systems and other intermediary structures are optional.

However, the blockchain can act not only as an assistant, but also as a substitute for corporations. The blockchain itself is a collective, and non-authoritarian technology. This is a new approach to maintaining databases, registries and registers, and it is fundamentally different from what modern corporations are based on. All in all, there is no hierarchy and all parties involved are equal in blockchain which makes it particularly useful for tourism-related services.

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