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UNDERSTANDING BLOCKCHAIN WITHIN THE TRAVEL INDUSTRY: THE FUNDAMENTALS

Blockchain

a buzzword that has been around the corner for some years now. A technology that might seem confusing and a complicated subject at first, though, once you understand it, everything just flows smoothly.

So, what's the excitement all about?
Let's dive in!

First things first, what is Blockchain Technology?

A technology that carries the potential of dramatically changing the way data is stored and used, improving transparency and security while simultaneously enhancing transactions.

If we had to break it down - Blockchain is a list of public records, also referred to as a publicledger, where deals between parties are registered or stored. Each record, known as a 'block' inside Blockchain terminology, is secured using cryptography.

Blockchain is undeniably an ingenious invention, and by enabling digital information to be distributed but not copied, it designed the backbone of a new type of internet.

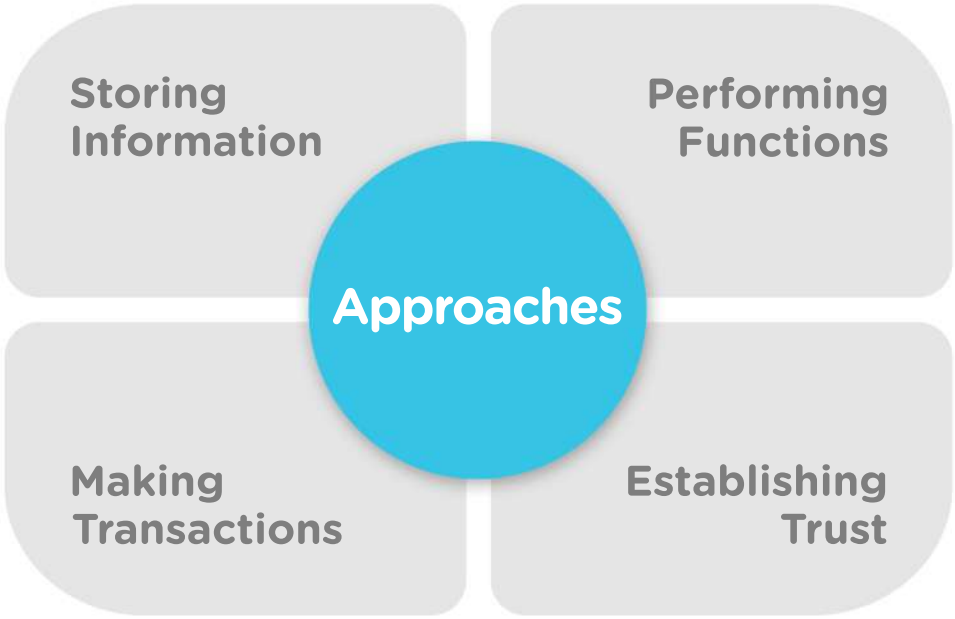
And, where did it come from?

Blockchain technology made its debut in 2008, to serve the purpose of a public transaction ledger for the cryptocurrency - bitcoin. It became the first-ever invention of digital currency that resembled the real world cash system and solved the issue of double-spending without the need of a presumed authority or central server.

The decentralized, time-stamped, permanent, and resolute nature of data registered in the Blockchain means that data is more secure, verifiable and transparent. Besides, there is no focal point of failure, and the information itself is repellent to modification and unwanted tampering.

The Basics of This New Digital Trend

A finished product of decades of study and innovations in cryptography and security, Blockchain offers an entirely different approach for industries with high-security requirements and mutually unknown actors.



Though Blockchain's basis will always be traced back to its links to Cryptocurrency, owing to the points mentioned above, its foundation has so far successfully resisted cyber-attacks for more than eight years now. Thus, some of the largest corporations have put their trust in this technology to solve the pressing security issues of our time. Blockchain's characteristics of being decentralized, time-stamped, and unalterable, and without any central point of vulnerability makes the technology more reliable, transparent, and traceable.

The Working

Before understanding the processes, let's have a look at the components included in its functioning:-

- **Node** - a user or computer within the Blockchain architecture
- **Transaction** - the smallest building block of a Blockchain
- **Block** - a data arrangement used for keeping a set of transactions allocated to all nodes in the network
- **Chain** - a series of blocks in a particular order
- **Miners** - specific nodes which initiate and undertake the block verification process before adding anything to the Blockchain structure
- **Consensus** - a set of rules and methods to carry out Blockchain operations

Steps:

1. One party requests a transaction.
2. The requested transaction is represented as a block and funneled into a P2P network and broadcasted to every party in the network.
3. Individual nodes receive the request and validate the transaction using an algorithm.
4. The nodes approved transactions are then represented as blocks and are added to a public ledger.
5. Once the blocks are added to the chain, the transaction is complete and permanent.

What makes Blockchain technology immutable and secure is allowing two participants to partake in a secure digital transaction without any interruption of a third party. Blockchain being a ledger, records all the operations in an encrypted method, only to protect participants from cybercriminals.

To breakdown its working in an easier manner, some experts also like to compare it with Google Documents working method, as in the days of tossing over the documents and waiting for other participants to make required edits. With Google Documents in regular use now, people can work on the same material simultaneously.

Likewise, the Blockchain methodology enables digital information to be shared than copied, thereby bringing more transparency, trust, and data security.

Blockchain & the Travel Industry

In the digital era, the customer's experience is highly valued because they help develop brand affinity and loyalty. As customers move across the travel value chain, they leave a trail of complex commercial transactions between traditionally unconnected players. Payments and settlements in the travel industry continue to be challenging despite the introduction of automation. Operational challenges like a complex distribution system, frequent cancellation, refunds and disconnected customer touch points are some of the major roadblocks.

Blockchain's trust model for travel industry:

- **Transparency:** Travel industry's exclusive benefits and services have led to exacerbated issues with transparency. Blockchain brings assurance by facilitating a clear and seamless channel of secure transactions for travel markets. By developing and initiating transparent methods and transactions through Blockchain technology, a significant level of trust and belief could prevail in online travel platforms.
  Example: Loyalty points accrual and processing of ticket penalties
- **Immutability:** The capability of a Blockchain ledger provides integrity, both in its technical and primary definition. Its ability to retain permanent and unalterable history of transactions helps stakeholders prove that the information presented and used has not been tampered with, while concurrently modifying the audit process into a more efficient, practical, and cost-effective procedure.
  Example: Billing and settling payments
- **Cryptographic Security:** Blockchain ensures security through a variety of devices that cover advanced cryptographic techniques and analytical models of practice and decision-making. This technology is the underlying formation of most cryptocurrency systems and is what prevents the digital money from being counterfeited or destroyed. In this context, cryptographic hashing functions are of primary interest. Hashing is a process of how an algorithm accepts an input of data of any size and delivers an output that includes aforeseen and fixed size (or length).
  Example: Processing card payments through Blockchain cryptographic hash to prevent fraud and use of cryptographic signature for check-in and baggage reconciliation
- **Data Integrity:** It's of utmost importance for the travel industry that it adheres to the government's set rules and regulations of maintaining data integrity. Blockchain as a new addition to it might be the best solution to enhance data integrity to the highest standards. This technology has been designed in a manner that resists any modification/s to data and acts as a timekeeping device for data structure, so evidence of history of data is easily reportable and refreshed to the second.
  Example: Ticket reports and Flight Trimsheets
- **Decentralized Processing:** Having a single database in place of a local private database that is used by several institutions and banks with complicated and inefficient processes for reconciling leads to ample difficulties. Blockchain technology's decentralized character ensures a zero probability of system failure. It can tolerate any accidental faults in the system while any attack aimed at disestablishing the system will have a minimal or null effect on it.
  Example: Fare rules and fare filings

The Potential & Benefits

A brief understanding of the basics of blockchain technology helps in analyzing all the potential applications, from guarantee and distribution of inventory to traveler identity, and security of payments to ticketing within the travel industry. As this industry highly relies on various organizations for required information; Blockchain makes storing important information more accessible and reliable because the duty for collecting it is shared across the whole network. For an industry as fragmented as travel, Blockchain-based settings are already confining significant pain points and working to determine and fix common challenges by concentrating on streamlining methods and building a more equitable ecosystem that dodges gatekeepers. The technology's force is more than hypothetical, with several new businesses emerging to disrupt various nodes on the industry's supply chain. Let's look at some aspects of its usage.

Tracking Baggage: Although airlines are continually trying to introduce more innovative services in flight, passengers are still unable to have a full picture of their luggage. Lost baggage is a big issue for customers and airline companies. The source of the problem is the fact that multiple different parties handle bags as they are transported from A to B, including airline, airport, security and ground staff. Blockchain technology can be remarkably valuable for tracing and tracking the movement of baggage, particularly when managing international travel. Using a decentralized database makes sharing and monitoring information between organizations a lot simpler. A collaborative and distributed ledger used by all parties within a network of airports would allow a bag and its ownership details to be automatically logged on a Blockchain. Different parties can then track baggage, rather than reconcile between silo's databases. Not only that, any liability and reimbursement for lost baggage could be easily identified and automated using a smart contract. This would establish and ease the exchange of baggage data records shared among various parties and make it much more convenient to track bags as they move with a traveler during a journey.

- **Identification Services:** One of the essential services in the travel industry is identification service, and Blockchain can become the industry standard for identifying and storing data. The highly reliable and immutable nature of Blockchain makes it ideal for enhancing the way travelers are identified throughout their journey. This technology can reduce check-in times, or queues in air terminals, as a mere retina scan or necessary fingerprint scan can take over recording documents at any point of time. In a Blockchain network, individual travelers could be tracked throughout their journey, with different parties seamlessly confirming that verified individuals were making their journey in the correct way. From the passenger's point of view, this will make the journey easier but also without intruding on their privacy. Zero-knowledge proofs would allow passport and other documentation to be verified by various service providers, without needing to share sensitive information.
- **Loyalty Schemes:** whether for air miles, hotel stays or anything else, already play a big role within the travel industry. However, customers often find them to be too restrictive and limited to a small set of rewards. Digital tokens provide an excellent opportunity to enhance the transparency, security and exchangeability of these rewards. It will improve the customer's experience when using them.

  By tokenising reward programmes and transforming them into a decentralised network of value, these schemes could become what customers really want them to be. Firstly, they could expose a range of products and services from different providers. Secondly, rewards could be easily exchanged between schemes if points are tokenised into digital assets. As a result, customers would be able to compare the relative value of schemes and the rewards that they offer.
- **Decentralized Booking Marketplaces:** Anyone who has booked online travel knows, the market is dominated by a handful of online travel agencies (OTAs). Even though these middlemen

help customers find the services they want, end providers, such as hotels, disfavor the fact that they are paying at least 15% in commission through these channels.

In a decentralized booking marketplace with the service providers directly connected to the customers, these entities seem unnecessary. Further more, the transparency of prices within the marketplace can provide a better experience for the customers.

- **Secure Payments:** One principal advantage with this technology is that payments with digital currency will be considerably more traceable and secure. Moreover, all transactions made on Blockchain stay registered on the chain and cannot be modified. Blockchain applications can serve as a universal ledger, making bank payments more secure and manageable by allowing organizations to accept payments utilizing Bitcoin and other digital currencies.
- **Travel Insurance:** Blockchain technology proves to be very efficient when it comes to insurance, especially when the requirement is of high-quality data for quick contracts to automate decisions reliant on this information. If you think of any number of situations where a claim against a travel insurance policy might become inevitable, such as a lost bag or a delayed flight, a smart contract using data oracles within a decentralized network could spot whether the claim's thresholds had been met, and payout can happen automatically.
- **Inventory Management for Higher Visibility:** Meagre visibility on the inventory usually leads to overbooking, cancellations and refunds. In a Blockchain, each settled booking, be it a direct sale or a booking made by an agent, will be added as a trade block. All participants will thus have a consolidated view of the outstanding inventory. It can also benefit airlines and hotels to monitor the fill rate.
- **Maintenance, Repair & Overhaul:** A collaborative digital ledger can be shared by airlines, Maintenance, Repair and Overhaul (MRO) teams and Original Equipment Manufacturers (OEMs) to read flight operations, conditions and scheduled aircraft maintenance checks. It can also improve the forecast when repairs should be made. Payments for parts or services will not be subject to delays. Blockchain can also help assess the average stopover and based on the average traffic handled by the Air Traffic Control Center, the standard take-off time can be calculated, thus providing all players accurate runway data.

Blockchain empowering travel during COVID-19

The pandemic has severely affected traditional models of the travel industry and exposed unforeseen gaps in their processes. Blockchain will be vital in the recovery process of the industry by opening immutable and transparent channels for all the concerned parties remotely and securely. Travelers will need to have their trust restored in safety of airlines. Countering these doubts would require transparent and faithful processes that ensures social distancing norms and reduces unreliable touch-points.

Enabling self-service: By implementing clear and reliable channels across all the participating nodes, real-time information such as seat availability, pricing and schedules can be accessible to all concerned parties. The immutable nature of blockchain ledgers further enables digital payment as it provides unalterable proof of transactions. The end-to-end process from viewing flights to purchasing tickets can thus be made contactless and airlines can begin their journey torecovery.

Bolstering social distancing: Blockchain can meaningfully reduce the queues inside airports and during check-ins, condensing them to simple fingerprint or retina scans. The technology removes any hazardous touch-points from the travel experience, enabling a seamless and safe passage for all travelers.

Is The Industry Ready?

After looking into all the important insights from blockchain fundamentals within the travel industry, where security remains a paramount factor, this technology can offer the best of stability and protection.

The industry seems so ready for blockchain disruption because of the range of go-betweens and service providers that connect to make a complicated web of synergies in a traveler's journey. Having said that, set players within the market have already embraced the technology so they might not find themselves disrupted by it. However, true broad-based adoption might still be faraway.

Sources

- https://www.travelport.com/sites/default/files/travelport-blockchain-whitepaper.pdf
- https://www.revfine.com/blockchain-technology-travel-industry/
- https://www.canadiantraveller.net/Blockchain-and-the-travel-industry-What-you-need-to-know
- https://www.wns.com/insights/articles/articledetail/509/article--blockchain-in-travel-a-compelling-case-for-adoption
- https://www.academia.edu/40821417/Blockchain_Technology_in_Tourism_Applications_and_Possibilities
- https://blockgeeks.com/guides/what-is-blockchain-technology/
- https://www.cryptonewsz.com/how-travel-industry-can-benefit-from-blockchain-technology/54964/
- https://cio.economictimes.indiatimes.com/news/strategy-and-management/getting-back-up-how-blockchain-can-help-reopen-borders-post-covid-19/76332560