

# The Urgency Of Blockchain In Developing The Tourism Industry In Indonesia

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## ABSTRACT

*This study is a qualitative study with a descriptive approach. It relies on descriptive text to express this article's primary intent and purpose by first describing the main topics, including Blockchain, the Tourism Industry, and its development through Blockchain. The data used in this study are primary data that researchers obtain from various credible sources such as books, scientific magazines, scientific articles, and other sources, which are usually used in each study. The data obtained are analyzed using the stages of data collection, reduction, selection, and conclusion. The result in this article shows that Blockchain can develop the tourism industry in Indonesia through the ease of booking tickets and finding tourist locations, security of tourist data, both foreign and local, tourism marketing, ease of tourism payments, and so on, which aim to develop the tourism industry in Indonesia.*

**Keywords:** Blockchain Technology, Digital Transformation, Tourism Industry, Indonesia

## Introduction

Blockchain is a decentralized electronic ledger system that creates a secure and permanent cryptographic record of every value transaction, whether money, goods, property, etc. In simple terms, Blockchain is a distributed database to record transactions and share them with those people. [1] Every transaction must be governed by the consensus agreed upon in the database network to minimize fraud. Blockchain provides easy access safely, transparently, and without complicated and expensive procedures, making it more effective and efficient. [2].

Blockchain has undergone rapid evolution to date. Blockchain development has reached four phases. [3] 1) Blockchain Phase 1.0. This phase begins the emergence of Blockchain as a milestone for digital currency. Technology in this phase appears as a behind-the-scenes actor. Examples of the Blockchain 1.0 phase include mining technology platforms, hashing, and general ledgers. The advantages of using Blockchain 1.0 are low transaction costs for online purchases, better anatomical offers than credit cards, and protection from inflation. 2) Blockchain Phase 2.0. This phase is a form of development in the digital economy [4]. In this phase, there is a revolution in finance with various financial applications that provide convenience, such as payments, transfers, and conducting business transactions. The Blockchain 2.0 phase gives rise to smart contracts, which are programs to ensure mutual agreements following regulations or agreements in the database network. 3) Blockchain Phase 3.0 This phase evolves from the digital economy to the digital society. In this phase, those involved are from the business world and various fields such as health, education, government, communication, science, and others. 4) Blockchain X.0 Blockchain generation X is the final stage of Blockchain. One day, we will have a public Blockchain service that anyone, such as the Google search engine, can use. This generation has used artificial intelligence and has applied it to all sectors of people's lives.

Types of Blockchain are divided into three parts, namely [5]: 1) Public Blockchain, namely Blockchain that is widely distributed and works using native tokens. The type of public Blockchain allows everyone to contribute to maintaining it, so it is said to be open source. 2) Permissive Blockchain, namely, Blockchain, provides conditions for developers to develop the Blockchain network system. The source code provided can be open or closed. 3)

Private Blockchain, namely Blockchain with a small use scale, and does not require native tokens. In a private Blockchain, there is only one person who is responsible for maintaining essential things so that they can give mining rights to anyone or even not give them to anyone at all [6].

The building structure of the Blockchain system consists of 3 main parts, namely. [7](1) Block (Block) Blockchain consists of many blocks representing a list of valid and stored transactions. Each block has a cryptographic hash as a pointer or identity for each block, so that the blocks can be connected. The block structure comprises a header, metadata, and a list of stored transactions. Below is an explanation of the components in each block of the Blockchain network: a) Block Size is the first part of the block structure that stores information about the block size in bytes. b) Block Header is a part of the block that is 80 bytes in size and stores a combination of metadata, such as [8](1) Version: Stores version information for one block and is 4 bytes in size. (2) Previous Block Hash: Metadata that stores the previous block's hash also acts as a "chain" that connects the block to the previous block and is 32 bytes in size. (3) Merkle Root: Is a compilation of information from all transactions that are hashed on a block with a size of 32 bytes, and its purpose is to provide conclusions about all transactions made by the block. (4) Timestamp: Stores information about the timestamp or when the block was created and is 4 bytes in size. (5) Difficulty Target: Stores information about the difficulty of the PoW (Proof of Work) algorithm used and is 4 bytes in size. (6) Nonce: A random number stored with a size of 4 bytes is used when mining a new block. c) Record is a part of the block that counts how many transactions have been made and is usually 1-9 bytes in size. d) The Transaction List is a part that stores data from transactions made in blocks of different data sizes. 2) Chain. For each block on the Blockchain to be connected, a "chain" in the form of a hash is needed to connect one block to another. The hash mechanism is one of the complex mathematical concepts applied to Blockchain. Although Blockchain is considered the latest technological innovation [9].

But not with hash. The concept of hash has been around for about 30 years and is used in the Blockchain concept, because a hash can only create a one-way function that cannot be cracked (in the description) [10]. The hash function creates a mathematical algorithm that maps data of all sizes into character bits, usually around 32 characters long, where the length of the bit size represents the data being processed or hashed. Secure Hash Algorithm (SHA) is one of the hash functions used in Blockchain. In contrast, the algorithm commonly used for Blockchain hashing uses the SHA256 algorithm, which converts data of various sizes into 256-bit hash characters. (32 bytes), So, in Blockchain, a hash can be considered a unique data fingerprint in one block to keep the block sequential. 3) Network The term network or network in Blockchain represents the number of nodes or computers connected and running an algorithm to secure the network. Each node has a record of all transactions recorded in the Blockchain. These nodes are located worldwide and are managed by everyone in the Blockchain network. This is very clearly related to the network topology used by Blockchain, namely Peer-to-Peer, where all nodes can communicate with one another to receive and send messages [11].

There are five basic principles of the Blockchain system, explained as follows.[12] [13]1) Distributed Database: A large replicated ledger is identical to the database. Each participant in the Blockchain has access to the entire database, and no single participant acts as a data controller. Data from partners can be verified directly without a third party as an intermediary. 2) Peer-to-Peer Transmission Communication between colleagues or members in the Blockchain system is carried out directly without a coordination center or third party. 3) Transparency with Pseudonymity Transactions between Blockchain addresses are visible to anyone with system access. When a change is entered in one copy of another, that is updated simultaneously. Users in the Blockchain have a unique alphanumeric address that identifies them. Users can remain anonymous or provide proof of their identity to others. 4) Irreversibility of Records Once a transaction is entered into the database, the record cannot be changed. Various computerized algorithms are deployed to ensure that the records in the database are permanent and available to everyone on the network. 5) Computation Logic The digital system in the ledger means that users can set algorithms and rules that automatically trigger transactions between nodes [14].

Each block on the Blockchain contains some data or information. [15]. The data stored in the block depends on the type of Blockchain used. For example, the Bitcoin Blockchain stores transaction details, such as sender, recipient, and number of coins. A block also has a hash, which has almost the same use as a fingerprint. Hash identifies the block and all its contents and is always unique, like a fingerprint. When a block is added to the network, its hash will be calculated/created immediately. Changing something in the block will cause the hash to change. So, in other words, hash is handy when you want to detect changes in the block. If the fingerprint of a block changes, then the block is no longer the same. [16].

The description of the Blockchain system mechanism is obtained by understanding the set of nodes (clients) that operate in the Blockchain, including [17]: 1) Users interact with each other through a pair of public and private keys, which are used to mark their transactions. 2) Neighboring peers ensure that the transaction is valid before replying. If there is an invalid transaction, it cannot be verified. 3) Valid transactions that the network has collected through the above process will be agreed upon, sorted, and packaged into timestamped candidate blocks. This process is called mining. 4) Furthermore, other nodes will verify the suggested block, namely: (1) The transaction that occurs is valid, (2) refers to the previous block hash of the correct chain. Blockchain is a collection of authors who do not trust each other, a database that does not have a trusted intermediary. There needs to be an

implementation of a set of rules that all network members on the Blockchain will obey. Based on the method of use and advantages of using Blockchain above, researchers believe Blockchain is very useful in developing tourism in Indonesia [18].

## Research Method

The explanation in the introduction above shows that this study aims to analyze the urgency of Blockchain in developing the tourism industry in Indonesia. [19]. This study is a qualitative study with a descriptive approach. It relies on descriptive text to express this article's primary intent and purpose by first describing the main topics, including Blockchain, the Tourism Industry, and its development through Blockchain. [20]. The data used in this study are primary data that researchers obtain from various credible sources such as books, scientific magazines, scientific articles, and other sources, which are usually used in each study. [21]. The data obtained are analyzed with the stages of data collection, data reduction, data selection, and concluding with a more complete explanation below. [22].

## Result and Discussion

### Blockchain

Blockchain is a decentralized electronic ledger system that creates a secure and permanent cryptographic record of every value transaction, whether money, goods, property, etc. In simple terms, Blockchain is a distributed database to record transactions and share them with those people. [1] Every transaction must be made by consensus agreed upon in the database network to minimize fraud. Blockchain provides easy access, safety, and transparency without complicated and expensive procedures, making it more effective and efficient. [2].

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### **The Urgency Of Blockchain In Developing The Tourism Industry In Indonesia**

Blockchain has the potential to revolutionize the tourism industry. The technology offers several benefits, including. [23]1) Greater transparency: Blockchain records all transactions transparently and verifiably, minimizing fraud and building trust between tourism businesses and tourists. 2) Enhanced security: Data stored on Blockchain is encrypted and distributed across multiple computers, making it difficult to hack or tamper with. 3) Greater efficiency: Blockchain can automate processes such as bookings, payments, and inventory management, saving time and money for tourism businesses. Like any new technology, Blockchain also faces several challenges, such as [24]1). Scalability: Blockchain can be slow and expensive to process large transactions. 2) Regulation: The tourism industry is governed by complex regulations, and Blockchain must comply with these regulations to be widely adopted. However, these challenges also allow tourism businesses to innovate and develop new solutions. By effectively leveraging Blockchain, the tourism industry can increase transparency, security, and efficiency while opening up new opportunities for growth and profitability.

Blockchain is a distributed ledger technology that records transactions securely and immutably. In the context of tourism, this allows travelers to track and verify their bookings easily. Every transaction related to a travel booking, from reservation to payment, is recorded on the blockchain, providing a transparent and tamper-proof record. With transparency guaranteed, travelers can feel more confident about their bookings, as they can track their status in real-time. [25]. This dramatically reduces the risk of fraud and errors, providing travelers peace of mind and enhancing travel providers' reputation. [26].

Based on the explanation above, it can be concluded that Blockchain can develop the tourism industry in Indonesia through the ease of booking tickets and finding tourist locations, security of tourist data both foreign and local, tourism marketing, ease of tourism payments, and so on which aim to develop the tourism industry in Indonesia.

## Conclusion

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