



## Blockchain Technology for Employee Verification and Background Checks in the Human Resources Recruitment Process

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### ABSTRACT

Blockchain technology offers an innovative solution for employee verification and background checks in the human resources (HR) recruitment process. This research aims to explore the application of blockchain technology in employee verification and background checks in the human resource (HR) recruitment process through prototype development and evaluation. This research methodology uses a qualitative approach with a focus on prototype design and testing.

With a decentralised and transparent system, blockchain can reduce costs, increase trust, and protect personal data. The results show that the adoption of blockchain in recruitment can optimise operational efficiency and minimise the risk of data fraud.

## INTRODUCTION

The recruitment process in human resources (HR) often faces various challenges, especially in terms of employee verification and background checks (Alfarizi Ramadhan, 2021). Conventional methods often involve time-consuming procedures, high costs, and the risk of inaccurate data and fraud. These inefficiencies not only slow down the hiring process but also pose significant risks to organizational integrity and security.

Blockchain technology, known for its decentralization, transparency, and security, offers a promising solution to these challenges. Originally designed for financial transactions, blockchain capabilities have expanded to various fields, including HR, where this technology can revolutionize the way employee data verification in the recruitment process is carried out (Chandrasekeran et al., 2023).

The conceptualization of blockchain technology was founded by someone named Satoshi Nakamoto in 2008 (Nakamoto, 2008). when he published a paper on Bitcoin. Blockchain technology is a systematic data storage method Systematic storage of data that makes it difficult to change or steal data from the system.

The implementation of blockchain in employee verification allows companies to perform real-time credential checks, reducing dependence on third parties. Each data entry, such as educational certificates, work experience, and criminal records, can be validated and stored in the blockchain, ensuring the integrity and validity of the information (Ahmed & MacCarthy, 2022). In addition, the transparency provided by blockchain allows for an easier and more accurate audit process, as well as increasing trust between the company and employees (Aziz Perdana, Erik Iman HU, & Rianto, 2023)

Blockchain consists of blocks that are interconnected. The blocks are responsible for storing information. In a blockchain, each block contains a hash value, timestamp, and transaction information. The hash value indicates the previous block. Because hashes are generated automatically, changing any information they contain is impossible. During this time, each subsequent block improves the verification and validation of the previous block and makes it secure for all blockchains (Nesarani, Ramar, & Pandian, 2020). Blockchain can be classified into several types, namely public, private, and hybrid (Damle, Kulkarni, & Damle, 2023).

The benefits of implementing blockchain technology in the recruitment process include reducing operational costs, increasing verification speed, and mitigating the risk of data fraud (Damle et al., 2023). Additionally, employee data security can be significantly improved as blockchain provides a virtually unhackable system (Meharwal et al., 2022). In this way, companies can ensure that sensitive data remains protected from unauthorized access

This article will outline the specific mechanisms of applying blockchain in employee verification and background checks, and evaluate the benefits and challenges faced. Through this study, it is hoped that it can provide comprehensive insight into how blockchain technology can change and improve the HR recruitment process, as well as encourage the adoption of this technology to achieve higher efficiency and security in human resource management.

## **LITERATURE REVIEW**

Blockchain technology has attracted the attention of various industries due to its transformational potential in improving efficiency, security and transparency. In the context of human resources (HR), blockchain offers innovative solutions to a variety of challenges, including employee verification and background checks. This section will review existing literature regarding the application of blockchain in HR, with a focus on employee verification and background checks.

### ***Blockchain Concept and Characteristics***

Blockchain is a distributed ledger system that allows transactions to be recorded securely and transparently without the need for a central authority. Each transaction is recorded in blocks that are cryptographically linked in an immutable chain (Nakamoto, 2008). The main characteristics of blockchain, such as decentralization, transparency, and security make it an ideal technology for applications that require high data integrity (Yaga, Mell, Roby, & Scarfone, 2019)

### ***Blockchain in Employee Verification***

One of the main applications of blockchain in HR is employee verification. Blockchain can be used to store and verify employee credentials, such as educational certificates, work experience, and criminal records. With blockchain, companies can reduce dependence on third parties for data verification, which is often slow and expensive (Guo, 2008). In addition, blockchain ensures that stored data cannot be changed, thereby increasing trust in the information presented (Tandon, Kaur, Mäntymäki, & Dhir, 2021)

### ***Benefits of Blockchain in Background Checks***

Effective and accurate background checks are essential to ensure that employees hired have appropriate credentials. Blockchain can increase the efficiency of background checks by providing real-time access to verified data, reducing the time required to process such checks (Rhemanda, Simbolon, & Fachrunnisa, 2021). In addition, the transparency provided by blockchain allows related parties to carry out audits more easily and ensure that the information obtained is correct and not manipulated.

### ***Challenges of Blockchain Implementation in HR***

While the benefits of blockchain in HR are significant, there are several challenges that need to be overcome. One of the main challenges is the need for adequate technological infrastructure to support blockchain implementation. Additionally, regulation and compliance with data privacy are important considerations in blockchain implementation, as sensitive employee data needs to be protected from unauthorized access. Resistance to change from traditional methods can also be a barrier to the adoption of this technology.

### ***Case Studies and Real Implementation***

Several case studies have demonstrated the successful implementation of blockchain in employee verification and background checks. Our proposed system helps HR organizations hire the right people the right candidates quickly for the right positions. Compared with traditional recruitment systems in human resource management, our proposed system is simple and saves a lot of time, and its decentralized features make it highly secure and impossible to hack (Rahman, Fahad Mollik, Hasan, & Akter, 2022). This study shows that with proper planning and execution, blockchain can bring significant positive change.

## **METHODOLOGY**

This research aims to explore the application of blockchain technology in employee verification and background checks in the human resource (HR) recruitment process through prototype development and evaluation. This research methodology uses a qualitative approach with a focus on prototype design and testing.

### ***Research Design***

When an employee is undergoing orientation, most organizations have a background check policy, which verifies the new employee's credentials against what is stated in their Curriculum Vitae. This background check process mainly still follows checks via email, references, work experience and physical location checks to assess the validity of the employee's Curriculum Vitae. By placing schools, colleges, and organizations on a larger Blockchain that communicates with each other, one will have an immutable set of records that will act as a background check against the Curriculum Vitae. Organizations that wish to perform a background check on an employee will contact the administrator organization to obtain the necessary information. Such a process will complete the background verification for an employee and will also ensure fewer problems in cases where the employee has joined the organization and is later found to have questionable results in the background check, resulting in termination of employment or worsening of the relationship on at that time, which resulted in a poor onboarding experience.

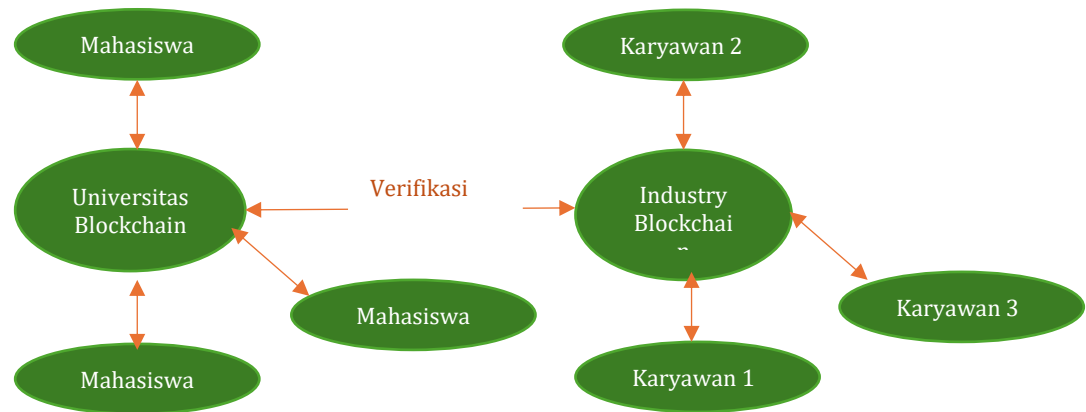


Figure 1. Flow Chart Blockchain employee verification

**a. Verifikasi Blockchain**

The process of ensuring the integrity, authenticity and validity of data or transactions stored on a blockchain. Blockchain technology provides a secure and transparent way to record data that cannot be changed once it is stored, making it a powerful tool for data verification in a variety of contexts, including employee recruitment.

**b. Universitas Blockchain**

Universities that Use Blockchain in Employee Recruitment and Verification Processes. By adopting blockchain technology, universities can ensure that students' academic qualifications are verified quickly and securely, reducing the risk of forgery, and increasing efficiency in the recruitment process.

**c. Industry Blockchain**

Companies Using Blockchain in Employee Recruitment and Verification Processes. Companies can ensure that the employee verification process is faster, safer and more transparent, thereby increasing efficiency and trust in the recruitment process.

**d. Data Employee**

Employee data using blockchain technology is a process that utilizes the security, transparency and efficiency of blockchain to ensure the authenticity and integrity of employee information in recruitment and human resource management.

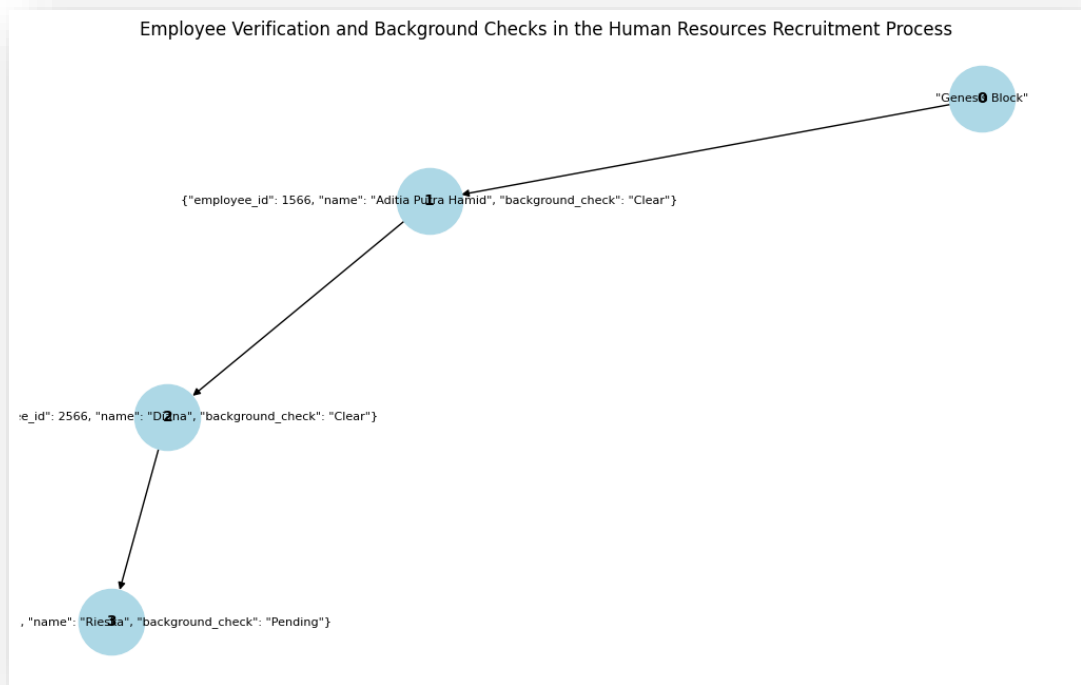
### Proposed Algoritma

The following is an algorithm using the Python programming language that is proposed for verifying employee data using blockchain technology. This algorithm includes the steps of data collection, encryption, storage, verification and use of smart contracts.

```
# Function to verify the integrity of the blockchain
def verify_blockchain(blockchain):
    for i in range(1, len(blockchain)):
        current_block = blockchain[i]
        previous_block = blockchain[i - 1]

        if current_block.hash != calculate_hash(current_block.index, current_block.previous_hash, current_block.timestamp, current_block.data):
            return False
        if current_block.previous_hash != previous_block.hash:
            return False
    return True
```

Gambar 2. Code Verification and Background Check Employee



Gambar 3. Verification and Background Check Employee

## RESULT

This research uses a qualitative method with a case study approach on companies that have implemented blockchain technology to verify employee data. Data was collected through in-depth interviews with HR managers and related staff, as well as document analysis and direct observation of the verification process

The research results show that blockchain technology provides significant benefits in verifying employee data. The enhanced security, transparency and efficiencies gained can reduce the risk of errors and fraud, and increase trust in the recruitment process.

Blockchain technology in employee data verification has proven effective in increasing security, transparency and efficiency. Companies that adopt this technology can expect improvements in trust and operational efficiency, as well as reduced risks associated with manipulation and unauthorized access to employee data. By providing an interface to test smart contracts by entering the required information according to the smart contract. After the transaction, it generates a hash value and stores the information. The output is given below:

```

Blockchain is valid: True
Index: 0
Previous Hash: 0
Timestamp: Sun Jul 28 10:24:51 2024
Data: "Genesis Block"
Hash: 545559d5b1299bef3c87eb8bf24a0de53d27e53bbfdb62037758fa232ef5cdf

Index: 1
Previous Hash: 545559d5b1299bef3c87eb8bf24a0de53d27e53bbfdb62037758fa232ef5cdf
Timestamp: Sun Jul 28 10:24:51 2024
Data: {"employee_id": 1566, "name": "Aditia Putra Hamid", "background_check": "Clear"}
Hash: 8bb4d645e72b443149629ff244f5ce46306e110ec9494846b2daf2092f12d5ee

Index: 2
Previous Hash: 8bb4d645e72b443149629ff244f5ce46306e110ec9494846b2daf2092f12d5ee
Timestamp: Sun Jul 28 10:24:51 2024
Data: {"employee_id": 2566, "name": "Diana", "background_check": "Clear"}
Hash: 8811fd0fdd553c2cdb71fca713cb53b18ad5441671a2cba6859412b353746a47

Index: 3
Previous Hash: 8811fd0fdd553c2cdb71fca713cb53b18ad5441671a2cba6859412b353746a47
Timestamp: Sun Jul 28 10:24:51 2024
Data: {"employee_id": 3678, "name": "Rieska", "background_check": "Pending"}
Hash: 4bdaf20a01a2f9c266daf52ba1399e47ef558aa7b33c3b1c67adec15288eaa6b
    
```

### Actual Data

Previous Hash	Timestamp	Data	Hash
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Gambar 4. Contract Information Blockchain Data

## CONCLUSION

This research evaluates the use of blockchain technology in employee data verification, with a focus on security, transparency, and efficiency. Blockchain technology is a powerful invention for creating decentralized applications, which makes our lives easier and safer. Our proposed system helps HR of an organization recruit the right candidate for the right position by verifying the employee's background. Implementing smart contracts for automatic data verification reduces the time and costs required. Companies report reducing verification times from days to just minutes as well as reducing the need for time- and resource-consuming

manual verification, improving overall operational efficiency.

Blockchain provides a transparent and immutable record of transactions, making the audit and verification process easier. The research results show that blockchain technology provides significant benefits in verifying employee data. The enhanced security, transparency and efficiencies gained can reduce the risk of error and fraud, and increase trust in the recruitment process.

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