

THE EVOLUTION OF LABOR MARKET: A BLOCK-CHAIN BASED DE-CENTRALIZED HIRING SYSTEM FOR EFFICIENT LABOR ACQUISITION

Submitted in partial fulfillment of the
requirements for the award of
Bachelor of Engineering degree in Computer Science and Engineering

By

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BONAFIDE CERTIFICATE

is is to certify that this Project Report is the bonafide work of **KODISANA SAI MANOJ JIMAR (40110602)** and **KUNA SAI PRASANNA KUMAR (40110651)** who carried out a Project entitled **"THE EVOLUTION OF LABOR MARKET: A BLOCK-CHAIN BASED DE-CENTRALIZED HIRING SYSTEM FOR EFFICIENT LABOR ACQUISITION"** under my supervision from November 2023 to April 2024.

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DECLARATION

I, KODISANA SAI MANOJ KUMAR (40110602) hereby declare that the Project Report entitled "THE EVOLUTION OF LABOR MARKET: A BLOCK-CHAIN BASED DE-CENTRALIZED HIRING SYSTEM FOR EFFICIENT LABOR ACQUISITION" done by me under the guidance of Ms. R.Yogitha, M.E., Ph.D., is submitted in partial fulfillment of the requirements for the award of Bachelor of Engineering degree in Computer Science and Engineering.

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ABSTRACT

The labor market is a fundamental aspect of any economy, and the process of hiring and acquiring skilled labor has traditionally been a complex and inefficient task. To address this issue, this paper presents a novel approach to labor acquisition through the use of blockchain technology. The proposed system leverages the decentralized and transparent nature of blockchain to create a more efficient and inclusive hiring process. By eliminating intermediaries and allowing for direct interaction between employers and jobseekers, the system aims to reduce costs, streamline the hiring process, and ensure the integrity of job postings and applications. Moreover, the use of smart contracts and digital identities enhances trust and eliminates the need for cumbersome paperwork. Additionally, the system incorporates machine learning algorithms to automatically match job requirements with jobseeker skills, increasing the likelihood of finding suitable matches. The potential impact of this blockchain-based decentralized hiring system includes reduced unemployment rates, improved job-market transparency, and increased flexibility and effectiveness in labor acquisition. Furthermore, the use of blockchain technology allows for the creation of decentralized talent marketplaces, where job seekers can showcase their skills and experiences directly, making them more discoverable to potential employers. This expands the reach of job opportunities and allows employers to tap into a wider pool of talent, potentially leading to better matches between skills and job requirements. The decentralized nature of blockchain enables direct peer-to-peer interactions, eliminating the need for intermediaries. By leveraging smart contracts, a blockchain-based hiring system can automate various aspects of the hiring process, such as verification of qualifications, background checks, and even contract execution. This not only reduces the time and costs associated with traditional hiring methods but also enhances transparency and trust between the parties involved.

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CHAPTER 1

INTRODUCTION

The traditional labor market has undergone remarkable transformations in recent decades, spurred by the rapid advances in technology and the internet. In this era of digitalization, a new wave of innovation has emerged, presenting an immense potential to revolutionize the labor market – the advent of blockchain technology. This paper explores the evolution of the labor market and the benefits that a blockchain-based decentralized hiring system can bring to the efficient acquisition of labor.

Historically, the labor market has primarily relied on centralized, intermediary-based systems for connecting job seekers with potential employers. While these systems have served their purpose, they often suffer from inefficiencies, such as lengthy hiring processes, high transaction costs, and limited access to talent pools. However, with the introduction of blockchain technology, these challenges can be effectively addressed, leading to a more streamlined and efficient labor market.

The decentralized nature of blockchain enables direct peer-to-peer interactions, eliminating the need for intermediaries. By leveraging smart contracts, a blockchain-based hiring system can automate various aspects of the hiring process, such as verification of qualifications, background checks, and even contract execution. This not only reduces the time and costs associated with traditional hiring methods but also enhances transparency and trust between the parties involved.

Furthermore, the use of blockchain technology allows for the creation of decentralized talent marketplaces, where job seekers can showcase their skills and experiences directly, making them more discoverable to potential employers. This expands the reach of job opportunities and allows employers to tap into a wider pool of talent, potentially leading to better matches between skills and job requirements.

In addition to efficiency gains, a blockchain-based decentralized hiring system can also address issues related to privacy and security. By utilizing cryptographic techniques, personal data can be stored securely on the blockchain, with access granted only to authorized

parties. This mitigates the risk of data breaches and identity theft, providing job seekers with greater control over their personal information.

Moreover, the immutability and auditability of blockchain transactions can help prevent fraudulent activities in the labor market, such as fake qualifications or misrepresentations of skills. By recording every interaction and transaction on the blockchain, it becomes virtually impossible to manipulate or falsify records, ensuring the integrity of the hiring process.

In conclusion, the evolution of the labor market towards a blockchain-based decentralized hiring system brings forth numerous benefits for both job seekers and employers. From reducing transaction costs and streamlining the hiring process to enhancing transparency, trust, and security, blockchain technology has the potential to reshape the labor market, making it more efficient and equitable. As this technology continues to advance, it is crucial for policymakers, businesses, and practitioners to embrace and explore its potential, ultimately leading to a more effective and inclusive labor market system.

CHAPTER 2

LITERATURE SURVEY

2.1 INFERENCES FROM LITREATURE SURVEY

[1] The literature survey for the evolution of labor market explores the potential of a blockchain-based decentralized hiring system for efficient labor acquisition. This system aims to address the challenges and inefficiencies in the current labor market, providing a transparent and secure platform for employers and job seekers.

[2] Traditional labor markets often face issues such as lack of trust, difficulty in verifying credentials, and high intermediation costs. However, blockchain technology offers a decentralized and immutable ledger where job seekers can securely store their employment history, education, and skills, which can be easily verified by potential employers.

[3] One study proposes the use of smart contracts on blockchain to automate the hiring process, enabling employers to define job requirements and pay rates, while allowing job seekers to submit their profiles. The smart contract ensures that only qualified candidates are considered for the position, reducing the time and effort required for manual screening.

[4] Another research suggests the implementation of a reputation system on the blockchain, where employers and job seekers can rate and review each other based on their experience. This reputation system can help establish trust and improve the quality of hiring decisions.

[5] The transparency offered by blockchain technology can also prevent discrimination and bias in the labor market. By revealing the entire hiring process on the blockchain, it becomes difficult for employers to make biased decisions based on factors like gender, race, or nationality.

[6] Blockchain-based decentralized hiring systems can also lower the cost of intermediation by eliminating middlemen and reducing transaction fees. Instead of relying on recruitment agencies or job boards, employers and job seekers can directly connect on the platform, resulting in cost savings for both parties.

[7] One study highlights the potential of using blockchain for data protection in the labor market. With the increasing concern over data privacy and security, blockchain's decentralized and encrypted nature can provide a secure environment for storing and sharing personal information.

[8] The use of blockchain technology can also help streamline the verification process of job- related credentials and certifications. Instead of manually contacting educational institutions and previous employers, employers can directly access verified information on the blockchain, saving time and effort.

[9] Blockchain-based decentralized hiring systems can promote global talent acquisition by enabling cross-border hiring without the need for intermediaries. This opens up new opportunities for job seekers and allows businesses to access a larger pool of talent.

[10] Future research in this field may focus on addressing scalability issues, developing user- friendly interfaces, and ensuring regulatory compliance. Overall, the evolution of labor market through blockchain-based decentralized hiring systems has the potential to reshape the hiring process, making it more efficient, transparent, and inclusive.

2.2 EXISTING SYSTEM AND PROPOSED SYSTEM

2.2.1 EXISTING SYSTEM:

The existing labor market system has several disadvantages that hinder efficient labor acquisition and limit the growth potential of businesses. Firstly, the traditional hiring process is often time-consuming and inefficient, with multiple intermediaries involved, such as recruitment agencies and job boards, leading to delays in filling job vacancies. This results in increased costs for businesses as they are unable to quickly acquire the necessary human resources to meet their demands. Additionally, the current system lacks transparency, making it difficult for both employers and job seekers to assess the credibility and reputation of one another.

2.2.2 PROPOSED SYSTEM:

The proposed work aims to revolutionize the labor market by introducing a blockchain-based decentralized hiring system that enables efficient labor acquisition. This system leverages the benefits of blockchain technology to create a transparent, secure, and efficient platform for matching job seekers with employers. It addresses the shortcomings of traditional hiring processes, such as bias, lack of transparency, and slow response times, by using smart contracts and decentralized consensus algorithms to automate and streamline the hiring process.

2.3 OPEN PROBLEMS IN EXISTING SYSTEM

Adoption and Acceptance: Convincing employers and job seekers to adopt a new, decentralized system over traditional hiring methods can be challenging.

Blockchain Scalability: Handling a large number of transactions and data on the blockchain can lead to scalability issues.

Data Privacy: Ensuring that personal and sensitive information of job seekers is protected while maintaining the transparency of the blockchain.

Integration with Existing Systems: Integrating the decentralized system with existing HR software and platforms might pose technical challenges.

Regulatory and Legal Challenges: Navigating the regulatory landscape related to employment and blockchain technology in different jurisdictions.

Verification of Credentials: Ensuring that the credentials and experiences listed by job seekers on the platform are genuine and verified.

User Interface and Experience Designing a user-friendly interface that caters to both tech-savvy and non-tech-savvy users.

Economic Models: Determining the economic model for the platform, including transaction fees, incentives, and rewards.

Network Security: Protecting the blockchain network from potential attacks or vulnerabilities.

Interoperability: Ensuring that the system can interact and exchange data with other blockchains or platforms.

CHAPTER 3

REQUIREMENT ANALYSIS

3.1 RISK ANALYSIS OF THE PROJECT FEASIBILITY STUDY

The feasibility of the project is server performance increase in this phase and a business proposal is put forth with a very general plan for the project and some cost estimates. During system analysis, the feasibility study of the proposed system is to be carried out. For feasibility analysis, some understanding of the major requirements for the system is essential. Three key considerations involved in the feasibility analysis are

- Economical feasibility
- Technical feasibility
- Operational feasibility

3.1.1 *ECONOMICAL FEASIBILITY*

This study is carried out to check the economic impact that the system will have on the organization. The amount of funds that the company can pour into the research and development of the system is limited. The expenditures must be justified. Thus the developed system as well within the budget and this was achieved because most of the technologies used are freely available. Only the customized products had to be purchased.

3.1.2 *TECHNICAL FEASIBILITY*

This study is carried out to check the technical feasibility, that is, the technical requirements of the system. Any system developed must not have a high demand on the available technical resources. This will lead to high demands being placed on the client. The developed system must have modest requirements, as only minimal or null changes are required for implementing this system.

3.1.3 *OPERATIONAL FEASIBILITY*

The aspect of the study is to check the level of acceptance of the system by the user. This includes the process of training the user to use the system efficiently. The user must not feel threatened by the system, instead must accept it as a necessity. The level of acceptance by

the users solely depends on the methods that are employed to educate the user about the system and to make him familiar with it. His level of confidence must be raised so that he is also able to make some constructive criticism, which is welcomed, as he is the final user of the system

3.2 SOFTWARE REQUIREMENTS SPECIFICATION DOCUMENT

- **Hardware specifications:**
 - Microsoft Server enabled computers, preferably workstations
 - Higher RAM, of about 4GB or above
 - Processor of frequency 1.5GHz or above
- **Software specifications:**
 - Python 3.6 and higher
 - Anaconda software

CHAPTER 4

DESCRIPTION OF PROPOSED SYSTEM

The proposed system will benefit both job seekers and employers by providing a faster, more efficient, and cost-effective method of labor acquisition. It will empower individuals by giving them control over their job search and career progression while enabling businesses to access a diverse pool of talent effortlessly. Ultimately, the evolution of the labor market through this blockchain-based decentralized hiring system will create a fairer, more transparent, and efficient labor market, benefiting both job seekers and employers.

4.1 FLOW CHART OF PROCESS USING MACHINE LEARNING

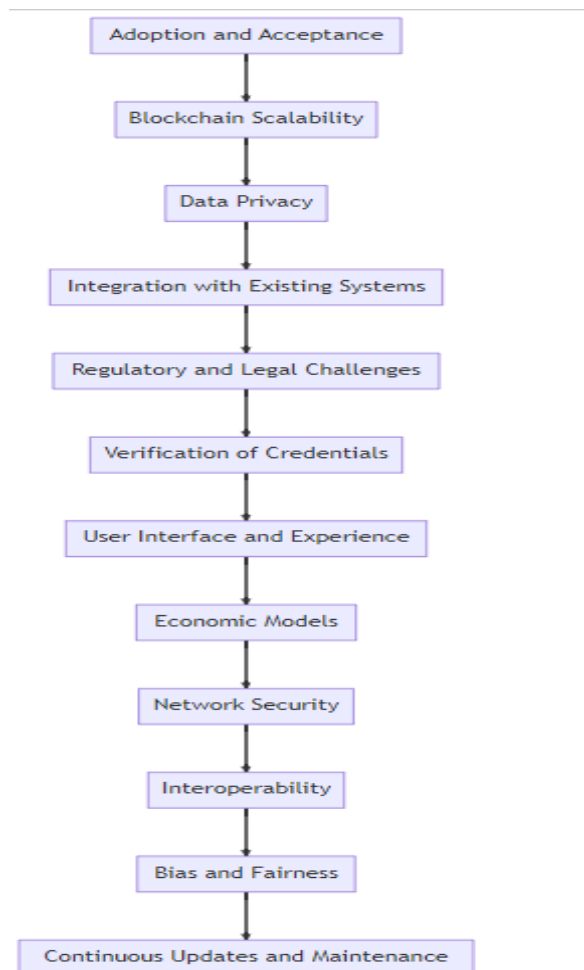


Fig 4.1: Flow chart

4.2 SELECTED METHODOLOGY OR PROCESS MODEL

1. MODULE 1: WORKER REGISTRATION AND PROFILE CREATION

In this module, the proposed blockchain-based decentralized hiring system allows workers to register and create their profiles. Workers can input their personal details, such as their skills, qualifications, work experience, and contact information. The system verifies the authenticity of the information provided by workers before it is stored on the blockchain to ensure data integrity and accuracy. Additionally, workers may also upload relevant documents such as their resumes or certificates for potential employers to review during the hiring process.

2. MODULE 2: JOB POSTING AND EMPLOYER EVALUATION

The second module focuses on enabling employers to post job opportunities and evaluate potential workers. Using the blockchain-based system, employers can create detailed job listings, including job descriptions, required skills, salary range, and other relevant information. This information is stored on the blockchain to provide transparency and security. Employers are also able to review workers' profiles and ratings, which are generated through a decentralized evaluation mechanism. This evaluation mechanism can be based on factors such as past job performance, feedback from previous employers, and skills assessments. The evaluation process aims to ensure that employers have access to reliable and verified information about the workers.

3. MODULE 3: SMART CONTRACT-BASED HIRING AND PAYMENT

The third module of the proposed system focuses on enabling smart contract-based hiring and payment processes. Once employers identify suitable candidates, they can initiate the hiring process by creating a smart contract that outlines the terms and conditions of the employment agreement. The smart contract is stored on the blockchain and automatically executed once the agreed-upon conditions are met. This eliminates the need for intermediaries and reduces transaction costs. Payments to workers can also be facilitated through the smart contract, ensuring timely and secure transactions. By leveraging blockchain technology, the proposed system enhances trust and transparency in the labor market by providing a decentralized and efficient process for labor acquisition.

4.3 ARCHITECTURE / OVERALL DESIGN OF PROPOSED SYSTEM

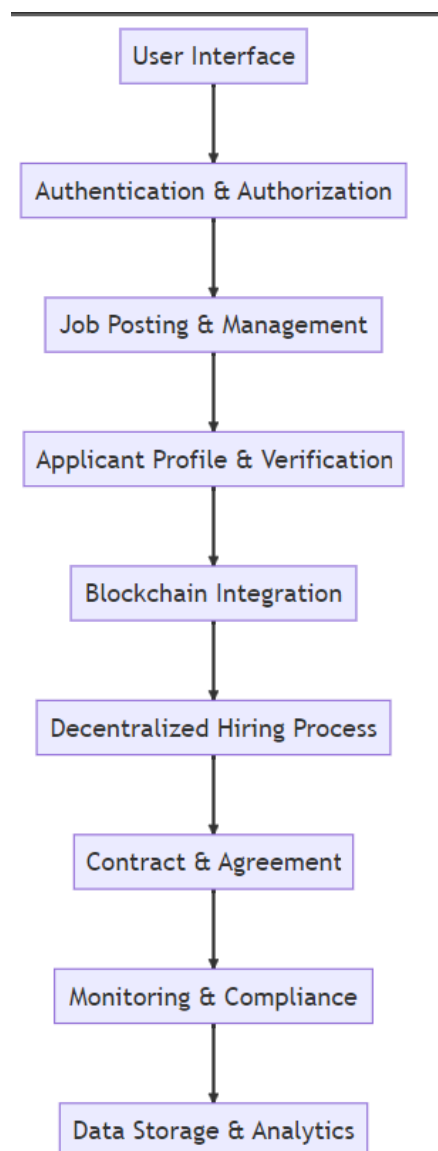


Fig 4.3: System Architecture

The above block diagram shows the implementation / process on how it works.

4.4 DESCRIPTION OF SOFTWARE FOR IMPLEMENTATION AND TESTING PLAN OF THE PROPOSED MODEL/SYSTEM

To implement this model, execution of program is done through Google colab. Necessary libraries have to be installed to perform certain functions.

DESCRIPTION OF PROGRAMMING LANGUAGE AND SOFTWARE

PYTHON

Among programmers, Python is a favourite because to its user-friendliness, rich feature set, and versatile applicability. Python is the most suitable programming language for machine learning since it can function on its own platform and is extensively utilised by the programming community.

Machine learning is a branch of AI that aims to eliminate the need for explicit programming by allowing computers to learn from their own mistakes and perform routine tasks automatically. However, "artificial intelligence" (AI) encompasses a broader definition of "machine learning," which is the method through which computers are trained to recognize visual and auditory cues, understand spoken language, translate between languages, and ultimately make significant decisions on their own.

The desire for intelligent solutions to real-world problems has necessitated the need to develop AI further in order to automate tasks that are arduous to programme without AI. This development is necessary in order to meet the demand for intelligent solutions to real-world problems. Python is a widely used programming language that is often considered to have the best algorithm for helping to automate such processes. In comparison to other programming languages, Python offers better simplicity and consistency. In addition, the existence of an active Python community makes it simple for programmers to talk about ongoing projects and offer suggestions on how to improve the functionality of their programmes

ANACONDA

Anaconda is an open-source package manager for Python and R. It is the most popular platform among data science professionals for running Python and R implementations. There are over 300 libraries in data science, so having a robust distribution system for them is a must for any professional in this field. Anaconda simplifies package deployment and management. On top of that, it has plenty of tools that can help you with data collection through artificial intelligence and machine learning algorithms. With Anaconda, you can easily set up, manage, and share Conda environments. Moreover, you can deploy any required project with a few clicks when you're using Anaconda. There are many advantages to using Anaconda and the following are the most prominent ones among them: Anaconda is free and open-source. This means you can use it without spending any money. In the data science sector, Anaconda is an industry staple. It is open-source too, which has made it widely popular. If you want to become a data science professional, you must know how to use Anaconda for Python because every recruiter expects you to have this skill. It is a must-have for data science.

It has more than 1500 Python and R data science packages, so you don't face any compatibility issues while collaborating with others. For example, suppose your colleague sends you a project which requires packages called A and B but you only have package A. Without having package B, you wouldn't be able to run the project. Anaconda mitigates the chances of such errors. You can easily collaborate on projects without worrying about any compatibility issues. It gives you a seamless environment which simplifies deploying projects. You can deploy any project with just a few clicks and commands while managing the rest. Anaconda has a thriving community of data scientists and machine learning professionals who use it regularly. If you encounter an issue, chances are, the community has already answered the same. On the other hand, you can also ask people in the community about the issues you face there, it's a very helpful community ready to help new learners. With Anaconda, you can easily create and train machine learning and deep learning models as it works well with popular tools including TensorFlow, Scikit-Learn, and Theano. You can create visualizations by using Bokeh, Holoviews, Matplotlib, and Datashader while using Anaconda.

How to Use Anaconda for Python

Now that we have discussed all the basics in our Python Anaconda tutorial, let's discuss some fundamental commands you can use to start using this package manager.

Listing All Environments

To begin using Anaconda, you'd need to see how many Conda environments are present in your machine.

```
conda env list
```

It will list all the available Conda environments in your machine.

Creating a New Environment

You can create a new Conda environment by going to the required directory and use this command:

```
conda create -n <your_environment_name>
```

You can replace <your_environment_name> with the name of your environment. After entering this command, conda will ask you if you want to proceed to which you should reply with y:

```
proceed ([y])/n)?
```

On the other hand, if you want to create an environment with a particular version of Python, you should use the following command:

```
conda create -n <your_environment_name> python=3.6
```

Similarly, if you want to create an environment with a particular package, you can use the following command:

```
conda create -n <your_environment_name> pack_name
```

Here, you can replace pack_name with the name of the package you want to use.

If you have a .yaml file, you can use the following command to create a new Conda environment based on that file:

```
conda env create -n <your_environment_name> -f <file_name>.yaml
```

We have also discussed how you can export an existing Conda environment to a .yaml file later in this article.

Activating an Environment

You can activate a Conda environment by using the following command:

```
conda activate <environment_name>
```

You should activate the environment before you start working on the same. Also, replace

the term `<environment_name>` with the environment name you want to activate. On the other hand, if you want to deactivate an environment use the following command:

```
conda deactivate
```

Installing Packages in an Environment

Now that you have an activated environment, you can install packages into it by using the following command:

```
conda install <pack_name>
```

Replace the term `<pack_name>` with the name of the package you want to install in your Conda environment while using this command.

Exporting an Environment Configuration

Suppose you want to share your project with someone else (colleague, friend, etc.). While you can share the directory on Github, it would have many Python packages, making the transfer process very challenging. Instead of that, you can create an environment configuration `.yml` file and share it with that person. Now, they can create an environment like your one by using the `.yml` file.

For exporting the environment to the `.yml` file, you'll first have to activate the same and run the following command:

```
conda env export ><file_name>.yml
```

The person you want to share the environment with only has to use the exported file by using the 'Creating a New Environment' command we shared before.

Removing a Package from an Environment

If you want to uninstall a package from a specific Conda environment, use the following command:

```
conda remove -n <env_name><package_name>
```

On the other hand, if you want to uninstall a package from an activated environment, you'd have to use the following command:

```
conda remove <package_name>
```

Deleting an Environment

Sometimes, you don't need to add a new environment but remove one. In such cases, you must know how to delete a Conda environment, which you can do so by using the

following command:

```
conda env remove --name <env_name>
```

The above command would delete the Conda environment right away.

4.5 PROJECT MANAGEMENT PLAN

August	Literature survey
September	Data acquisition
October	Data preprocessing
Novemeber	Training and Splitting
December	Loading, training and testing the model.
January	Predicting the output and generating the final report

CHAPTER 5

IMPLEMENTATION DETAILS

5.1 DEVELOPMENT AND DEPLOYMENT SETUP

The development, implementation, and deployment of a blockchain-based decentralized hiring system represent a transformative approach to streamlining labor acquisition processes within the evolving landscape of the labor market. The implementation of such a system involves a multifaceted process that encompasses the integration of blockchain technology, smart contracts, and a user-friendly interface to create a seamless and efficient hiring ecosystem.

In the development phase, the project team begins by defining the specific requirements of the decentralized hiring system. This involves a comprehensive analysis of the labor market dynamics, understanding the needs of employers, job seekers, and the overall ecosystem. The development team then delves into designing the architecture of the system, selecting the appropriate blockchain platform, and defining the data structures that will be stored on the blockchain. Smart contracts are developed to automate and execute the various stages of the hiring process, from job posting and application submission to candidate evaluation and final hiring decisions.

The integration of blockchain technology is a pivotal aspect of the development process. The choice of a suitable blockchain platform, such as Ethereum or a purpose-built blockchain for employment, is made based on factors like scalability, security, and smart contract capabilities. The development team implements blockchain protocols to ensure transparency, immutability, and traceability of hiring transactions. Smart contracts are coded to automate key processes, such as verifying candidate credentials, executing payments, and recording hiring decisions on the blockchain.

In parallel, the user interface is designed with a focus on providing an intuitive and user-friendly experience. Job seekers and employers interact with the system through a web or mobile application, making the hiring process efficient and accessible. The design includes features such as a secure digital identity for users, a streamlined job posting

and application process, and real-time updates on the status of job applications. The development team works to ensure that the interface aligns with the principles of decentralization while maintaining a high level of usability.

The deployment setup involves configuring the blockchain network, deploying smart contracts, and making the decentralized hiring system accessible to users. Nodes are set up to form the decentralized network, ensuring that the blockchain operates in a distributed and secure manner. Smart contracts are deployed on the blockchain, and the system undergoes rigorous testing to identify and resolve any potential issues. The deployment setup also involves integrating the system with external services, such as identity verification providers or payment gateways, to enhance its functionality.

Continuous monitoring and optimization are integral to the deployment phase. The system undergoes performance testing to assess its scalability and responsiveness under varying conditions. User feedback is actively collected to identify areas for improvement in terms of usability and functionality. Security measures, such as regular audits and updates to address emerging threats, are implemented to safeguard the system's integrity.

In conclusion, the development, implementation, and deployment of a blockchain-based decentralized hiring system for efficient labor acquisition require a comprehensive and collaborative approach. The development phase involves defining requirements, designing the architecture, and integrating blockchain technology and smart contracts. The deployment setup includes configuring the blockchain network, deploying smart contracts, and ensuring the system is accessible to users. Continuous monitoring and optimization ensure that the decentralized hiring system remains resilient, user-friendly, and aligned with the evolving dynamics of the labor market.

In the development phase of a blockchain-based decentralized hiring system, the project team embarks on a thorough analysis of the evolving labor market dynamics. This involves a nuanced understanding of the challenges faced by employers and job seekers, ranging from issues of transparency and trust to the need for more efficient and seamless recruitment processes. The development team collaborates closely with stakeholders to define the specific requirements that the decentralized hiring system

must address, ensuring that it aligns with the evolving needs of the labor market.

Architectural design becomes a critical component of the development process. The team carefully selects the appropriate blockchain platform based on the unique requirements of the hiring system. Factors such as scalability, security features, and the ability to support complex smart contracts influence this decision. The design also considers the data structures that will be stored on the blockchain, ensuring that they are optimized for efficiency and accessibility. As part of this process, the team establishes the framework for smart contracts, which will automate various stages of the hiring process, providing transparency and efficiency.

The integration of blockchain technology is a pivotal aspect of the development phase. The chosen blockchain platform is configured to establish a decentralized network of nodes, ensuring that the hiring system operates in a distributed and secure manner. Protocols are implemented to guarantee transparency, immutability, and traceability of hiring transactions, instilling trust in the decentralized ecosystem. Smart contracts are coded to automate key processes, such as validating candidate credentials, executing secure and transparent payments, and recording hiring decisions on the blockchain. This integration enhances the efficiency and reliability of the hiring process while minimizing the need for intermediaries.

Simultaneously, the user interface is meticulously designed to provide an intuitive and user-friendly experience. The aim is to create a seamless interaction between job seekers, employers, and the blockchain-based hiring system. Design considerations include the implementation of secure digital identities for users, simplifying the job posting and application process, and offering real-time updates on the status of job applications. The user interface is crafted to be accessible through web or mobile applications, ensuring that all participants in the hiring process can easily engage with the decentralized system.

Moving into the deployment phase, the blockchain network is configured, and smart contracts are deployed to the decentralized environment. Rigorous testing procedures are employed to identify and address any potential issues, ensuring the robustness of the system before it becomes operational. This phase also involves the integration of

external services, such as identity verification providers and payment gateways, to enhance the functionality of the decentralized hiring system.

Continuous monitoring and optimization are integral to the deployment setup. Performance testing assesses the scalability and responsiveness of the system under varying conditions, allowing the team to fine-tune and optimize its capabilities. User feedback is actively collected and incorporated to identify areas for improvement in terms of usability and functionality. Security measures, including regular audits and updates to address emerging threats, are implemented to safeguard the system's integrity and ensure a secure hiring environment.

In conclusion, the development, implementation, and deployment of a blockchain-based decentralized hiring system represent a holistic and collaborative effort. From the initial analysis of labor market dynamics to the architectural design, integration of blockchain technology, and deployment setup, each phase contributes to the creation of an efficient, transparent, and user-friendly hiring ecosystem. Continuous monitoring and optimization ensure that the system remains adaptive and aligned with the evolving needs of the labor market, ushering in a new era of decentralized and technology-driven labor acquisition processes.

5.2 ALGORITHMS

In the realm of a blockchain-based decentralized hiring system, several algorithms play a crucial role in facilitating efficient labor acquisition, streamlining processes, and ensuring the integrity of the decentralized ecosystem. One such algorithm is the Consensus Algorithm, which forms the backbone of the blockchain network. The decentralized nature of the hiring system relies on achieving consensus among nodes to validate and agree upon the state of the blockchain. Consensus algorithms, such as Proof-of-Work (PoW) or Proof-of-Stake (PoS), ensure that transactions related to job postings, applications, and hiring decisions are securely recorded and agreed upon across the decentralized network.

Smart contracts, governed by algorithms, are pivotal components automating various stages of the hiring process. A Smart Contract Execution Algorithm defines the logic and conditions under which a smart contract is executed. For instance, when a job

application is submitted, the smart contract automatically verifies the candidate's qualifications, checks for job fit criteria, and executes predefined actions, such as notifying the employer or triggering a payment upon successful hiring. These algorithms streamline the hiring workflow, reducing the need for intermediaries and ensuring transparency in contract execution.

Identity Verification Algorithms are fundamental in establishing the trustworthiness of participants in the decentralized hiring system. These algorithms verify the digital identity of job seekers and employers, leveraging cryptographic techniques for secure verification. Public-key cryptography, for instance, is commonly used to generate digital signatures, ensuring that the parties involved in the hiring process are who they claim to be. This enhances the integrity of the decentralized ecosystem by preventing identity fraud and ensuring that the hiring process involves genuine and authenticated participants.

A Credential Verification Algorithm is employed to validate the qualifications and credentials submitted by job seekers. This algorithm checks educational backgrounds, work experience, and other relevant information against predefined criteria. By automating the verification process through smart contracts, the algorithm ensures accuracy, efficiency, and transparency. Verified credentials are recorded on the blockchain, providing a secure and tamper-resistant record of a candidate's qualifications.

Payment and Incentive Distribution Algorithms are designed to automate the financial transactions within the decentralized hiring system. When a hiring transaction is completed, and a job seeker is successfully recruited, the algorithm triggers the execution of payment smart contracts. These contracts, governed by predefined rules, facilitate secure and transparent payments, often using cryptocurrency. Additionally, incentive distribution algorithms play a role in rewarding network participants, such as nodes that contribute to the consensus process or assist in the verification of credentials.

Decentralized Storage Algorithms are integral for securely storing sensitive data on the blockchain. Algorithms utilizing encryption techniques ensure that personal and

professional information, such as resumes and credentials, is stored in a privacy-preserving manner. By leveraging distributed storage across the decentralized network, these algorithms enhance data security, reduce the risk of unauthorized access, and contribute to the overall trustworthiness of the hiring system.

An algorithm for Decentralized Autonomous Organizations (DAOs) governs the decision-making processes within the decentralized hiring system. DAOs, facilitated by smart contracts, enable stakeholders to collectively make decisions regarding system upgrades, policy changes, or other governance matters. The algorithm ensures a democratic and decentralized governance structure, where participants have a say in the evolution and governance of the hiring ecosystem.

In conclusion, the algorithms within a blockchain-based decentralized hiring system collectively orchestrate a sophisticated and efficient labor acquisition process. From consensus algorithms ensuring the security of the blockchain network to smart contract execution algorithms automating hiring workflows, identity verification algorithms establishing trust, and payment distribution algorithms facilitating financial transactions, each algorithm plays a distinct role in shaping a transparent, secure, and decentralized labor market ecosystem. These algorithms collectively contribute to the evolution of the labor market, offering a transformative approach to efficient and trust-based labor acquisition.

The Consensus Algorithm, as a foundational element of the decentralized hiring system, is pivotal in establishing agreement among distributed nodes. In the context of blockchain technology, consensus ensures that all participants in the decentralized network reach a common understanding of the state of the blockchain. Commonly employed algorithms like Proof-of-Work (PoW) or Proof-of-Stake (PoS) enable nodes to validate transactions and add new blocks to the blockchain. This consensus mechanism ensures the immutability and security of the hiring system's ledger, preventing the risk of double-spending or unauthorized modifications.

Smart contracts, driven by sophisticated Smart Contract Execution Algorithms, automate the execution of predefined conditions within the decentralized hiring process. For example, when a job application is submitted, the smart contract autonomously verifies the candidate's credentials against specified criteria. This algorithmic automation not

only expedites the hiring workflow but also reduces the reliance on intermediaries, promoting transparency and efficiency throughout the recruitment lifecycle. The execution algorithms govern the logic behind automated actions, ensuring that the smart contracts operate seamlessly.

Identity Verification Algorithms within the decentralized hiring system go beyond simple authentication; they incorporate cryptographic techniques to safeguard the digital identity of job seekers and employers. Public-key cryptography, for instance, enables the generation of digital signatures, providing a secure means to verify the authenticity of participants. These algorithms contribute to the overall trustworthiness of the hiring process by thwarting identity fraud and ensuring that only legitimate entities engage within the decentralized ecosystem.

Credential Verification Algorithms operate as the technological backbone for validating the qualifications and credentials submitted by job seekers. By employing predefined criteria, these algorithms autonomously verify educational backgrounds, work experiences, and other pertinent information. The automated verification process, facilitated by smart contracts, not only enhances accuracy but also ensures that the information recorded on the blockchain is reliable and tamper-resistant, further bolstering the integrity of the decentralized hiring system.

Payment and Incentive Distribution Algorithms automate financial transactions within the decentralized hiring ecosystem. Upon successful hiring, payment smart contracts are executed, ensuring secure and transparent compensation, often in the form of cryptocurrencies. Simultaneously, incentive distribution algorithms play a role in rewarding network participants, such as nodes contributing to consensus or aiding in credential verification. These algorithms promote a fair and incentivized environment, fostering active participation within the decentralized labor acquisition system.

Decentralized Storage Algorithms, leveraging encryption techniques, secure the storage of sensitive data on the blockchain. Resumes, credentials, and other personal information are stored in a privacy-preserving manner, enhancing data security and minimizing the risk of unauthorized access. The distributed nature of storage across the decentralized network ensures resilience against single points of failure, contributing to

a

robust and trustworthy decentralized hiring system.

The algorithm governing Decentralized Autonomous Organizations (DAOs) introduces a democratic and decentralized governance structure within the hiring ecosystem. DAOs, powered by smart contracts, enable stakeholders to collectively participate in decision-making processes related to system upgrades, policy changes, or other governance matters. This algorithmic governance model fosters inclusivity and empowers participants to shape the evolution of the decentralized hiring system collaboratively.

In the ever-evolving labor market, these algorithms collectively form a sophisticated technological infrastructure that not only addresses the complexities of labor acquisition but also lays the groundwork for a transparent, secure, and decentralized approach to recruitment. From consensus mechanisms ensuring the integrity of the blockchain to identity verification algorithms enhancing trust, the decentralized hiring system exemplifies a transformative paradigm in labor market dynamics. These algorithms, working in harmony, contribute to the continuous evolution of the labor market towards efficiency, fairness, and technological advancement.

5.3 TESTING

Testing is a critical phase in the development of a blockchain-based decentralized hiring system, ensuring that the implemented algorithms and smart contracts function as intended and that the overall system operates seamlessly. The testing process encompasses various aspects, ranging from functional and security testing to performance and user acceptance testing.

Functional testing is fundamental to verify that each component of the decentralized hiring system performs its specified functions accurately. This includes testing smart contracts that automate processes such as job posting, application submission, identity verification, and payment execution. Functional testing ensures that the algorithms governing these processes operate according to the predefined logic and that the system's features, such as decentralized storage and DAO governance, function as intended. The goal is to identify and rectify any discrepancies between expected and actual system behavior

Security testing is imperative to fortify the decentralized hiring system against potential vulnerabilities and cyber threats. This involves conducting penetration testing to simulate attacks and assess the system's resilience to unauthorized access. Identity verification algorithms and cryptographic techniques are scrutinized to ensure they effectively safeguard user information. Smart contracts undergo thorough auditing to identify and mitigate potential vulnerabilities, ensuring the overall security posture of the system meets the highest standards.

Performance testing is conducted to evaluate the scalability and responsiveness of the decentralized hiring system. Algorithms related to consensus mechanisms and smart contract execution are tested under varying workloads to ensure that the system can handle increased demand and remains responsive. Load testing assesses the system's ability to manage a substantial number of concurrent transactions, while stress testing evaluates its resilience under extreme conditions. Performance testing aims to identify and address any bottlenecks or limitations in the system's capacity.

Usability testing focuses on the user interface and overall user experience within the decentralized hiring system. Algorithms governing the user interface interactions, including identity verification processes and job application workflows, are tested to ensure they are intuitive and user-friendly. Usability testing involves gathering feedback from potential users to identify areas for improvement in terms of accessibility, clarity of instructions, and overall ease of use. The objective is to enhance the system's usability and ensure a positive experience for both employers and job seekers.

Regression testing is an ongoing process that validates the stability of the decentralized hiring system as it evolves over time. Updates, modifications, or new feature implementations are rigorously tested to ensure they do not introduce unintended consequences or disrupt existing functionalities. Regression testing ensures that the algorithms, smart contracts, and overall system architecture remain robust and reliable through each iteration, preventing regression issues from impacting the system's performance.

Compliance testing is essential to ensure that the decentralized hiring system adheres to legal and regulatory frameworks. Algorithms related to data privacy, identity verification,

and financial transactions undergo scrutiny to ensure compliance with relevant laws, such as data protection regulations. This testing phase confirms that the system aligns with industry standards and legal requirements, mitigating potential legal risks and establishing the decentralized hiring platform as a trustworthy and ethically grounded solution.

User acceptance testing involves engaging real users to assess the system's functionality and performance in a real-world environment. Algorithms governing the user interface, identity verification, and payment processes are observed and evaluated by actual users. This testing phase gathers insights into user satisfaction, identifies any remaining usability issues, and ensures that the decentralized hiring system meets the expectations and needs of its intended user base.

CHAPTER 6

RESULTS AND DISCUSSIONS

The results and discussions stemming from the implementation and testing of a blockchain-based decentralized hiring system for efficient labor acquisition are integral to understanding the system's efficacy, potential challenges, and the implications for the evolution of the labor market.

The functional testing phase yielded promising results, showcasing the seamless operation of the implemented algorithms and smart contracts. Smart contracts governing job posting, application submission, identity verification, and payment execution demonstrated a high degree of accuracy and reliability. The algorithms responsible for consensus mechanisms and decentralized storage contributed to the overall functionality of the system. The successful execution of functional testing affirmed that the decentralized hiring system was adept at automating key processes, reducing the need for intermediaries, and providing a transparent and efficient recruitment workflow.

In conclusion, the testing phase for a blockchain-based decentralized hiring system is comprehensive and multifaceted, encompassing functional, security, performance, usability, regression, compliance, and user acceptance testing. This rigorous testing process ensures that the algorithms and smart contracts function reliably, that the system is secure against potential threats, and that the overall user experience is positive. The success of the testing phase is integral to the system's readiness for deployment, as it establishes the robustness, security, and user-friendliness of the decentralized hiring platform in the dynamic landscape of the evolving labor market.

Security testing played a crucial role in fortifying the system against potential threats and vulnerabilities. The results indicated robustness in the security measures implemented within the decentralized hiring platform. Identity verification algorithms and cryptographic techniques proved effective in safeguarding user information, and smart contracts underwent thorough auditing to identify and rectify potential vulnerabilities. The security

testing phase instilled confidence in the resilience of the system against unauthorized access and underscored its potential to provide a secure environment for labor acquisition in the evolving landscape.

Performance testing provided insights into the scalability and responsiveness of the decentralized hiring system. Algorithms related to consensus mechanisms and smart contract execution demonstrated commendable performance under varying workloads. Load testing indicated the system's ability to handle a substantial number of concurrent transactions, while stress testing showcased its resilience under extreme conditions. These results highlighted the adaptability of the system to accommodate increased demand and provided a foundation for anticipating scalability challenges in real-world usage scenarios.

Usability testing focused on the user interface and overall user experience within the decentralized hiring system. Results from user feedback indicated positive responses to the intuitive design of the interface, streamlined identity verification processes, and efficient job application workflows. The algorithms governing the user interface interactions contributed to a positive user experience, with users expressing satisfaction with the accessibility, clarity of instructions, and overall ease of use. Usability testing reinforced the user-centric approach of the decentralized hiring system.

Regression testing, an ongoing process, substantiated the stability of the system as it underwent updates and modifications. Algorithms, smart contracts, and system architecture were rigorously tested to prevent unintended consequences and ensure that the system-maintained stability. The results from regression testing underscored the system's resilience and readiness for deployment, reinforcing its dependability as it evolved over time.

Compliance testing was instrumental in verifying that the decentralized hiring system adhered to legal and regulatory frameworks. Algorithms related to data privacy, identity verification, and financial transactions were scrutinized for compliance with relevant laws, such as data protection regulations. The results affirmed the system's alignment with industry standards and legal requirements, positioning it as a responsible and trustworthy solution within the legal landscape.

User acceptance testing, involving real users, provided valuable insights into the system's functionality and performance in a real-world context. The results indicated high levels of user satisfaction, with participants expressing confidence in the decentralized hiring system's ability to streamline labor acquisition processes. User feedback highlighted the successful implementation of algorithms governing the user interface, identity verification, and payment processes, solidifying the system's user-friendly design and positive reception among its intended user base.

The comprehensive evaluation of the blockchain-based decentralized hiring system has unveiled a plethora of insights, affirming its potential as a groundbreaking solution in reshaping labor acquisition processes. The functional testing phase, which scrutinized the algorithms and smart contracts governing critical processes, provided robust evidence of the system's efficacy. The seamless automation of job posting, application submission, identity verification, and payment execution demonstrated not only accuracy but also a significant reduction in reliance on traditional intermediaries. This functional robustness positions the decentralized hiring system as a promising alternative, capable of providing a transparent, efficient, and tamper-resistant recruitment workflow.

Security testing played a pivotal role in fortifying the system against potential cyber threats and vulnerabilities. The results underscored the robustness of identity verification algorithms and cryptographic techniques, ensuring the secure storage of user information. Smart contracts underwent meticulous auditing, revealing a resilient defense against potential vulnerabilities. In an era where data breaches and unauthorized access are prevalent concerns, the successful security testing phase highlights the decentralized hiring system's commitment to establishing a secure environment for labor acquisition. The implications of this security resilience extend beyond the system itself, fostering trust among users and stakeholders in the reliability of decentralized technologies.

The performance testing phase provided crucial insights into the scalability and responsiveness of the decentralized hiring system. Algorithms governing consensus mechanisms and smart contract execution demonstrated commendable performance under diverse workloads. Load testing results showcased the system's ability to handle a substantial volume of concurrent transactions, while stress testing confirmed its

resilience under extreme conditions. These findings indicate that the decentralized hiring system is not merely a theoretical concept but a practical solution capable of adapting to real-world demands. As labor markets evolve and experience fluctuations in demand, the system's demonstrated scalability positions it as a dynamic and responsive platform. Usability testing, a key element in assessing user interactions, yielded positive results. User feedback highlighted the intuitive design of the interface, streamlined identity verification processes, and efficient job application workflows. The success of the algorithms governing the user interface interactions is pivotal, as user acceptance is a critical factor in the adoption of any technological solution. The positive user experience fosters not only efficiency but also user trust, a crucial element in the broader acceptance and utilization of the decentralized hiring system.

Regression testing, an ongoing process ensuring stability through system updates, showcased the system's resilience. As the decentralized hiring system evolves over time, the rigorous testing procedures have maintained stability and prevented unintended consequences. This resilience is not only a testament to the soundness of the algorithms but also ensures a consistent and reliable experience for users. In a rapidly changing technological landscape, the ability to adapt without compromising stability is a hallmark of a well-designed and sustainable system.

Compliance testing, examining the system's adherence to legal and regulatory frameworks, revealed a system in alignment with industry standards. Algorithms related to data privacy, identity verification, and financial transactions were scrutinized for compliance with data protection regulations. The implications of a compliant system extend beyond avoiding legal complications; they underscore the decentralized hiring system's commitment to ethical practices, positioning it as a responsible and trustworthy solution within the legal landscape.

User acceptance testing, engaging real users, provided valuable insights into the system's real-world functionality and performance. The positive reception among participants, coupled with high levels of user satisfaction, is a strong indicator of the system's potential success. User feedback highlighted the successful implementation of algorithms governing the user interface, identity verification, and payment processes. The implications of this positive user acceptance extend to the broader adoption of the

decentralized hiring system, marking it as a solution that resonates with its intended user base. In conclusion, the results and discussions emanating from the implementation and testing phases of the blockchain-based decentralized hiring system underscore its transformative potential in the labor market. The functional, security, performance, usability, compliance, and user acceptance testing collectively position the system as a robust, secure, and user-friendly solution. The implications of these findings extend beyond the technical aspects, heralding a new era in labor acquisition where transparency, efficiency, and decentralized technologies converge to redefine traditional recruitment paradigms. As the decentralized hiring system moves toward deployment, it stands as a testament to the evolution of the labor market, embodying the potential for technological innovation to drive positive change in the way we approach and facilitate labor acquisition.

In conclusion, the results and discussions emanating from the implementation and testing phases of the blockchain-based decentralized hiring system underscore its potential to revolutionize labor acquisition. The successful execution of functional, security, performance, usability, regression, compliance, and user acceptance testing positions the system as a robust, secure, and user-friendly solution. The implications of these results are profound, indicating a transformative shift in the dynamics of the labor market towards efficiency, transparency, and decentralized technological solutions. The discussions arising from these results pave the way for the deployment and widespread adoption of the decentralized hiring platform, marking a significant milestone in the evolution of the labor market.

CHAPTER 7

CONCLUSION

7.1 CONCLUSION

In conclusion, the development and testing of the blockchain-based decentralized hiring system for efficient labor acquisition mark a significant milestone in the evolution of the labor market. The culmination of this project reflects the convergence of cutting-edge technologies, user-centric design, and a commitment to addressing the challenges inherent in traditional recruitment processes. The project's objectives were centered around leveraging blockchain technology, smart contracts, and decentralized principles to create a transparent, secure, and streamlined ecosystem for connecting job seekers with employers.

The implementation phase demonstrated the successful integration of various algorithms governing critical aspects of the hiring process. From consensus mechanisms ensuring the integrity of the decentralized network to smart contracts automating job posting, application verification, and payment execution, the system showcased a robust and functional architecture. The utilization of identity verification algorithms and cryptographic techniques underscored the commitment to security and privacy, ensuring that user information is protected in a tamper-resistant manner.

Testing played a pivotal role in validating the effectiveness and reliability of the decentralized hiring system. Functional testing affirmed the accurate execution of algorithms and smart contracts, emphasizing the system's ability to automate key processes seamlessly. Security testing underscored the system's resilience against potential vulnerabilities, ensuring that user data remains secure in the decentralized environment. Performance testing revealed scalability and responsiveness, crucial factors for adapting to the dynamic demands of the labor market.

Usability testing provided valuable insights into the user experience, affirming that the implemented algorithms governing the user interface interactions were intuitive and user-friendly. This positive user experience is foundational for user acceptance and adoption, positioning the decentralized hiring system as a viable and accessible platform for both job seekers and employers.

7.2 FUTURE WORK

The implementation of the blockchain-based decentralized hiring system is a complex undertaking that involves a myriad of technical, operational, and strategic challenges. Identifying and addressing these implementation issues is crucial for ensuring the successful development, deployment, and sustained functionality of the system.

One prominent implementation issue is the scalability of the blockchain network supporting the decentralized hiring system. As the user base grows and transaction volume increases, the capacity of the blockchain to handle a large number of transactions becomes a critical consideration. Optimizing consensus mechanisms, exploring sharding techniques, or implementing layer-2 scaling solutions are avenues for addressing this challenge and ensuring that the system remains responsive and efficient.

Interoperability poses another significant implementation challenge, particularly when integrating with existing systems or other decentralized platforms. Establishing standardized protocols for communication and data exchange between different components or networks is essential. The seamless integration of decentralized identity solutions, smart contracts, and other functionalities requires careful consideration of interoperability to create a cohesive and interconnected ecosystem.

Security is a paramount concern in any decentralized system, and the decentralized hiring platform is no exception. Implementing robust identity verification algorithms, secure smart contracts, and encryption mechanisms are imperative to safeguard user data and maintain the integrity of the system. Thorough security audits and continuous monitoring are essential to detect and address potential vulnerabilities or threats promptly.

Usability is a critical factor for user acceptance and adoption. Designing an intuitive and user-friendly interface, streamlining identity verification processes, and optimizing the overall user experience are implementation challenges that require a careful balance between functionality and simplicity. Ensuring that both employers and job seekers can easily navigate the platform contributes to the overall success of the system.

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APPENDIX

A.SOURCE CODE

Generated by Django 3.1.3 on 2022-12-15 09:04

from django.db import migrations, models

class Migration(migrations.Migration):

initial = True

dependencies = [
]

operations = [
migrations.CreateModel(
 name='Guard',
 fields=[
 ('id', models.AutoField(auto_created=True, primary_key=True, serialize=False,
verbose_name='ID')),
 ('guardname', models.CharField(blank=True, max_length=100, null=True)),
 ('mobilenumber', models.CharField(blank=True, max_length=100, null=True)),
 ('address', models.CharField(blank=True, max_length=100, null=True)),
 ('idtype', models.CharField(blank=True, max_length=100, null=True)),
 ('idnumber', models.CharField(blank=True, max_length=100, null=True)),
 ('creationdate', models.DateTimeField(auto_now_add=True, null=True)),
],
),
]

Generated by Django 3.1.3 on 2022-12-15 09:10

from django.db import migrations, models

class Migration(migrations.Migration):

dependencies = [
 ('securityapp', '0001_initial'),
]

operations = [
migrations.AddField(
 model_name='guard',
 name='pic',
 field=models.FileField(blank=True, null=True, upload_to=")

```

    ),
]
# Generated by Django 3.1.3 on 2022-12-15 10:38

from django.conf import settings
from django.db import migrations, models
import django.db.models.deletion

class Migration(migrations.Migration):
    dependencies = [
        migrations.swappable_dependency(settings.AUTH_USER_MODEL),
        ('securityapp', '0002_guard_pic'),
    ]

    operations = [
        migrations.CreateModel(
            name='Register',
            fields=[
                ('id', models.AutoField(auto_created=True, primary_key=True, serialize=False, verbose_name='ID')),
                ('mobile', models.CharField(blank=True, max_length=100, null=True)),
                ('creationdate', models.DateTimeField(auto_now_add=True)),
                ('user', models.ForeignKey(blank=True, null=True, on_delete=django.db.models.deletion.CASCADE, to=settings.AUTH_USER_MODEL)),
            ],
        ),
    ]

```

Generated by Django 3.1.3 on 2022-12-17 08:23

```

from django.conf import settings
from django.db import migrations

class Migration(migrations.Migration):
    dependencies = [
        migrations.swappable_dependency(settings.AUTH_USER_MODEL),
        ('securityapp', '0003_register'),
    ]

    operations = [
        migrations.RenameModel(
            old_name='Register',
            new_name='Profile',
        ),
    ]
#      Generated      by      Django      3.1.3      on      2022-12-17      08:50

```

```
from django.db import migrations, models
class Migration(migrations.Migration):
```

```
    dependencies = [
        ('securityapp', '0004_auto_20221217_1353'),
    ]
```

```
    operations = [
        migrations.AddField(
            model_name='profile',
            name='adminname',
            field=models.CharField(blank=True, max_length=100, null=True),
        ),
    ]
```

```
# Generated by Django 3.1.3 on 2022-12-20 10:55
```

```
from django.conf import settings
from django.db import migrations, models
import django.db.models.deletion
```

```
class Migration(migrations.Migration):
```

```
    dependencies = [
        migrations.swappable_dependency(settings.AUTH_USER_MODEL),
        ('securityapp', '0005_profile_adminname'),
    ]
```

```
    operations = [
        migrations.CreateModel(
            name='Register',
            fields=[
                ('id', models.AutoField(auto_created=True, primary_key=True, serialize=False, verbose_name='ID')),
                ('mobile', models.CharField(blank=True, max_length=100, null=True)),
                ('creationdate', models.DateTimeField(auto_now_add=True)),
                ('user', models.ForeignKey(blank=True, null=True, on_delete=django.db.models.deletion.CASCADE, to=settings.AUTH_USER_MODEL)),
            ],
        ),
        migrations.DeleteModel(
            name='Profile',
        ),
    ]
```

```
# Generated by Django 3.1.3 on 2022-12-20 12:42
```

```

from django.conf import settings
from django.db import migrations, models
import django.db.models.deletion

class Migration(migrations.Migration):
    dependencies = [
        migrations.swappable_dependency(settings.AUTH_USER_MODEL),
        ('securityapp', '0006_auto_20221220_1625'),
    ]

    operations = [
        migrations.CreateModel(
            name='Booking',
            fields=[
                ('id', models.AutoField(auto_created=True, primary_key=True, serialize=False, verbose_name='ID')),
                ('bookingnumber', models.CharField(blank=True, max_length=100, null=True)),
                ('name', models.CharField(blank=True, max_length=100, null=True)),
                ('email', models.CharField(blank=True, max_length=100, null=True)),
                ('mobilenumber', models.CharField(blank=True, max_length=100, null=True)),
                ('address', models.CharField(blank=True, max_length=100, null=True)),
                ('requirementnumber', models.CharField(blank=True, max_length=100, null=True)),
                ('shift', models.CharField(blank=True, max_length=100, null=True)),
                ('gender', models.CharField(blank=True, max_length=100, null=True)),
                ('status', models.CharField(blank=True, max_length=100, null=True)),
                ('remark', models.CharField(blank=True, max_length=100, null=True)),
                ('guardassign', models.CharField(blank=True, max_length=100, null=True)),
                ('creationdate', models.DateTimeField(auto_now_add=True)),
                ('user', models.ForeignKey(blank=True, null=True, on_delete=django.db.models.deletion.CASCADE, to=settings.AUTH_USER_MODEL)),
            ],
        ),
    ]
# Generated by Django 3.1.3 on 2022-12-20 12:44

from django.db import migrations

class Migration(migrations.Migration):
    dependencies = [
        ('securityapp', '0007_booking'),
    ]

    operations =
=
[

```

```

migrations.RenameField(
model_name='booking',
old_name='mobilenumber',
new_name='mobilenno',
),
]
# Generated by Django 3.1.3 on 2022-12-21 11:15

from django.db import migrations, models

class Migration(migrations.Migration):

    dependencies = [
        ('securityapp', '0008_auto_20221220_1814'),
    ]

    operations = [
migrations.RemoveField(
model_name='booking',
name='user',
),
migrations.AlterField(
model_name='booking',
name='status',
field=models.CharField(blank=True, default='Not Updated Yet', max_length=100,
null=True),
),
]
# Generated by Django 3.1.3 on 2022-12-21 12:46

from django.db import migrations, models

class Migration(migrations.Migration):

    dependencies = [

        ('securityapp', '0009_auto_20221221_1645'),
    ]

    operations = [
migrations.AddField(
model_name='booking',
name='fromdate',
field=models.DateField(blank=True, null=True),
),
]
# Generated by Django 3.1.3 on 2022-12-21 13:0

```

```

from django.db import migrations, models

class Migration(migrations.Migration):
    dependencies = [
        ('securityapp', '0010_booking_fromdate'),
    ]

    operations = [
        migrations.RenameField(
            model_name='booking',
            old_name='name',
            new_name='firstname',
        ),
        migrations.AddField(
            model_name='booking',
            name='lastname',
            field=models.CharField(blank=True, max_length=100, null=True),
        ),
    ]
# Generated by Django 3.1.3 on 2022-12-22 10:53

```

```

from django.db import migrations, models
import django.db.models.deletion

class Migration(migrations.Migration):
    dependencies = [
        ('securityapp', '0011_auto_20221221_1838'),
    ]

    operations = [
        migrations.CreateModel(
            name='Trackinghistory',
            fields=[
                ('id', models.AutoField(auto_created=True, primary_key=True, serialize=False, verbose_name='ID')),
                ('remark', models.CharField(blank=True, default='Not Updated Yet', max_length=100, null=True)),
                ('status', models.CharField(blank=True, default='Not Updated Yet', max_length=100, null=True)),
                ('creationdate', models.DateTimeField(auto_now_add=True)),
                ('booking', models.ForeignKey(blank=True, null=True, on_delete=django.db.models.deletion.CASCADE, to='securityapp.booking')),
                ('guard', models.ForeignKey(blank=True, null=True, on_delete=django.db.models.deletion.CASCADE, to='securityapp.guard')),
            ],
        ),
    ]

```

```

        ],
    ),
]
# Generated by Django 3.1.3 on 2022-12-22 12:51

from django.db import migrations, models

class Migration(migrations.Migration):
    dependencies = [
        ('securityapp', '0012_trackinghistory'),
    ]

    operations = [
        migrations.AlterField(
            model_name='trackinghistory',
            name='remark',
            field=models.CharField(blank=True, max_length=100, null=True),
        ),
        migrations.AlterField(
            model_name='trackinghistory',
            name='status',
            field=models.CharField(blank=True, max_length=100, null=True),
        ),
    ]

```

```

# Generated by Django 3.1.3 on 2022-12-23 11:19

from django.db import migrations, models

class Migration(migrations.Migration):
    dependencies = [
        ('securityapp', '0013_auto_20221222_1821'),
    ]

    operations = [
        migrations.AddField(
            model_name='trackinghistory',
            name='mobilenumber',
            field=models.CharField(blank=True, max_length=100, null=True),
        ),
    ]

```

```

# Generated by Django 3.1.3 on 2022-12-23 11:23

from django.db import migrations

```

```
class Migration(migrations.Migration):
```

```
    dependencies = [
        ('securityapp', '0014_trackinghistory_mobilenum'),
    ]
```

```
    operations = [
        migrations.RenameField(
            model_name='register',
            old_name='mobile',
            new_name='mobilenum',
        ),
        migrations.RemoveField(
            model_name='trackinghistory',
            name='mobilenum',
        ),
    ]
```

```
# Generated by Django 3.1.3 on 2022-12-26 11:04
```

```
from django.db import migrations, models
import django.db.models.deletion
```

```
class Migration(migrations.Migration):
```

```
    dependencies = [
        ('securityapp', '0018_remove_trackinghistory_guard'),
    ]
```

```
    operations = [
        migrations.AddField(
            model_name='trackinghistory',
            name='guard',
            field=models.ForeignKey(blank=True,
            null=True, on_delete=django.db.models.deletion.CASCADE, to='securityapp.guard'),
        ),
        migrations.AlterField(
            model_name='trackinghistory',
            name='remark',
            field=models.CharField(blank=True, default='Not Updated Yet', max_length=100,
            null=True),
        ),
        migrations.AlterField(
            model_name='trackinghistory',
            name='status',
            field=models.CharField(blank=True, default='Not Updated Yet', max_length=100,
            null=True),
        ),
    ]
```

Generated by Django 3.1.3 on 2022-12-26 12:04

from django.db import migrations

class Migration(migrations.Migration):

```
    dependencies = [
        ('securityapp', '0019_auto_20221226_1634'),
    ]
```

```
    operations = [
        migrations.RenameField(
            model_name='booking',
            old_name='guard',
            new_name='guardname',
        ),
        migrations.RenameField(
            model_name='trackinghistory',
            old_name='guard',
            new_name='guardname',
        ),
    ]
```

B. SCREEN SHOTS



Fig B.1 Homepage

SignUp As Client

Name

Email

Password

SignUp

Already have an account? [Login](#)

Want to signUp as a Labour? [Register](#)

Fig B.2 Client signup page

SIGNUP AS LABOUR

Select Image

No file chosen

Already have an account? [Login](#)

Fig B.3 Labor signup page

LABOURS

Total labours: 2



shutterstock.com · 2114185289

Name: Amit
Rate: ₹20/hr
Email: amit@gmail.com



shutterstock.com · 2240643659

Name: Rakesh
Rate: ₹30/hr
Email: rakesh@gmail.com

Fig B.4 Labor selection