

VATSAG: An Application for Scouting Authorised Professionals

R Aparna¹, Gowtham P², Sai Suhas P³, Vaishnav Puram⁴ and Saurav Biswas⁵

¹⁻⁵Siddaganga Institution of Technology, Information Science and Engineering Department, Tumakuru, Karnataka, India
Email: raparna@sit.ac.in, gowtham.1si18is016@gmail.com, saisuhaspsuhas@gmail.com, vaishnavpuram27@gmail.com, hulo.lalpile@gmail.com

Abstract—According to recent studies which show that there is a vast generation of data, this data can act as a resource to hackers to retrieve Personal Identifiable Information (PII) that can be used to perform any sort of fraudulent activities. For any organisation protecting their customer/client data is very much essential. It is also necessary to maintain integrity of the information that has been stored. This application provides protection and integrity to information provided by the customer/client.

The paper discusses building a platform to help people to hire a professional in the same locality and also helps independent professionals or early professionals to work for customers. This platform will include professionals like electricians, plumbers, carpenters, housemaids etc. These professionals will be verified by collecting their identity proofs, so that if they try to pull off any sort of illegal activities, they could be tracked down. Thus, there is a sense of proof for the customers to use this platform and there will be no trust issues. There will be a separate page for these professionals to give their credentials to the platform and it will be added to the customer's platform. The customer will sign up to the platform and will be verified as well. After customer registration, based on their locality, professionals information in the same locality will be shown to them and based on the kind of work they are in need of, they can hire that person. The customers can know the past experiences of them from other customers who are using the same application. The customer can also find the contact information of professionals and communicate with them. Also, this platform enables customers to give feedback for the professionals which will increase the ratings of the professionals.

The main objective of this work is to identify and popularise local independent professionals to show their expertise.

Index Terms— Blockchain, Customers, Professionals, Protection, Natural Language Processing, Smart Contracts.

I. INTRODUCTION

Blockchain is one of the buzzwords that we have been hearing a lot these days. Domain of blockchain is growing at a rapid rate with community support. Normally for saving sort of sensitive data in any form we use encryption that can help secure the content and decrypted by only the intended user. Even though enough encryption algorithms have been developed that cannot be cracked with a high computing power, there are limitations associated with the encryption algorithms.

In order to secure data from being modified from any sort of techniques and maintain the integrity of the data,

we are using blockchain in our work. When we move from one place to another there are a lot of things that they tend to change based on their wishes, like the colour of the paint on walls of a house, wood works, renovating interiors etc. For all these sorts of work it is necessary to search for people with specific skills who can do the job and who are readily available nearby. As they are new to the place it would be difficult to find an expert and it's time consuming too. So, there must be a platform where there are many professionals who can register to the platform and provide their services to the customer. Thus, the application can help the user who has recently moved into a place to hire a specific professional. This platform provides verified professionals with the skills needed for the customer, and uses the blockchain technology we are protecting the PII of both the customers and professionals. The application is using blockchain to provide integrity, security, and availability of data. It is also using the Natural Language Processing (NLP) model to give rating to the professionals from the customer feedback, which helps other users to review professionals with respect to their specific needs.

The objectives of this paper are as listed below and also listed are the motivation behind developing such a product that can help the community to grow.

A. Objectives

The main objectives of the work are as follows:

1. To create a platform where people can trust independent professionals.
2. To create a platform to empower local independent professionals.
3. To create a secure application where no one can alter any information.

B. Motivation

The key driving force behind the decision to create this product was:

1. To promote local business professionals and to support the local community
2. To provide a sense of security and trust to customers so that they trust the professionals hired.
3. To provide a platform that helps customers get their household chores done by local businesses.

II. Literature Survey

To the best of our knowledge, this work is first of its kind in the literature and it is a standalone application, hence, there is no literature available in this field of work. So, the literature survey is on the basics of blockchain and its applications.

In [2], authors talk about how blockchain has become a recent buzzword. Then describes different applications of blockchain like smart contracts that do not need any third party to maintain and execute the contracts and builds trust between the parties involved in it. Smart contracts can be used in Contract Management, Entertainment, Health Care, Insurance etc. Similar to the Smart Contract implementation, they also describe many implementations that can be used in the present world like e-Government, Financial Industry, Real-time Accounting, Business Process Management etc. They conclude by mentioning the challenges that are faced in the implementation of blockchain. This work uses smart contracts to save the PII of customers and professionals who are registering to the platform.

The authors in [3], talk about blockchain architecture that are public, private and consortium. They describe the key characteristics of the blockchain like decentralised, persistency, anonymity, availability. They talk about the advancements in the consensus algorithm from proof of Work(PoW) to Ripple. They also describe the challenges faced in blockchain and their recent advancements. In this work deployment of smart contract is done over ethereum network which uses proof of Stake(PoS) but initially used PoW to overcome the challenges of the PoW.

The authors describe the history of blockchain, concepts included in blockchains like hash pointers, hash algorithms etc. in [1]. Also, they describe blockchain architecture, types of blockchains like permission-ed, permission-less. Then they describe different use-cases of the blockchain with respect to different permissioned and permissionless blockchain. In this work, we took into consideration the use-cases of the blockchain for the development.

III. SYSTEM DESIGN

Proposed system is a web application, which makes use of Solidity Application Binary Interface (ABI) code such that it can store the data of both professionals and customers which help in securing PII. Further details with respect to both customer and professional are stored in the MongoDB database. Using NodeJS we can

retrieve and store information, ReactJS helps in displaying the stored and retrieved information in an interactive webpage.

The block diagram in Figure 1 describes the proposed system of our work. The working of the platform is as explained below:

- **Register:** Here the user must register him with the required details. The system will validate the details given by the user.
- **Login:** User must login with valid username and password.
- **Search and Hire:** This functionality helps in finding professionals with respect to specific needs and hiring them.
- **Feedback:** This functionality helps customers to provide professional specific feedback.
- **NLP Model:** based on the feedback provided, the model gives the specific rating to the professional.
- **Document Verification:** This functionality helps the admin to verify details of professionals.

IV. IMPLEMENTATION

The implementation work is divided into different modules. The different modules being Blockchain module, NLP module and Web-App. Main focus of our work is that it is using blockchain to secure user's data which is their PII. Whereas the NLP module is being used to provide review based rating to professionals on the platform.

A. Blockchain Module

Recently there has been a lot of buzz around the word blockchain. Depending on the applications there have been rapid developments within a few years. Till now blockchain was only being used in cryptocurrency. However, recently researchers have discovered newer ways of implementing blockchain that could benefit with respect to security, immutability, availability etc. Considering the importance of data in the present time we considered storing the registration data in the blockchain, So that it can never be modified by anyone.

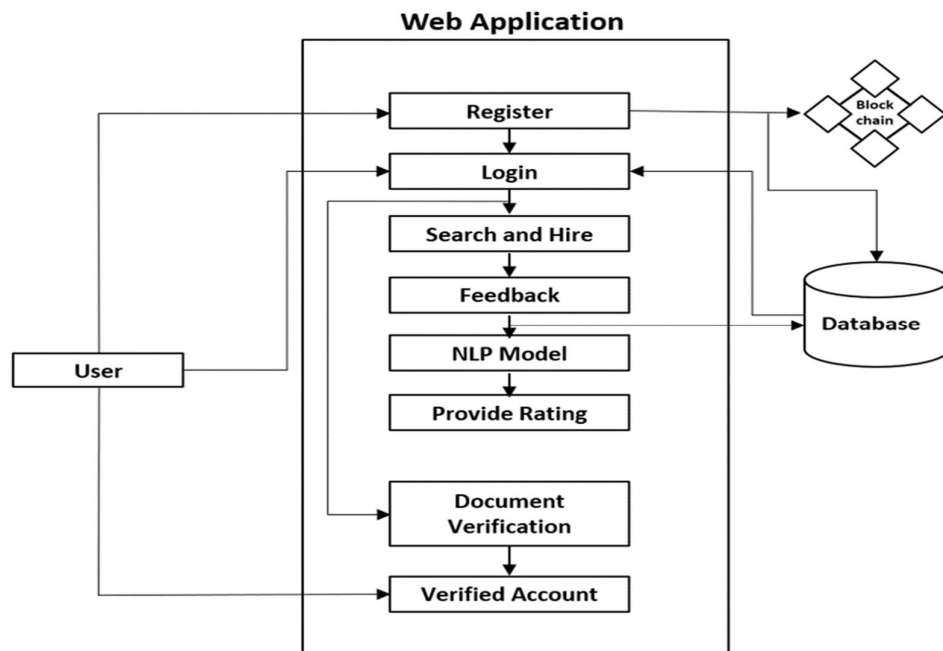


Figure 1. System Diagram

Smart contracts are created using solidity helps in storing data. The created smart contract when compiled, generate ABI code and the Ethereum Virtual Machine(EVM) bytecode. The ABI code specifies the functions and their functionalities with some parameters, whereas the EVM bytecode is used to deploy the contract over a network with the ABI code. Ether is nothing but the currency or money present in the account with respect to that distributed network. Ganache provider is used for importing a fake metamask account that has 100.00 ether to perform any sort of transaction. With the help of this imported account the application helps us in any sort of

signup with respect to either professional or customer, since blockchain uses some amount of money or ether for every transaction. In the application only the signup is used for transaction, based on the amount of data in the transaction the gas is used from the account that is provided from the ganache.

B. NLP Module

NLP is so pervasive today that we hardly notice it. When people use Alexa, they are conversing with an NLP machine; when a person types into a chatbot or search, NLP technology comes into fore. When using Machine Learning (ML) algorithms to extract data from documents, NLP is used once again. Similarly, in this work NLP is used to provide rating the professional with respect to the customer feedback. The given feedback is first sent to the TfidfVectorizer for processing, TfidfVectorizer determines how relevant a word in a series or corpus is to a text. The meaning increases proportionally to the number of times in the text a word appears but is compensated by the word frequency in the corpus (data-set). Then the preprocessed data is sent to the linear Support Vector Classifier(SVC), Linear SVC is used to fit the data provided, returning a "best fit" hyperplane that divides, or categorises, the data. After getting the hyperplane, features are fed into the classifier to see what the "predicted" class is. In this way rating the professional based on customer feedback using NLP is done.

C. Working

The landing page of the application briefly describes the application and its benefits. The login page of the application can be used by professionals and customers to register for the portal and also to login into the application. The user might be a professional or a customer. The credentials are validated for giving them access to the application functionalities. Figure 2 depicts the blocks created during registration with the help of the account provided by the ganache provider.

ACCOUNTS	BLOCKS	TRANSACTIONS	CONTRACTS	EVENTS	LOGS
CURRENT BLOCK 75	GAS PRICE 2000000000	GAS LIMIT 6721975	HARDFORK MURGLACHER	NETWORK ID 5777	RPC SERVER HTTP://127.0.0.1:7545
					MINING STATUS AUTOMINING
					WORKSPACE 7545
					SWITCH ⚙️
38	2022-04-29 01:32:07	121305	1 TRANSACTION		
BLOCK 37	MINED ON 2022-04-29 01:31:51	GAS USED 26653	1 TRANSACTION		
BLOCK 36	MINED ON 2022-04-29 01:31:13	GAS USED 26653	1 TRANSACTION		
BLOCK 35	MINED ON 2022-04-29 01:31:08	GAS USED 84253	1 TRANSACTION		
BLOCK 34	MINED ON 2022-04-29 01:30:49	GAS USED 23832	1 TRANSACTION		
BLOCK 33	MINED ON 2022-04-29 01:29:33	GAS USED 29187	1 TRANSACTION		
BLOCK 32	MINED ON 2022-04-29 01:26:58	GAS USED 61593	1 TRANSACTION		
BLOCK 31	MINED ON 2022-04-29 01:25:21	GAS USED 61461	1 TRANSACTION		
BLOCK 30	MINED ON 2022-04-29 01:25:16	GAS USED 61377	1 TRANSACTION		
BLOCK 29	MINED ON 2022-04-29 01:23:45	GAS USED 33370	1 TRANSACTION		
BLOCK 28	MINED ON 2022-04-29 01:23:31	GAS USED 32049	1 TRANSACTION		

Figure 2. Blocks created using the ganache provider

V. CONCLUSION

The work done is tested with a huge database of customers and professionals and is found to be working fine. It provides a platform for customers to get the required work done and for professionals to earn for their living. It is one of the applications which is very much useful for society in day-today-life. Since blockchain technology is

used to protect the data of both customers and professionals, one can register without any risk. This kind of platform is developed for the first time (to the best of our knowledge) and as a future work, the same platform can be extended to address the applications of similar kind like food-delivery, travel-bookings, e-commerce application and so on.

REFERENCES

- [1] Danda B. Rawat, Vijay Chaudhary and Ronald Doku, "Blockchain Technology: Emerging Applications and Use Cases for Secure and Trustworthy Smart Systems", *Journal of Cybersecurity and Privacy* 2021, Vol. 1, pp. 4–18.
- [2] Thomas kitsantas, Athanasios Vazakidis, Evangelos Chytis, "A Review of Blockchain Technology and Its Applications in the Business Environment", *International Conference on Enterprise, Systems, Accounting, Logistics & Management*, GREECE, July 2019.
- [3] Zibin Zheng, Shaoan Xie, Hongning Dai, Xiangping Chen, and Huaimin Wang, "An Overview of Blockchain Technology: Architecture, Consensus, and Future Trends", *IEEE 6th International Congress on Big Data*, 25-30 June 2017, USA.