

# Problem Description

- 1) Health insurance in India is a growing segment of India's economy. In 2011, 3.9% of India's gross domestic product was spent in the health sector.
- 2) Currently, each insurer in India commissions separate medical tests for potential customers. This increases the total expenses incurred by the insurers.
- 3) Problem of customers defrauding insurers by:
  - a) Billing for services not rendered
  - b) Upcoding of services
  - c) Upcoding of items
  - d) Duplicate claims

# Problem Description

A) Billing for services not rendered:

Billing insurers for fake medical claims.

B) Upcoding of services:

Billing insurers for services that are more costly than the actual procedure that was done.

C) Upcoding of items:

Similar to upcoding of services, but involving the use of medical equipment.

D) Duplicate claims:

In this case a provider does not submit exactly the same bill, but changes some small portion like the date in order to charge Medicare twice for the same service rendered.

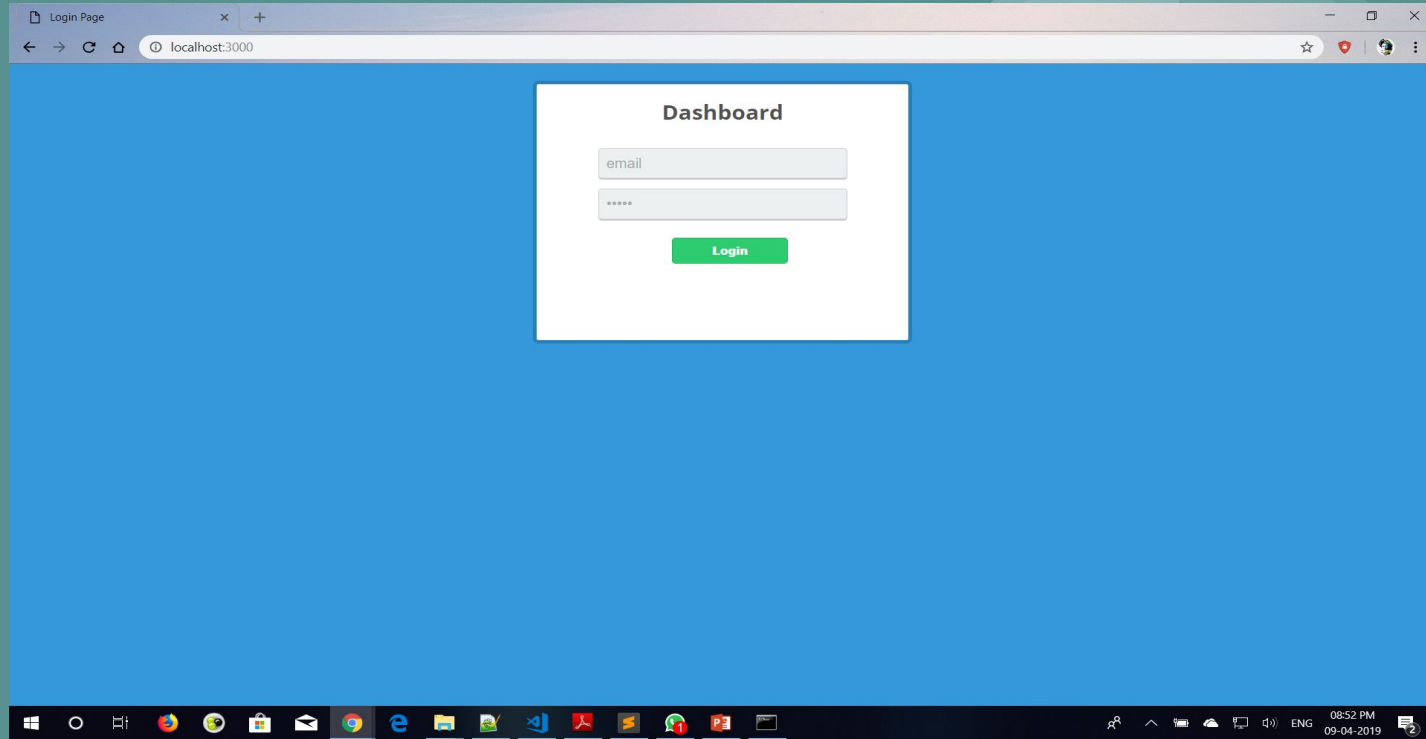
# Proposed Solution

1. Blockchain can be used to store and share medical records and to enable fast approval or denial decisions. This means lower costs for insurers as one medical examination would be now enough for all insurance providers involved in the project. The medical records of insurers would be saved and accessed, which will allow swift data sharing without compromising on security aspects.
2. Hospitals and medical dispensaries can upload the medical bills of the customers to the blockchain which will maintain a digital ledger of all the transactions involved. The insurers can therefore access the data and can easily verify the authenticity of these claims.

# Functionalities

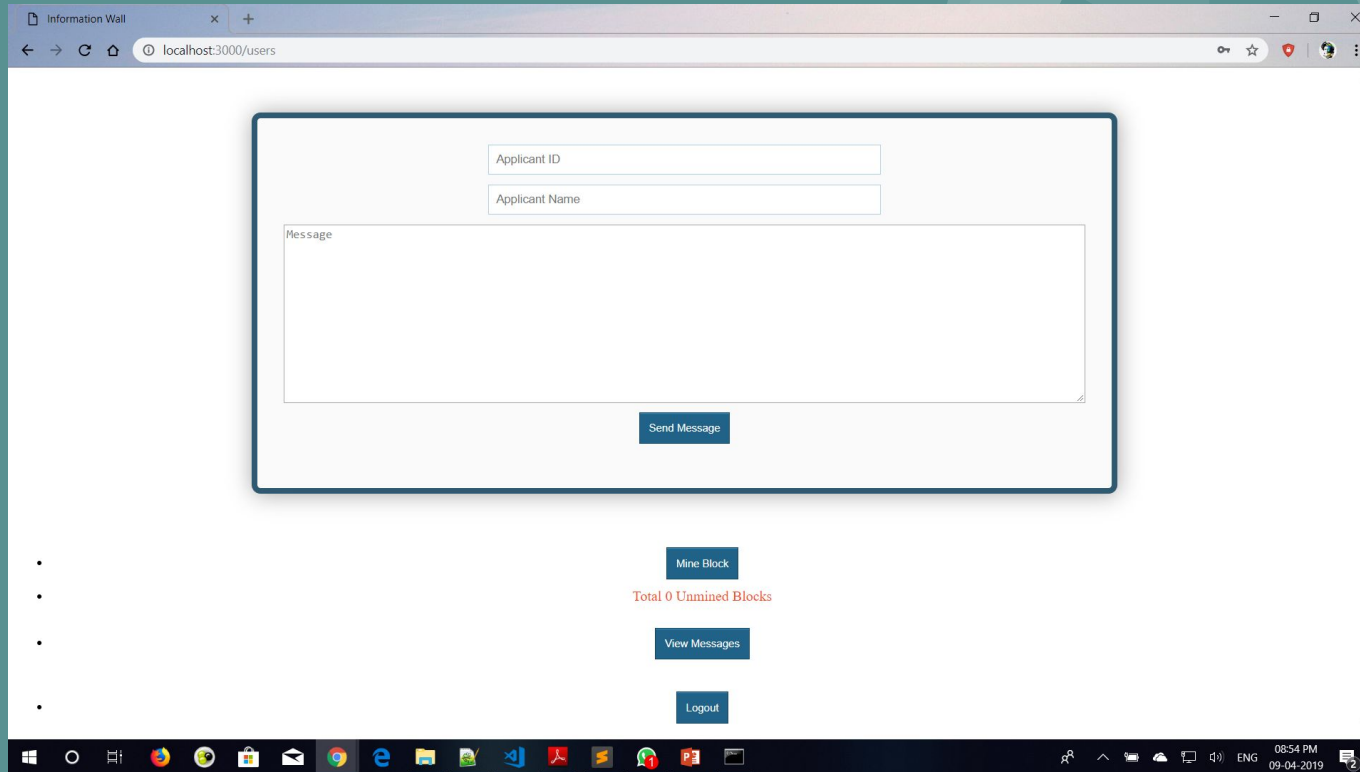
1. User can sign in to the application using a username and a password
2. The users are predeclared, hence a new user cannot be added directly from the application UI.
3. After logging in User will come across the message board (i.e. the data of the blocks in the blockchain)
4. User can create a new message which will create a new block
5. The block can be mined (i.e. added to the blockchain) using the Mine Block functionality provided in the application
6. Proof of Work concept has been used with difficulty set to 4 to increase the duration of mining a block into the blockchain

# 1. User details are stored in Mongoddb database



Users are directed to the message wall after logging in

1. In this page users can see the contents (data) of the existing blocks in the blockchain, and add new blocks using the “Send Message” option provided in the UI of the application.



# An Example Message

Information Wall

Sample Letters to Use with Insur

aadhar number example - Goog

+

localhost:3000/users

768523981342

Mukesh Kumar

Request that the copay for the psychiatrist from the patient be changed to a medical copay rate instead of the higher mental health copay, because the psychiatrist was providing medication management, not psychotherapy.

Outcome: Adjustments can be made so that the family is billed for the medical copay. Remember, the psychiatrist must use the proper billing code.

Send Message

- 
- 
- 
-

Mine Block

Total 0 Unmined Blocks

View Messages

Logout

08:55 PM  
09-04-2019

Number of blocks yet to be mined is notified to the user (Count is displayed under the Mine Block option)

The screenshot shows a web browser window with the address bar displaying `localhost:3000/users/block`. The browser tabs include "Information Wall", "Sample Letters to Use with Insur...", and "aadhar number example - Goog...".

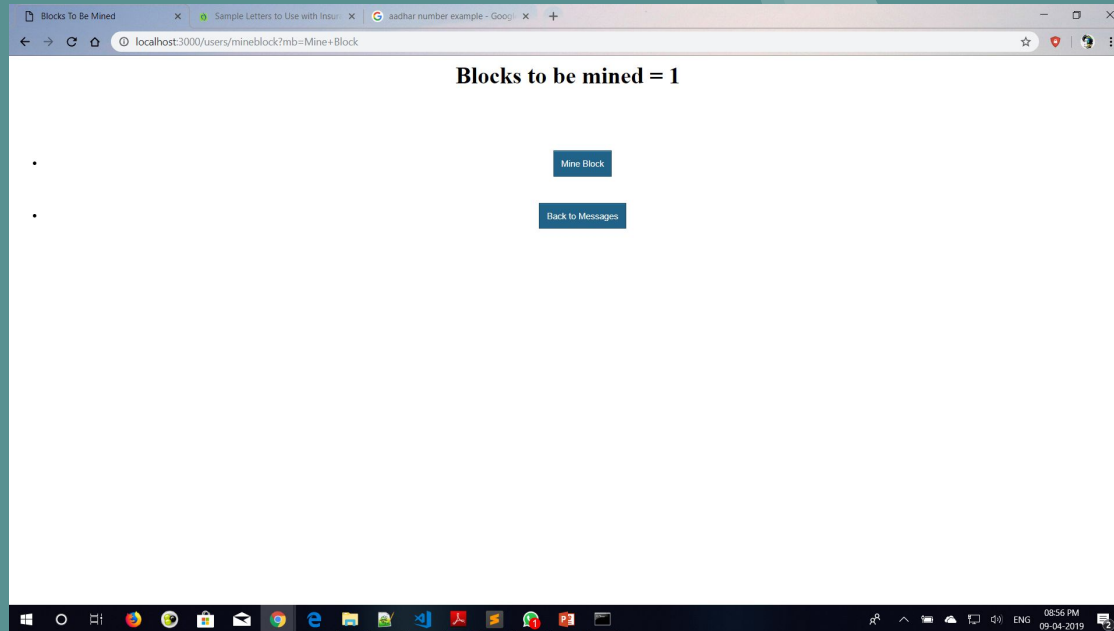
The main content area features a large form with a dark blue border. Inside this form, there are two input fields: "Applicant ID" and "Applicant Name", followed by a larger "Message" text area. A "Send Message" button is positioned at the bottom right of the form.

Below the form, there is a "Mine Block" button. Directly underneath it, the text "Total 1 Unmined Blocks" is displayed in red. Further down, there is a "View Messages" button, and at the very bottom of the main content area, a "Logout" button.

The Windows taskbar at the bottom of the screen shows various application icons, including the Start button, File Explorer, Google Chrome, and others. The system clock in the bottom right corner indicates the time is 08:56 PM on 09-04-2019.

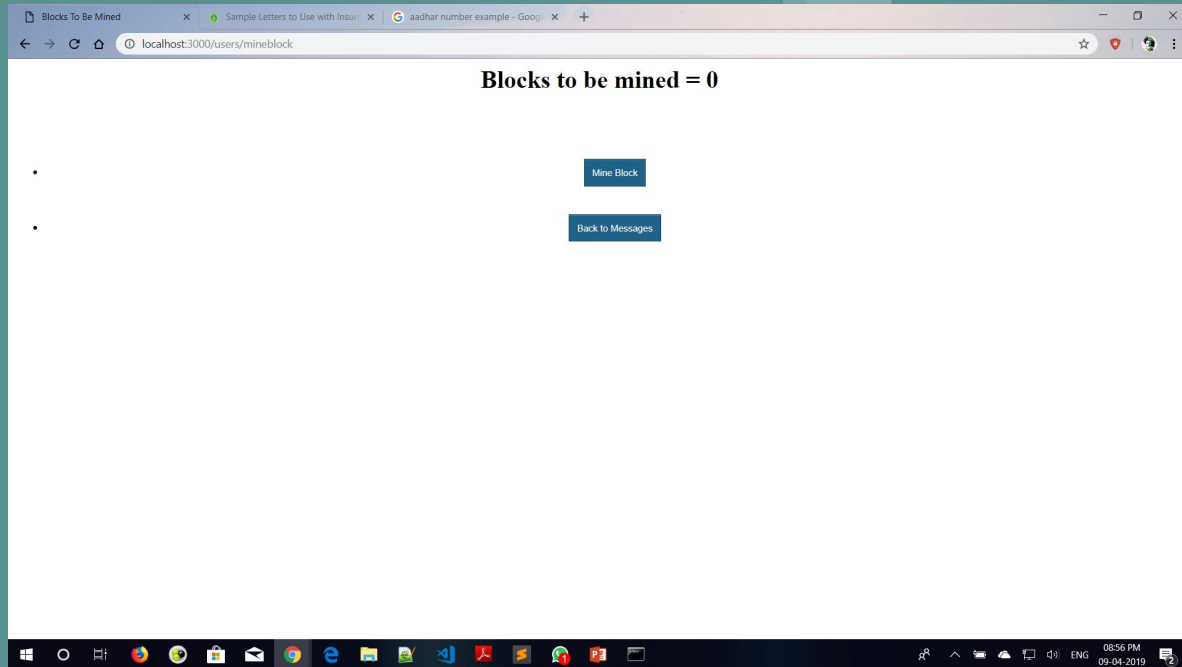


Mine Block button (option) redirects to the mine-block interface. Clicking “Mine Block” here adds the block to the blockchain. User validation using zero knowledge proof and proof of work to mine the block are used to maintain the integrity of the blockchain. Furthermore, the validity of blockchain is checked before the addition of a block.



(Continued)

The count of pending blocks to be mined is also maintained to ensure no block is delayed. Furthermore, a first come first serve approach is followed in scheduling the mining of these blocks



The “View Messages” option in the UI carries out the “viewuser()” implementation, i.e., it displays the transactions made by that particular user.

