# Suraksha: Health Insurance Claim Analysis Web Portal

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## Abstract

*The arrival of the digital era has made almost all the sectors of a country paperless. The Internet is used to grow the business and is also used to ease out the various processes which were earlier considered to be tedious. Most of the banks, financial institutions, government etc. have reduced over the window transactions and emphasize on online transactions. This has aided in keeping a thorough record of various transactions and has improved the efficiency tremendously. Most of the insurance companies are offering policies online and the premium can also be paid without the involvement of any third party in between. This saves time and allows both ends a hassle-free experience. Nowadays, most of the health centres or hospitals have started using the same digital techniques in-order to maintain the records of patients and their health insurance policies. The proposed system focuses on the digitization of the health and insurance sector which will reduce the burden on the patients and make it easy for the various other stakeholders to analyze and process them simultaneously. The analysis will be based on the criterions such as age, gender, hospital, status of remittance advice across various hospitals of various countries in different years etc. With the analysis we aim to identify the strata which meet our criterion i.e. whose remittance advice is rejected.*

*Keywords: Digital transactions, Health insurance, stakeholders, claim analysis, machine learning*

## 1. Introduction

Digitization has entered all the sectors of a country and it has proved to be hugely beneficial for everyone, we have just recovered from an ugly covid pandemic and now more and more people are going for health insurance. [1-4] The Figure 1 shows in graphical form that there is a fall in the number of people without health insurance from 2008 to 2021 in the United States. According to India's Health Insurance Market Report 2022-2027 shown in Figure 2, statistics define that the changing lifestyle has compelled people of all strata of society to buy health insurances. Industry set to reach $198.45 Billion at a CAGR of 10.2%, statistics as per the article published in globalnewswire.com and it echoes the voices of Millions of people.
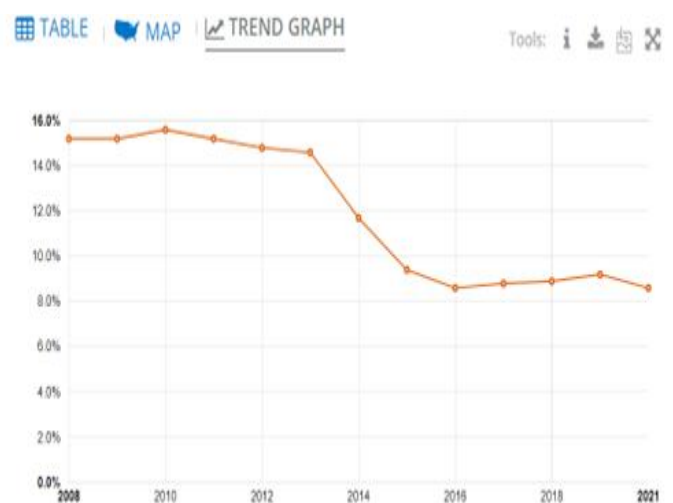


**Figure 1** Trend of The Number of People with Health Insurance in The US (KFF.Org)
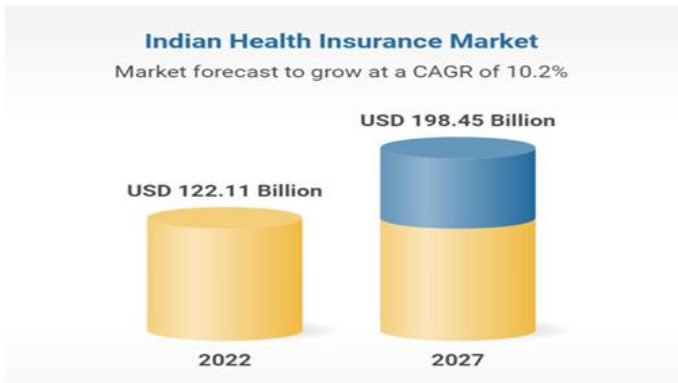
**Figure 2** Forecast of Growth of Health Insurance Market (Researchandmarkets.Com)

Not only the USA but almost all countries are witnessing such a change in trend, but there are still certain things that have to be taken care of such as presently in order to claim the health-insurance, there are a lot of formalities to be done from the claimer's side and it is quite tedious for him. The present situation also involves submitting a hard copy of the document and communication [5, 6] with the hospital where the patient is admitted. The insurance companies have made the process of buying the insurance quite easy and it is completely online. But the same is not true for the purpose of claiming as the

portals formed are quite disjoint. It would be very easy for the claimer to claim insurance once this entire process shifts to a single platform online mode. The involved stakeholders can easily authenticate the documents and revert back using a single portal and make it a very speedy process. As more and more people are using the internet, it would be very useful if such a [7] common portal exists as it would save time and make it less tedious for the patient. The section 2 of the following paper depicts the literature survey and its comparison to the present system, section 3 describes the working flow and methodology of the proposed system. Section 4 consists of the implementation details along with their results and analysis of the research and finally in section 5, the proposed system is concluded with future scope of the system. [8]

## 2. Experimental Methods or Methodology

From Figure 3, the proposed system is defined for 3 major stakeholders such as the health center, the government authority and the insurance company itself. The flow of data is initiated by the health center and is obtained by the government authority which then sends the required documents to the insurance company and the insurance company starts the confirmation proceedings. [9]
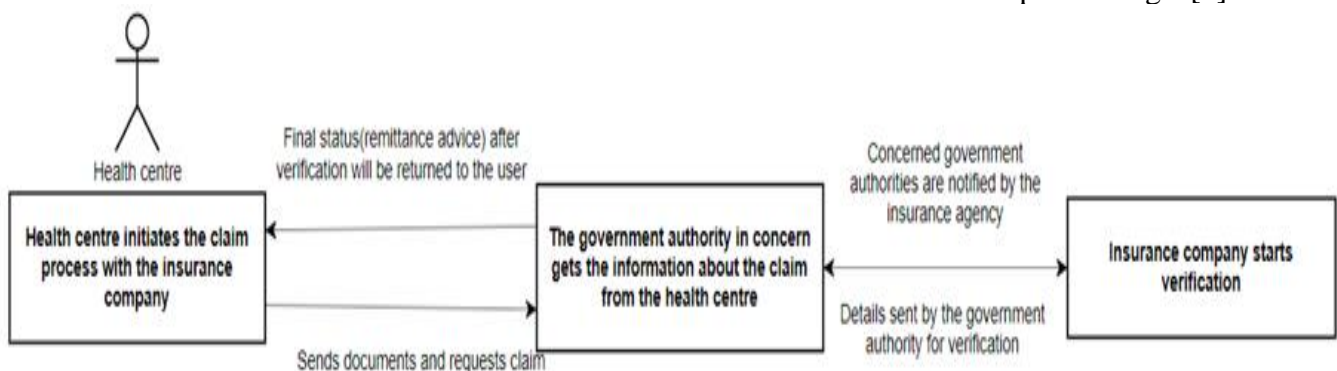


**Figure 3** Block Diagram for Proposed System

**From the above Figure We get 4 main layers:**

- Presentation layer will be the front end of our system, it will display the important news, provide the admin interface, and also contain the FAQ section inorder to help the users. [10]
- The abstract boundary that a service exposes is Analogous to the service interface. It outlines the different message kinds, message exchange patterns, and any conditions those message types may imply for using the service. Modular Diagram of proposed system shown in Figure 4.
- The system's primary functions include

enabling user login and granting them access to modify their profiles and see dashboards. From a management viewpoint, these functions include ensuring compliance and analysing the data gathered. [11]

- The maintenance of the database that stores all the submitted data as well as the services and

security features offered to the stakeholders make up the back-end layer. The modular diagram further divides [13] the block diagram into the actions performed by each stakeholder i.e., the management activities permitted, the functionality of the portal, the presentation view and the service interface.
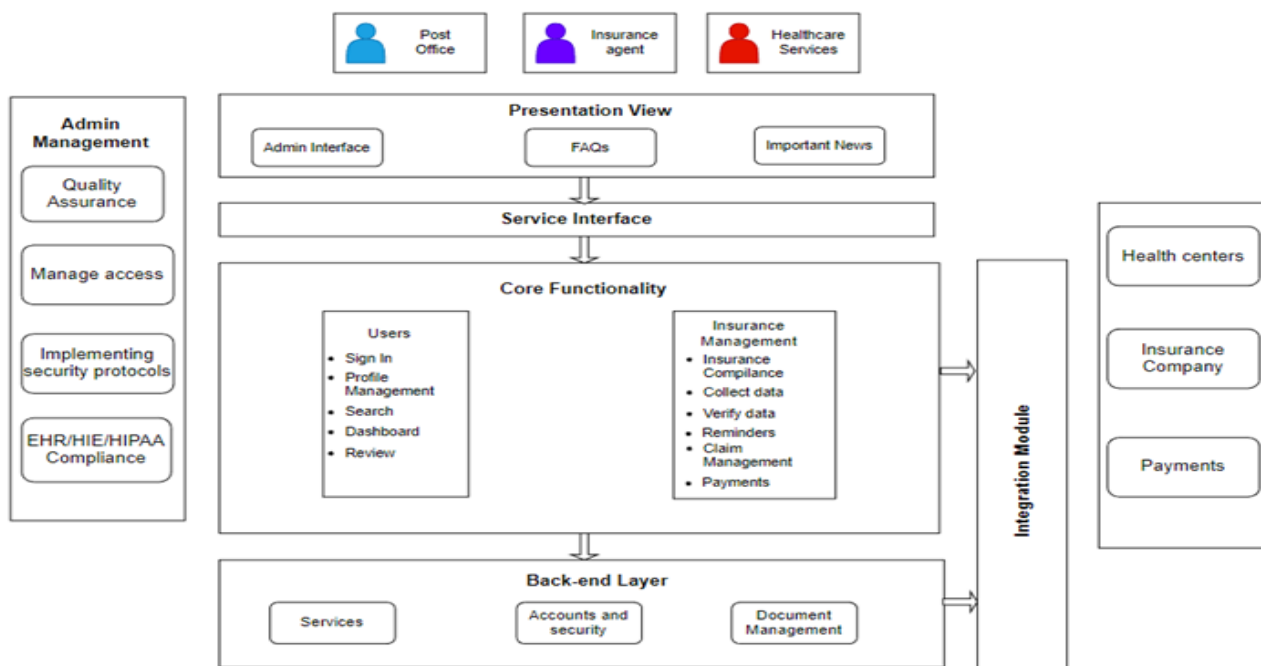


**Figure 4** Modular Diagram of Proposed System

### 2.1 Methodology

**Phase1:** First, we did a thorough study of the policies of insurance used in different parts of the world such as EHR and HIPPA. A federal legislation known as the Health Insurance Portability and Accountability Act of 1996 (HIPAA) mandated the development of national standards to prevent the disclosure of sensitive patient health information without the patient's knowledge or consent. A patient's paper chart gets converted to digital form in an electronic health record (EHR). EHRs are patient-centered, real-time records that securely and promptly make information accessible to authorized users. This was done to keep the distinctive characteristics of each country's procedure while also gaining visibility into the factors that would be used in the study. [12]

**Phase 2:** Next we had to identify the various actors and stakeholders involved in the project and also we needed a complete understanding of the process requirements in order to develop a robust system,for this we had a discussion with the industry expert regarding the same. [14]

**Phase 3:** In any project there is a need to understanding the functional and non-functional Requirements as these parameters have to be determined right at start in order to have a risk free project, so we brainstormed and fetched these requirements. [15]

**Phase 4:** The next step was integrating and warehousing all the required data.

**Phase 5:** After having done a thorough literature survey we began to construct a prototype of our

project, we developed a rough front end estimate of what the portal might look like we also built a prototype in figma indicating the same.

**Phase 6:** The next phase included implementing the necessary backend, especially isolating the services provided to the different stakeholders.

**Phase 7:** After preparation of the data, the next step was analyzing it. We uploaded the analysis results on a public cloud platform so that it can be accessed by anyone. Analysis was done on the visualization tool Tableau and Tableau Public was used to host the results. Portal implementation process shown in Figure 5, 6 and 7. [16]
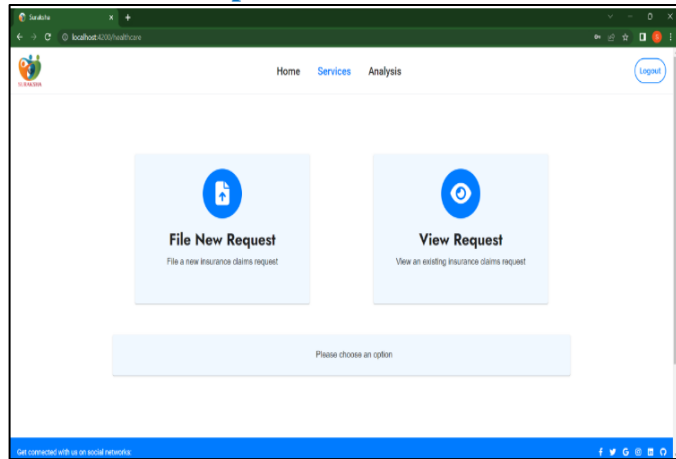
## 3. Results and Discussion

### 3.1 Portal implementation
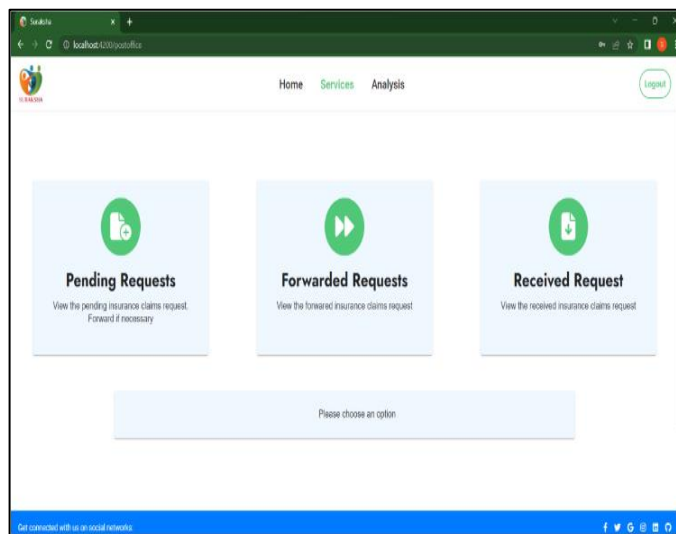


**Figure 5** Healthcare Center Services Page



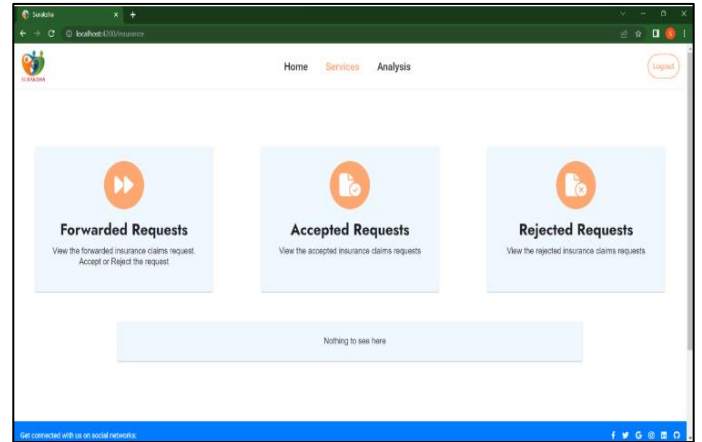**Figure 6** Post Office Services Page



**Figure 7** Insurance Company Services Page
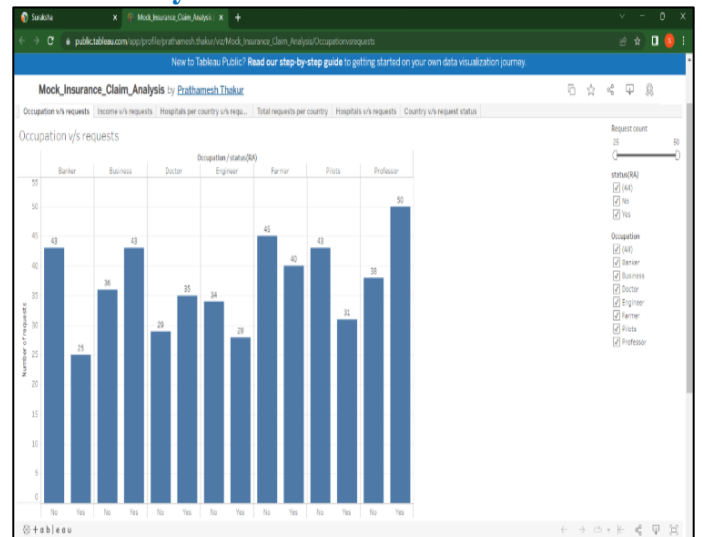
### 3.2 Analysis



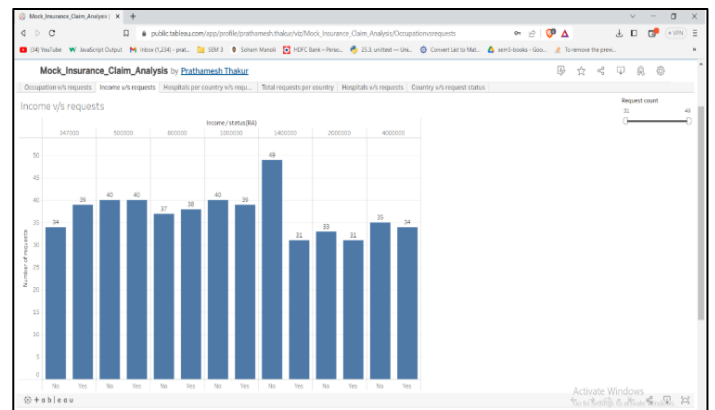**Figure 8** Comparison Between Status of Application and Occupation of Patient



**Figure 9** Comparison Between Status of Application and Income of Patient

We could infer the following from the analysis of our sample data set.

- Comparing the status with respect to occupation the highest approval status is for Professors i.e. 50 and lowest is for Bankers i.e.25
- The maximum rejected applications belong to the group of Farmers i.e.45

With respect to income as the criteria for status we observe the following:

- The highest approval rate is for people with income of 500000 meaning most of the people earning a salary of more than 5 lakh or atleast 5 lakh are approved to claim.
- The highest rejection rate is observed for people with 140000 lakhs as income.

Now comparing the hospitals and the requests received from them we get:

- Jupiter hospital has maximum applications in India and UAE which means that the process for patients must be pretty smooth due to which maximum patients are applying for claim
- Whereas Zen has the highest applications in the USA.

We can also conclude from the data that India has the highest number of insurance claims initiated as compared to the UAE and the USA. Moreover, the maximum rejection percentage of applications follows the order of UAE then India, and least rejection is from the USA, this concludes two possible things it might be that the system to claim insurance needs improvement in UAE and India and that the patients need to be taught and made aware of the form filling procedures to avoid making errors. Analysis process is shown in Figure 8,9.

## Conclusion

The pandemic has highlighted the need for a faster and more efficient process for insurance Claim filing. Our portal provides a common platform for all involved parties in the Insurance Industry and regulating the verification process based on relevant parameters can significantly streamline the claim filing process. This would not only help patients receive timely medical care but also ensure that insurance Companies can process claims more effectively. Overall, improving the claim filing process Can help provide better healthcare access to all individuals and ultimately contribute to the Betterment of society.

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