

# Social Health Authority (SHA) FAQ Chatbot

Leveraging artificial intelligence(AI) in healthcare.



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# OVERVIEW

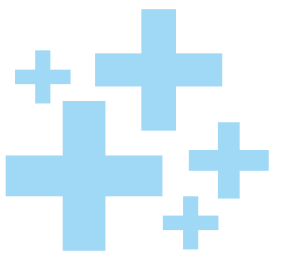
Imagine a future where every Kenyan citizen can easily access crucial health insurance information, anytime, anywhere. The Social Health Authority (SHA) FAQ Chatbot aims to make this a reality.

By leveraging advanced conversational AI, this chatbot will provide instant answers to questions about SHA policies, registration processes, and healthcare benefits.

**Objective:** The project aims to develop a Frequently Asked Questions (FAQ) chatbot to address this issue, providing real-time, accurate information thereby supporting the successful implementation of healthcare reforms.



# BUSINESS & DATA UNDERSTANDING



**Problem Statement:** The primary challenge is the lack of accessible, user-friendly information about the Social Health Authority (SHA) in Kenya. This information gap hinders effective communication about healthcare reforms, SHA benefits, registration processes, and policies, limiting public awareness and engagement.

**Data Source:** The primary data source for this project is a PDF document containing FAQs related to SHA, sourced from the Kenya Healthcare Federation (KHF) and developed by the SHA Transition Committee with support from USAID as well as the SHA website.

# TARGET AUDIENCE

- **Kenyan Citizens:** Individuals who need accessible information about the Social Health Authority (SHA) processes, benefits, and policies.
- **Healthcare Providers:** Medical professionals who require clarity on SHA regulations and benefits to better serve patients and create mass awareness.
- **SHA Customer Service Teams:** Teams responsible for addressing public inquiries will benefit by having a reduced workload due to the automated handling of basic queries.



# DATA PREPARATION

Initially, the dataset was in PDF format. We extracted the data into a CSV file to make it easier to work with.

## **Data Cleaning** involved:

- Converted all text to lowercase to treat similar words uniformly, regardless of capitalization, e.g "SHA" and "sha" would now be seen as the same, making the data more consistent and easier for the model to understand.
- Removed punctuation and symbols to simplify questions, while retaining important years.
- Eliminated duplicate questions to focus on unique information, improving training quality and efficiency.

All this was done in order to allow the chatbot to better understand user queries.



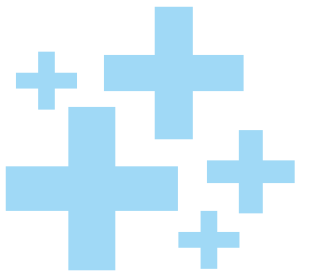


# MODELING

We used **Rasa**, an open-source conversational AI framework, to develop our FAQ chatbot. The modeling process focused on creating a Natural Language Understanding (NLU) model that could effectively classify user questions and extract relevant information for precise responses.

Why  ?

- **Flexible and Adaptable:** Rasa allows the chatbot to understand a wide range of questions, whether they are simple or complex.
- **Community Support:** Rasa is an open-source tool, which means it has a large community that continually improves its capabilities, making it perfect for a public project like ours.



## How the chatbot understands questions:

- **Identifying the Type of Question (Intent Classification):** The chatbot uses Rasa to determine what the user is asking about, such as information on registration, benefits, or policies. From our dataset we created as many variations as possible of the available question to aid in model training.
- **Finding Key Information (Entity Extraction):** The chatbot also picks out important details, like names or dates, from the question to give the most accurate answer possible.

## Dialogue Management:

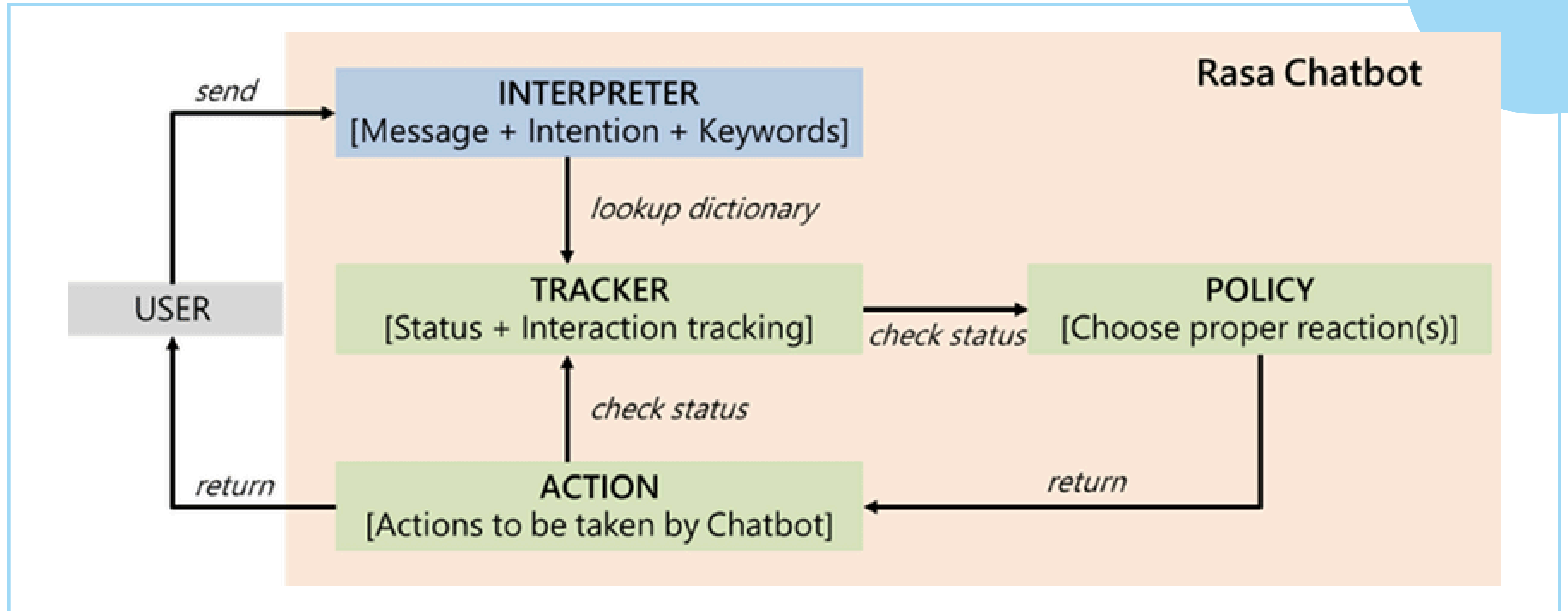
- **Rule-Based and ML Approaches:** To manage the flow of conversation, we combined predefined rules with machine learning models. Rules help guide structured dialogues, while the machine learning component adapts to less predictable questions.







# Flowchart





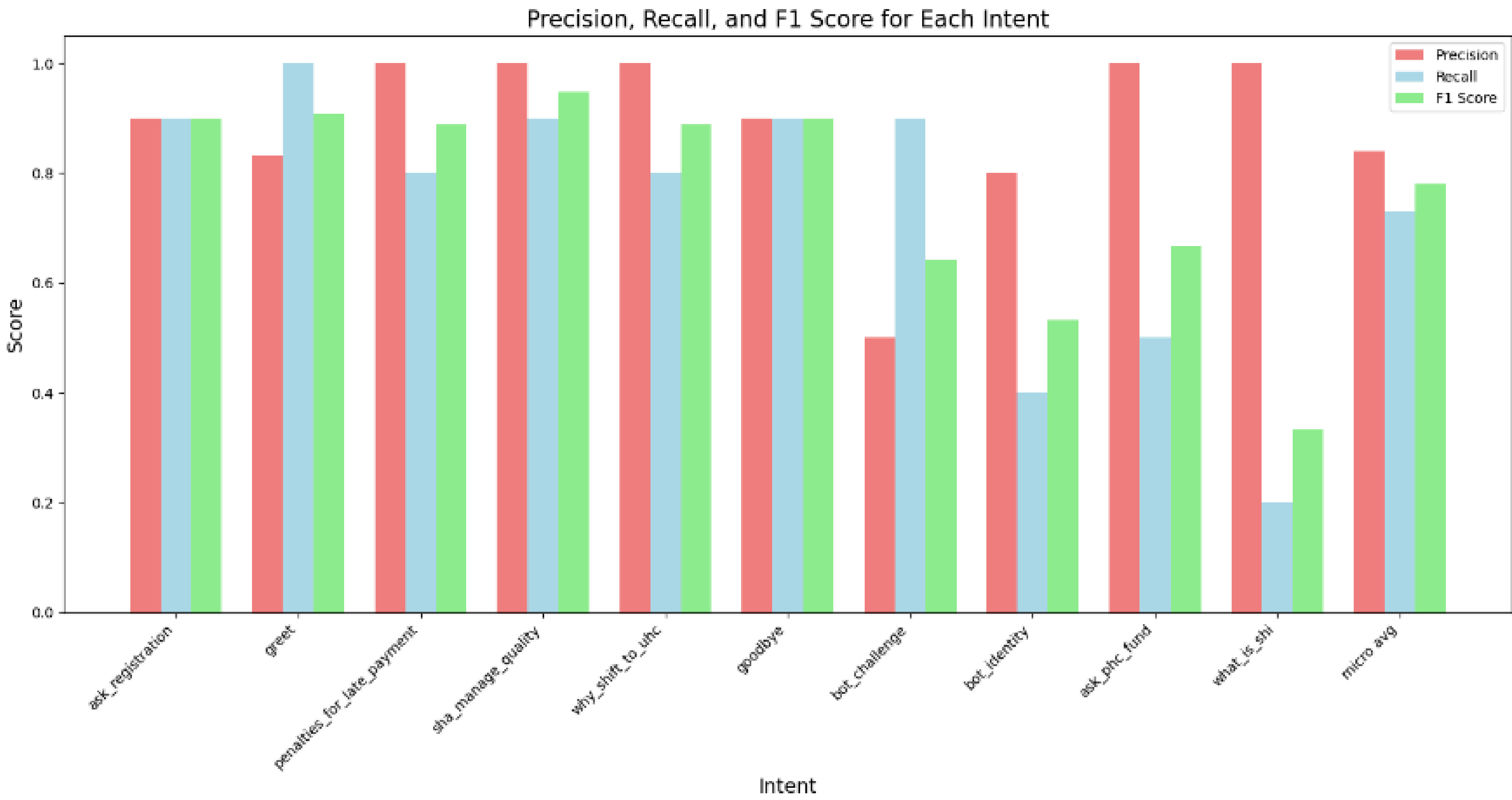
# EVALUATION

Below are the evaluation metrics used to determine our model and intent evaluation:

- **Accuracy:** Indicates how well the chatbot correctly classifies user intents.
- **Precision, Recall, F1-Score:** These metrics provide insight into how well the model distinguishes between different user intents.
- **Intent Classification Accuracy:** Measures the success rate of the chatbot in understanding user intents, ensuring accurate responses are delivered.

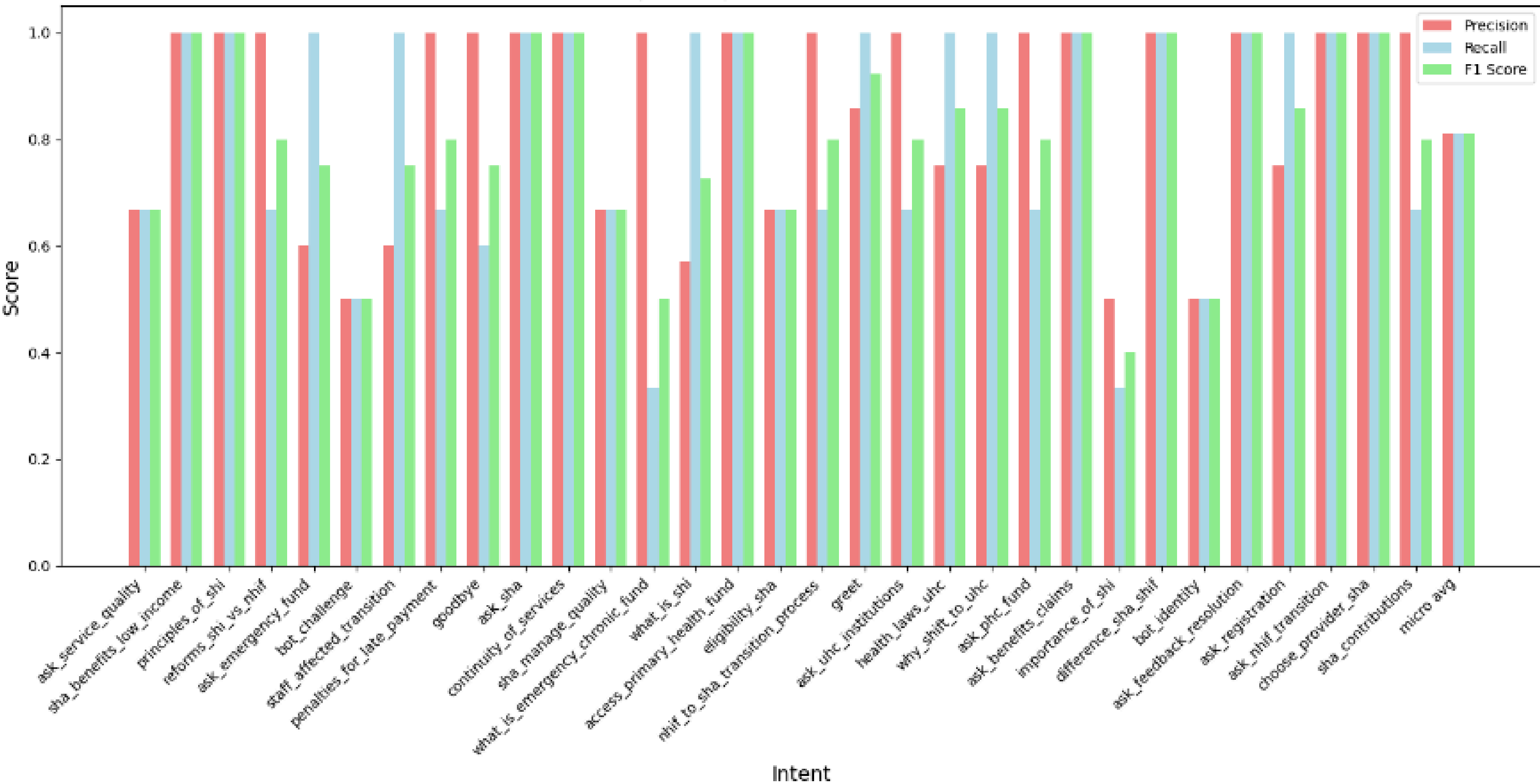
**Results:** The model with more intents performed better at correctly classifying the user's intents than the one with fewer intents, with an **Overall Model Accuracy** of **81.19%** and **73.00%** respectively.

Overall Model Accuracy: 73.00%



Overall Model Accuracy: 81.19%

Precision, Recall, and F1 Score for Each Intent



# DEPLOYMENT

To make our chatbot accessible to users, we used a simple setup that connects it to the internet through a tool called **Ngrok**. The chatbot is available via a web page, allowing users to easily type their questions and get answers directly in their browser.

- **How It Works:** We set up a Rasa chatbot and used Ngrok to create an internet link that connects to the chatbot running on our local system.
- **Web Page Interface:** We made a simple webpage where users can type questions and receive instant responses from the chatbot. This makes it easy for anyone to use, without needing extra software.
- **Outcome:** This setup allows us to quickly make the chatbot available for use and testing, providing a smooth way for users to access healthcare information through their browser.



# Social Health Authority Ke Bot

**Bot:** I am an automated assistant here to answer your questions about SHA, UHC, and healthcare in Kenya.

**You:** are you an AI?

**Bot:** I am a virtual assistant designed to help you with questions about healthcare in Kenya.

**You:** WHY DID KENYA SHIFT TO UHC?

**Bot:** The shift to Universal Health Coverage (UHC) was necessary to ensure all Kenyans have access to quality, affordable, and comprehensive health services without financial hardship. It promotes equity and provides access to healthcare for vulnerable groups.

Type a message

Send





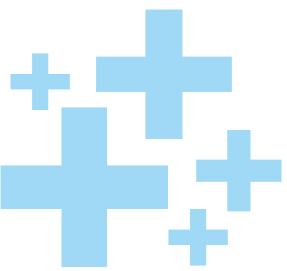
# CONCLUSIONS & RECOMMENDATIONS

- The project has successfully achieved its objective towards bridging the information gap in Kenya's healthcare system. By providing timely and accessible information, the SHA FAQ chatbot represents a significant step in empowering citizens, healthcare providers, government staff, and SHA customer service teams to understand more effectively SHA processes.



## Recommendation:

- **Expand Data Sources:** Incorporate more data, such as updated FAQs and government bulletins, to enhance the chatbot's accuracy and relevance.
- **Language Support:** Add multi-language support to cater to diverse users.
- **Periodic Content Updates:** SHA should regularly update the chatbot's FAQ content to align with any changes in policy, services, or frequently asked questions. This will keep the chatbot's responses accurate and relevant.



# NEXT STEPS

- **User Feedback Integration:** Continuously collect user feedback to identify challenges and improve chatbot capabilities.
- **Expand Training Data:** Incorporate more real user questions to expand and diversify the training data, improving the chatbot's ability to understand and respond accurately.
- **Ongoing Monitoring and Maintenance:** Regularly monitor performance and update the chatbot to keep it effective and relevant.



# THANK YOU!

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