PoliceBOT- An Informative RASA Powered Chatbot based Crime Registration and Crime Awareness System

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Abstract -*Chatbots are computer programs that converse with a user. Here we propose a crime registration and awareness web portal, which is empowered by a Chabot for user/victim's assistance and awareness. Our chatbot-based web portal provides a platform for registering crime, getting information about various types of crimes and it can collect various verification documents from the victims so that the authorities could cross-verify the information provided. It has several online forms for registering complaints which may act as supplementary sources of information for the authorities in order for them to take prompt actions based on the information provided. It is a secure platform that is connected to a database that only takes unique user credentials. It aims to provide an integrated system while retaining the original characteristics of the existing systems (for example Registration of FIR for heinous crime).*

***Key Words*:** Chatbots, RASA, Web portal, complaint registration, Crime awareness

1. INTRODUCTION

Chatbots are computer software that is made to assist humans and have a one-on-one conversation with them [1]. There has been a boost in the usage of chatbots for various applications ranging from E-commerce websites to booking tickets for an event. Chatbot usage has boomed across various industries, today more than a billion people use chatbots worldwide daily [2].
However, to date chatbots are not used by police authorities to a large extent.

Cybercrime is a crime that is committed online, which targets to bring losses to an individual or an organization. Cybercrime has become prevalent in modern society [3]. Despite the extent of cybercrimes, nearly half of the Indian population don't know how to shield themselves from being a victim of cybercrime. Thus, bringing in a need for a system that caters to this issue and spreads awareness about various types of cybercrime.
In India, a missing person investigation can't be set up before 24 hrs of that person deemed missing. This can be problematic in many cases when the peers of the missing person are confident that the individual in question may have been abducted, the authorities won't be able to start the investigation within 24 hrs in these serious cases as well. Thus, a system that can act as promptly as possible and help the authorities to know about the details of the missing person beforehand could be of great help [4].

Thus, we propose a model to help in resolving the above issues. This project aims to create a website(portal) assisted by a user-friendly chatbot for crime registration, ranging from crimes like dowry, various types of cybercrimes, etc. to missing person's reports. It aims to provide an integrated system while retaining the original characteristics of the existing systems in place. Our system can help in solving the underlying cases-

1. The police cannot arrest without a warrant for non-cognizable offences [5], such as bigamy or defamation, and so cannot file a FIR before the legal procedure;

This chatbot-based website can help in reducing this time by assisting in the gathering of useful information from the victim beforehand.

2. In many cases people hesitate to file their complaints in a police station, this user-friendly chat bot-website-based system will interact with them and ease them up.

3. Sometimes people don't find crucial information like emergency contact numbers, the category of crime they faced, etc. This chatbot will help them out.

4. In many circumstances, families can take essential action if they are informed of the missing person's condition in a timely manner; this may be accomplished with the assistance of our chatbot, which will result in prompt action.

2. RELATED WORK

We have gone through several papers relating to our project and also looked for different chatbot applications available online.

In this paper a system is made for getting quick information on Diseases it is an intelligent customer query response agent, it is made using RASA NLU [6]. The built system uses the RASA framework to detect the level of stress in an individual and classify it into different categories based on user responses [7]. The built system has a deep learning-based chatbot application that answers health-related questions of users, it uses word stemming and Bag of Words model [8].

Watson Assistant is a platform which is powered by Artificial Intelligence, which is used to build platform-independent chatbot applications [9]. Google Dialog Flow is another tool that helps in bypassing all the hard coding because it uses NLU and provides a platform to integrate conversation interfaces with ease [10]. Azure Bot service is another service that helps in developing chatbots, it has support for various channels like Facebook, Twitter, etc [11].

3. SYSTEM SPECIFICATION

Our system which is presented in the paper has the following specifications-

- The user can access the website through any web browser. FLASK framework [12] is used.
- The user is provided the option to submit verification documents like Aadhar Card, PAN Card, etc. so that the authorities could cross-verify with the data provided and check for the authenticity of the user/victim.
- The user can register to access the chatbot-assisted main webpage where complaint registration could be done. This is stored in a MongoDB Database.
- The site is built using frontend coding languages like HTML and CSS.
- The chatbot is powered by the RASA framework [13]
  which assists the user to register crime as well as provides information and description about the crime selected.
- AJAX calls are sent to the server which results in increased speed of response from the chatbot. The user need not wait long for getting responses from the chatbot.
- The user has the option to fill complaint forms which are sent to the authorities.
- The user gets a copy of their responses well.

3. SYSTEM ARCHITECTURE

Figure1 shows the work model of the chat-bot assisted web-portal. The working model is described below.

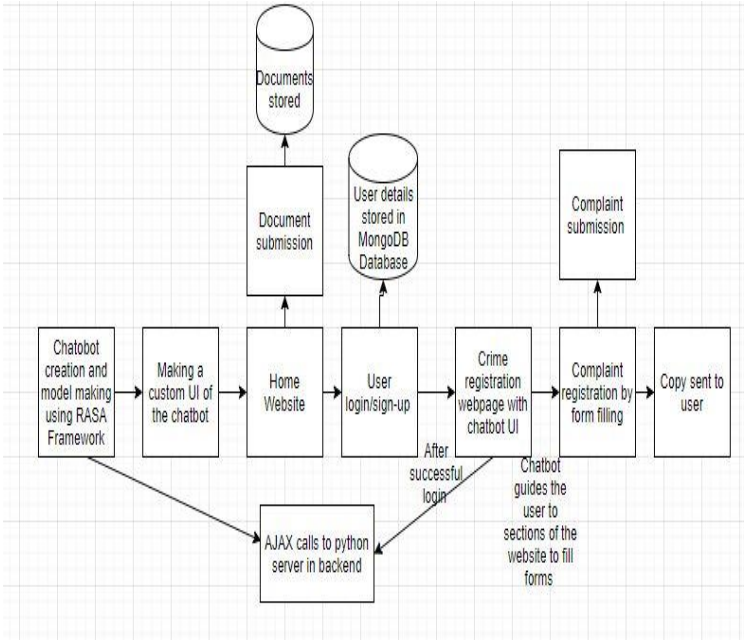

Fig 1: Work model of our system

3.1 Home page

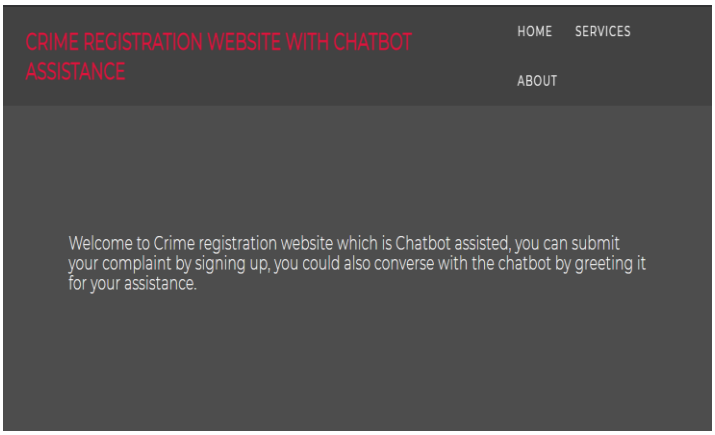

Fig 2: Home page of crime registration website

The first page of the site contains links to sign-in/ register, it also contains links to upload verification documents (Aadhar Card, PAN Card, or Voter Id Card) so that the authorities could verify the person who is uploading the complaint.

3.2 Services Section

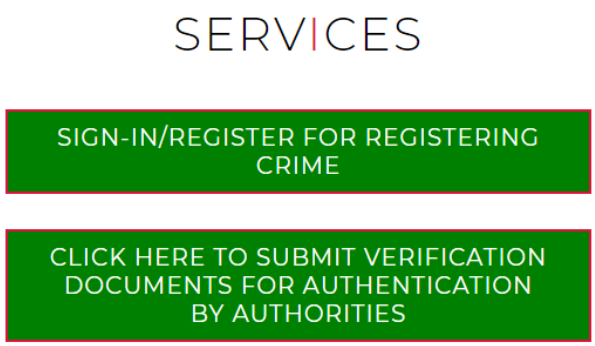

Fig 3: Services section of the website

In this section, we have an option to Sign-in/Register to register our complaint. We also have the option to upload verification documents so that the authorities could cross-verify the users for protection from potential scammers and fraudulent people accessing the site.

3.3 Verification documents submission

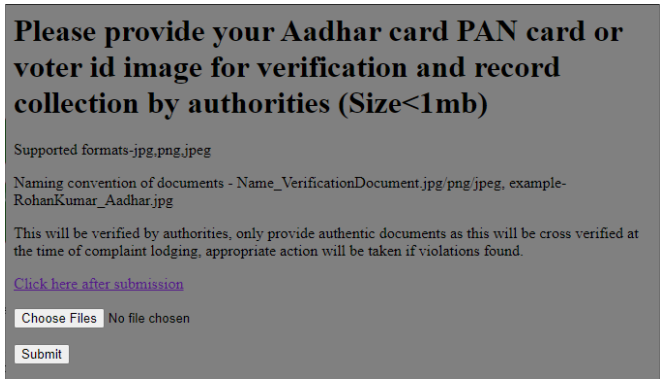

Fig 4: Document submission page

Here we collect verification documents from the users before directing them to the main site of Police-BOT so that this information could be collected by the authorities and the users could be cross-verified for security purposes.

3.3 Register page

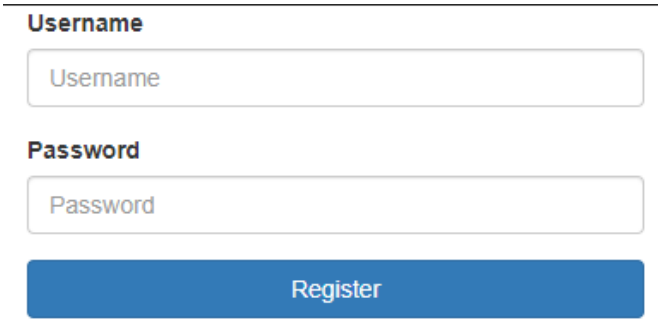

Fig 5: Register page

This is the register page which lets new users register themselves for registering complaints or for getting information about different kinds of crimes and to converse with the chatbot. It only allows unique usernames.

3.4 Sign-In page

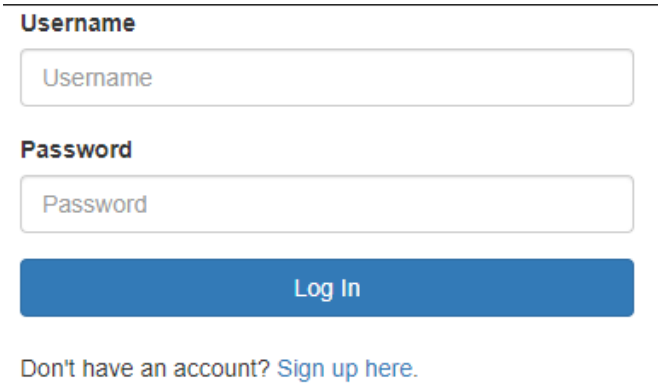

Fig 6: Sign-In page

This is the Sign-In page, it doesn't allow wrong username-password combinations.

3.5 Crime registration page with PoliceBOT

Fig 7: Crime registration page with PoliceBOT

This is the crime registration forms webpage of our website, it has three unique google forms which a user/victim of these crimes can fill and a copy will be sent to the authorities, user also gets a copy of their responses.

3.7 Cybercrime and bullying complaint form

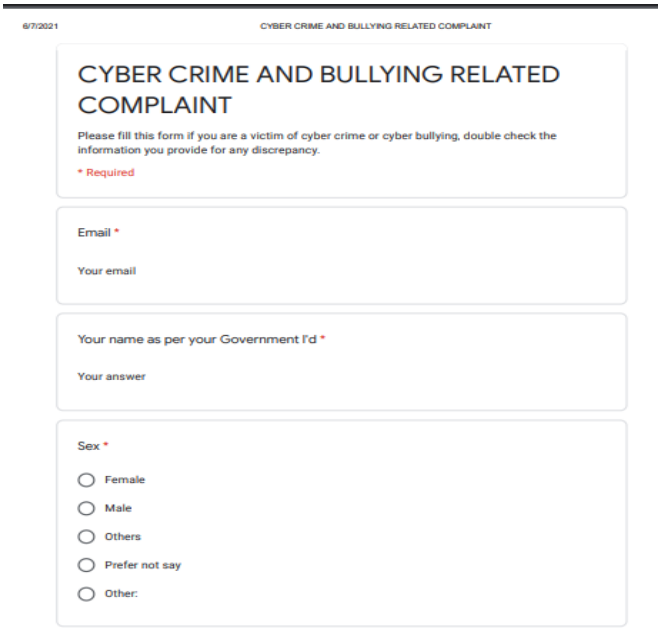

Fig 8: Cybercrime registration form snippet

This is one of the forms which we made; users can choose from various categories of cybercrime. For example- Cyberstalking, Online fraud, Identity theft, etc., and register their complaints. Also, a copy of their responses will be sent to them for their reference and future use.

3.6 PoliceBOT User Interface

Fig 9: PoliceBOT UI

This is the PoliceBOT user interface, the user queries are sent to the server via AJAX calls.

3.7 About section

Fig 10: About section of the website

This is the about section of the website, it has links to various government sites like the National Commission for Women, Government cybercrime portal, bureau of police dept website. This section of the website can be used to get additional information and awareness on crimes.

4. RESULTS

Responses of the proposed chatbot system-PoliceBOT are shown below. PoliceBOT helps the victim register their complaints on our website and also provide support in case a victim is feeling depressed or suicidal. PoliceBOT gives fast responses thus saving time and is user-friendly. Figure 16 shows the intent prediction confidence distribution of 0.95 (95%) which shows how accurate our chatbot is.

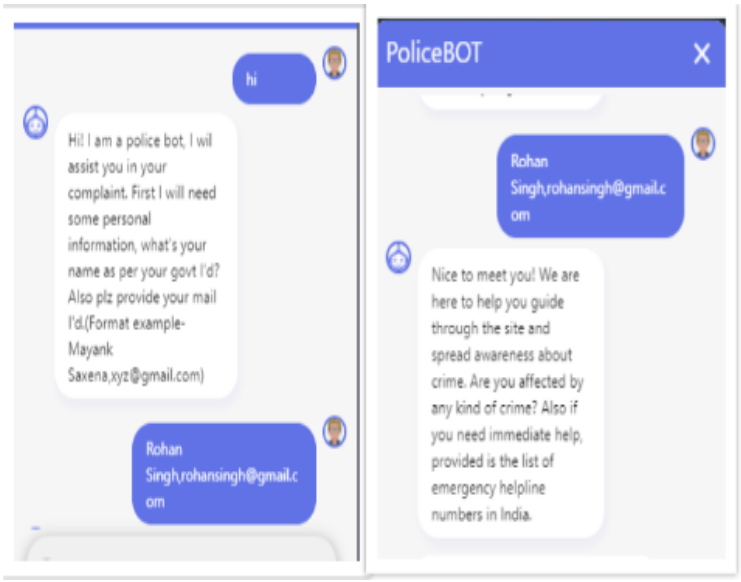

Fig 11: Chatbot response-1

Fig 12: Chatbot response-2

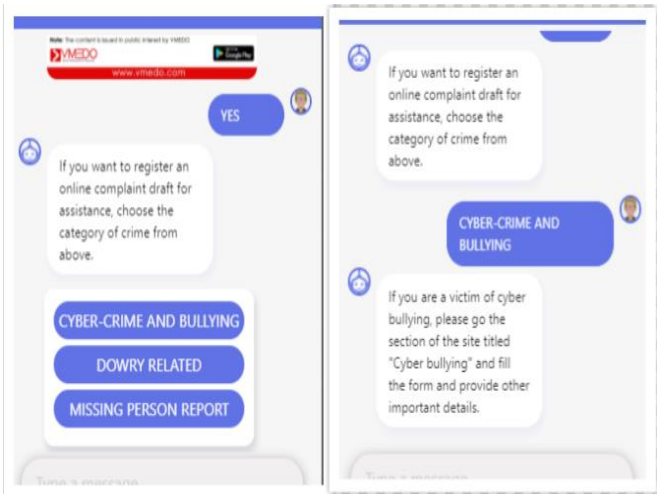

Fig 13: Chatbot response-3

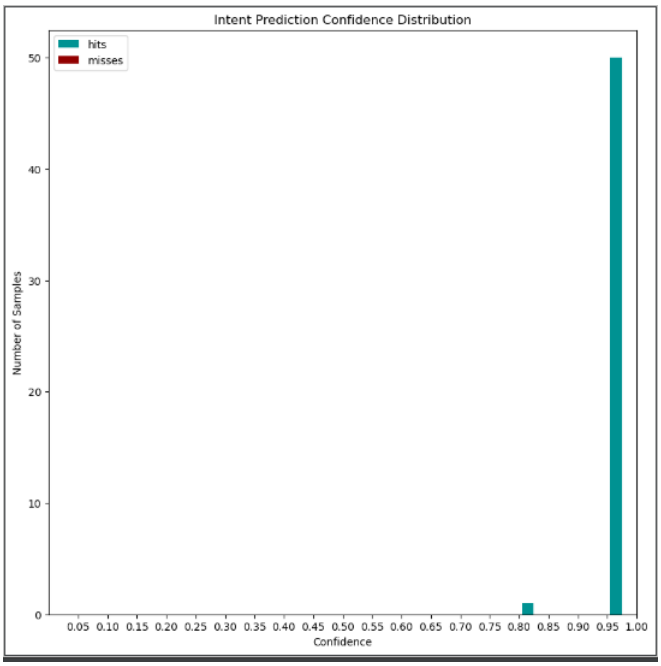

Fig 14: Intent prediction confidence distribution

5. CONCLUSION

Thus, with the help of this project the workload on the authorities can loosen up a bit and the time taken to deal with mundane or less important cases will reduce significantly. It will also help in reducing paperwork. This system also

provides crucial information like emergency contact numbers, list of government websites from where more information could be found about different types of online crimes happening. Unlike other systems in place, our system helps the user to register complaints across several domains rather than just a specific domain like “Crime against women” complaint registration, etc.

As future work, we can add more categories of crime on our website which the user can choose from to register a complaint. We can enhance the chatbot conversations by adding more conversation flows. We can add more functionalities like the nearest police station locator etc.

6. ACKNOWLEDGEMENT

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6. REFERENCES

[1] “What is a chatbot”, Available: https://www.chatcompose.com/what-are-chatbots.html

[2] “The Future is Now – 37 Fascinating Chatbot Statistics”, Available: https://www.smallbizgenius.net/by-the-numbers/chatbot-statistics/

[3] “Facts + Statistics: Identity Theft and Cybercrime”, Available: https://www.iii.org/fact-statistic/facts-statistics-identity-theft-and-cybercrime

[4]” Accompanying the families of missing persons: A practical handbook”, Available: https://www.icrc.org/en/doc/assets/files/publications/icrc-002-4110.pdf

[5] “What is Non-cognizable Offence?”, Available: http://odishapolicecidcb.gov.in/?q=node/135

[6] H. -T. Tseng, C. -C. Hsieh and Y. -W. Lin, "An Intelligent Disease Query System Based on Rasa NLU," 2020 International Symposium on Computer, Consumer and Control (IS3C), 2020, pp. 458-459, doi: 10.1109/IS3C50286.2020.00124.

[7] T. Sharma, J. Parihar and S. Singh, "Intelligent Chatbot for Prediction and Management of Stress," 2021 11th International Conference on Cloud Computing, Data Science & Engineering (Confluence), 2021, pp. 937-941, doi: 10.1109/Confluence51648.2021.9377091.

[8] P. Kandpal, K. Jasnani, R. Raut and S. Bhorge, "Contextual Chatbot for Healthcare Purposes (using Deep Learning)," 2020 Fourth World Conference on Smart Trends in Systems, Security and Sustainability (WorldS4), 2020, pp. 625-634, doi: 10.1109/WorldS450073.2020.9210351.

[9] S. Dangelo, Introduction to Watson Assistant, IBM Developers, August 2019, [online] Available: https://developer.ibm.com/technologies/artificial-intelligence/articles/introduction-watson-assistant.

[10] "Dialogflow basics", Dialogflow Documentation Google Cloud, June 2020, [online] Available: https://cloud.google.com/dialogflow/docs/basics.

[11] "How bots work", Azure Bot Service Microsoft, January 2020, [online] Available: https://docs.microsoft.com/en-us/azure/bot-service/bot-builder-basics?view=azure-bot-service-4.0&tabs=csharp.

[12] "Flask documentation”, Available: https://flask.palletsprojects.com/en/2.0.x/

[13] "Introduction to Rasa Open Source”, Available: https://rasa.com/docs/rasa/