

IoT Based Covid Chatbot using Telegram

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Abstract

The days of needing keyboards to avail a service are over. Users today use chatbots or voice assistants to interact with systems. Chatbots provide intelligent and adapted answers. The goal of a chatbot is to establish a productive conversation between humans and machines. For each user query that is considered input, the chatbot responds with an answer. From helping doctors manage their schedules to answering simple questions from the public, chatbots have proven to be very useful in healthcare. The global pandemic caused by the coronavirus has changed everyone's life and has affected it differently. People must be kept informed on various aspects. Purpose of this article is to discuss the implementation and model of a telegram-based chatbot system, which helps people understand the facts, precautions, preventive measures, and various other aspects related to the coronavirus. The bot also focuses on a person's mood and provides mental health support.

Keywords: Input, Response, Voice Assistants, Chatbot, Telegram

1. Introduction

The outburst of coronavirus has encountered a potential impact on humankind around the world. The corona virus has confused the society. Mankind is worried and asks many questions about the circumstances. Foremost, detailed knowledge is important. However, most people are unaware of this. Second, fear and uncertainty about the virus is increasing among people. Third, there is an urgent need for precautions such as wearing masks to prevent the exchange of air particles, disinfecting fingers, and increasing social distance. Finally, precautions to reduce contact, such as social isolation and quarantine, are mentally exhausting. People are often fed up with being alone. It is essential to inform the citizens about the current policy. By using this technique, mass spread can be significantly

reduced, which is all desirable from chatbots [1-3]. A chatbot to answer questions related to the covid-19 has been created. The chatbot works on the principle of Internet of Things [9].

As per IoT, cloud platforms like Render is linked with telegram through the internet. GitHub is used to incorporate the code which acts as an interface to club telegram and render. During the communication between the bot and the client, the chatbot learns how to answer the question, ask the question, and in some cases redirects to a website where the question can be answered.

Pandemics are different from other extreme natural force causing great damage. Individual opinions in a pandemic can significantly exacerbate the condition. Because, if one is not extremely careful, one citizen can spread it throughout the district. In addition, the fear of transmitting the virus to others, especially bystanders and healthcare workers, due to the stigmatization of a rare disease exacerbates the severe consequences of an infectious disease.

As a result, when pandemic occurs, mankind may hide their symptoms from others and are responsible for the detrimental effects. Finally, during an outbreak, physical gatherings, which are often organized to socialize and interact with people during difficult times, such as family get together, prayers and ceremonies, and sports competitions, should be avoided. This scenario provides a stimulus that increases the individual's loneliness, which can lead to serious mental health problems.

People tend to discuss personal information, such as symptoms, with chatbots rather than people, when they are depressed and want to be alone. In spite of the fact that global health department points out the importance of human emotional health, this raises serious concerns, especially during a pandemic. The name is based on the idea to create a chatbot to relieve worthless anxiety and provide precautionary measures. Bots are classified as follows:

- Chatbots: Bots that simulate human interaction by responding to specific words with pre-programmed responses.
- Web crawlers: These are bots that browse the information of online sites all over the internet.
- Social bots: Social bots are bots that operate on social networking sites.

- Malicious bots: These are bots that scrape content, send spam, or carry out spammer's attacks.

2. Literature Survey

2.1 Chatbot for admissions

Communication of new students with the university administration or the vice versa takes a lot of time because it is done manually. It is very appreciated to communicate one-on-one. The goal was to reduce the burden on the admissions director and others by developing a compelling chatbot. To check through the dataset and discover a reasonable alternative, a suitable algorithm was created. Followed by which, the program responds to the user by providing a relevant web link [10-11].

2.2 Knowledge - based Conversational Chatbot as an Intelligent Tutor

Virtual Assistants have evolved a lot recently. On mobile devices, handling of simple requests such as setting alarms or alerts and making a phone call by simple chatbots are now available. Tools of automation to build more complex chatbots have been developed. The growing presence of Machine Learning (ML) in the day-to-day life, has made the whole process of "thinking" a bit more efficient than just pattern matching. However, if the query nodes are not in the correct order, it may result in incorrect responses [12-14].

2.3 Chatbots in the fight against the COVID-19 pandemic

Institutions and individuals are also interested in knowing where diseases are developing and how it can be tackled during the pandemic. Chatbots or virtual agents can be extremely useful in such situations; however, the complexities of tracking symptoms, disseminating information, tracking, changing behavior, and supporting psychological health must also be addressed. Since humans with stigmatized illnesses usually avoid seeking education and health care, chatbots may be suited well to test for symptoms in the pandemic. According to research findings, people are more willing to reveal sensitive information about details on the symptoms to a chatbot than to a person [15-16].

2.4 Chatbot on Customer Support Industry

Supporting technically is a major part of the computer industry that involves a large number of participants and other resources. Small scale businesses cannot afford to create a separate department to handle inquiries of the consumers, even though larger companies have

a dedicated workforce to work there. Automation is linked to higher output and lower wages in industrial organizations. The management of customer queries such as product complaints, reviews, and customer justifications along with experience could be simplified using adaptive and smart technologies (Chatbots) that can interpret the query provided and provide an appropriate assistance. Automating the process of handling user queries with chatbots has attracted much organization's interest, as it has the capacity to save a significant amount of resources while improvising the overall customer experience. The article [15] gives an in-depth look on the evolution of chatbots over the years and the methods used to adopt them in various organizations.

2.5 Chatbot learning techniques

A chatbot allows a customer to make requests in the same way they would to an individual. The increased use of advancement in life is changing the way students process information and learn everyday. Thanks to IoT gadgets, professors and teachers can now provide students with a personalized learning environment. Specialists have created foundations that can determine if the students can understand the research material or not. Chatbots are conversational devices that facilitate learning. Here, the article [16] examined the seven ways, chatbots and artificial intelligence are trying to influence education.

Table 1. Literature survey

Authors Name and Citation	Motive	Limitations
Nikolaos et al. 2014 [4]	To address the admission related query by suggesting the relevant web link to the user	Can address only limited queries
T. Sukanya et al. 2020 [7]	To summarize the evolution of chatbot	Chatbots were incapable of giving a reasoning-based reply.
Xavier et al. 2018 [5]	To design an independent chatbot with arithmetic functions	Formal communication was done. Complex queries were not addressed.
Ujawalet al. 2019 [8]	To explore the 7 manners of artificial reasoning method	Only the general queries were replied

Adam et al. 2020 [6]	Artificial intelligence based technique for addressing healthcare related queries	Some negative replies werefound in the outcome
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3. Proposed Methodology

Bots are used to automate a process. Telegram bot is used to communicate with the telegram account. Telegram is then linked to render in the backend so that it can trigger the messages on the bot. The telegram chatbot is programmed to provide replies to the user's queries. The code for the chatbot is written in Python which comprises all the telegram libraries and methods to be implemented.

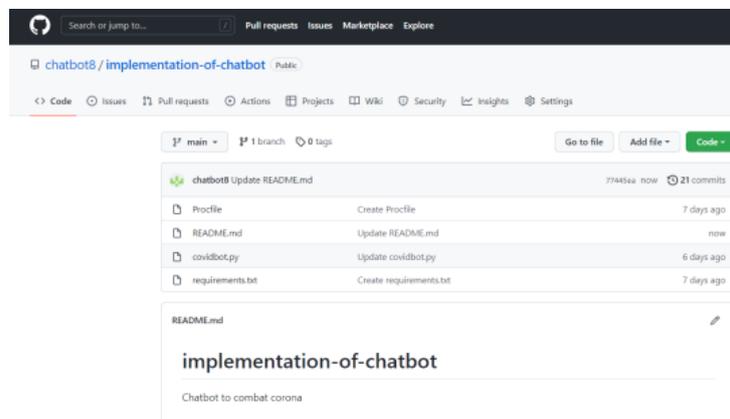


Figure 1. GitHub repository

BotFather from telegram is the basis to generate the bot token. In order to get the token, a series of steps should be followed. Go to @BotFather on telegram and enter the “/start” message. Then click on “/newbot” followed by a set of instructions to create a name and username for chatbot. BOT_TOKEN is generated for the chatbot. A new repository is created on GitHub that consists of specific files that need to be created for the smooth functioning of the chatbot and is shown in Figure 1.

- README.md - It specifies the description of the chatbot.
- chatbot.py - Python code for the telegram chatbot is included in this file.
- Procfile - It acts as facilitator to kick start deployment of chatbot on Netlify cloud.
- requirements.txt - This text file consists of the names of libraries and modules that are of the chatbot.

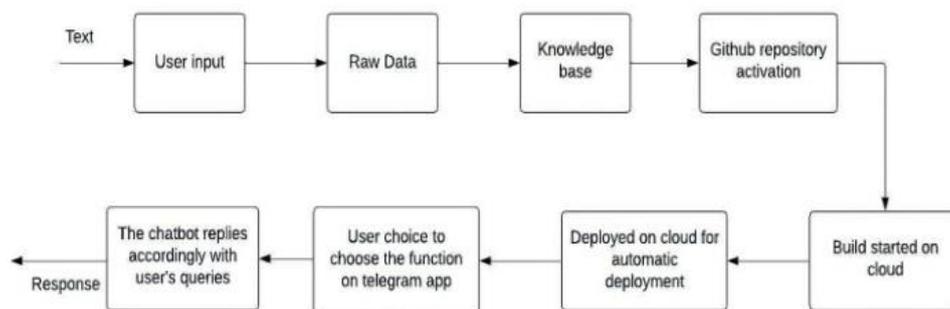


Figure 2. Block diagram of Covid chatbot

Figure 2 outlines the functioning of the telegram chatbot. At first, input from the client goes as prompt to start off with the activity. Input from the user is matched up with the python code file that is under the repository of GitHub. The equivalent function is active and Render build is stimulated.

The working of chatbot is elucidated by the flowchart and is shown in figure 3. Figure 4 shows that the bot token is used as a value to the environment variable. While creating the site in the Render, there exists a separate tab for creating an environment token group. The user is required to feed the key and value. This plays a pivotal part in assuring the security purposes in which the address of BOT_TOKEN is hidden from the public.

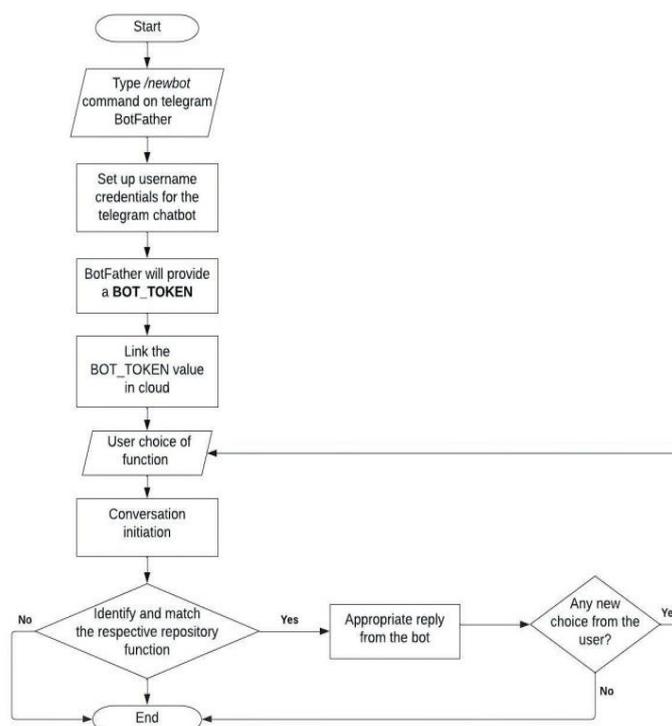


Figure 3. Flowchart of telegram chatbot

When the token is fed to Render cloud, the activity in the site is visible. The figure 5 represents the log of deployment where build begins after installation of the necessary libraries. Once the build is successful, it is launched and the telegram chatbot is in an active state where it can reply to the user.

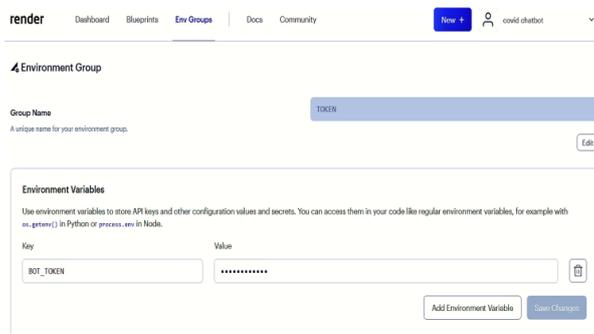


Figure 4. Variable feature



Figure 5. Deploy log in the cloud

The tools used for the chatbot are Render for cloud service, telegram for messaging and GitHub to employ python code. The description of the above mentioned tools are as follows.

3.1 Render Cloud Application

Render permits the user to see the effect of changes to the site before they go live. Render deploys previews and permit any partner to see forthcoming changes. Render is an interface that links the code with the app. The GitHub repository can be linked directly, thereby making the deployment process easier. Render build is done by a trigger which is then deployed. In order to get the bot deployed, it is connected to GitHub and a series of steps are to be followed. To create an app, the first step is to log in to the render website and click on the new site from Git, authorize GitHub when prompted and provide access to the newly created app. The branch to be deployed is the main. Render can be concatenated with GitHub, GitLab and BitBucket.

3.2 GitHub

GitHub is a place where passionate developers can get ideas and work with them to get results. This is a code platform for collaboration and version control. People from all over the world can contribute to this work, which is cumulative. Projects can be managed by running standard Git commands through the standard Git interface (command line interface). There are many Git clients and add-ons. This allows users to search selected repositories and download publicly available repositories.

Registered user accounts can participate in technical discussions, management of repositories, contributing ideas to public repositories on the platform and analysing code activations. It provides all the core functionalities of GitHub for free. Its main goal would be to simplify repositories and troubleshooting in software development. Tags, milestones, responsibilities, and a search engine can be used to track issues. Git will allow pull requests if the user can suggest any changes to the logic or the code. Users who can view proposed changes and approve various requested changes. On GitHub, this is called a "commit", and each commit is logged and accessed when needed.

3.3 Telegram

Telegram is a cross-platform and a cloud-based messaging app which allows users to access discussions on many platforms at the same time. The bot token for the chatbot is generated by bot father using the Telegram app. The foremost thing, that is the address of bot token is fetched by telegram. Hence telegram acts as an initiator for the process of creating chatbot. Cloud chats and groups are encrypted between the server and the app, and this prevents third-parties from accessing the information. The access to data is restricted to telegram server. Telegram acts as a medium of contact between the user and the cloud service. Users may exchange text messages, make voice and video calls, and share unlimited amount of photos, images, animated stickers, documents and audio files. Unlike other chat platforms, telegram is built to readily adapt to bots. It offers a user-friendly interface and is compatible with all devices[17].

4. Result and Discussion

The chatbot is equipped with python functions like Covid information that includes all the variants of coronavirus and description of how mutation of virus occurs. The bot additionally figures out how to give strong data of case insights, side effects and the prudent

steps. Various types of vaccine facts are also inculcated in the chatbot. The chatbot is user friendly and hence provides direct links of the medical shopping items which is the need of the hour. Culminating to all the points related to physical health and mental wellbeing is of paramount importance.

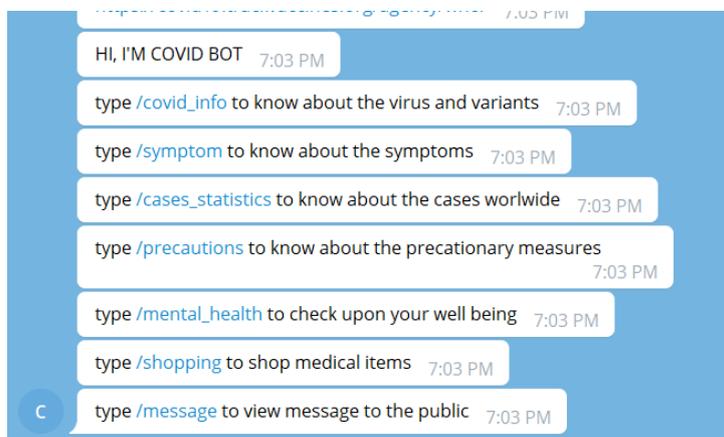


Figure 6. Mental health support

Figure 6 illustrates the welcome message for the user from the chatbot. The message presents a catalogue of functions the bot can perform. This description serves as an index wherein people can understand and select messages appropriately.

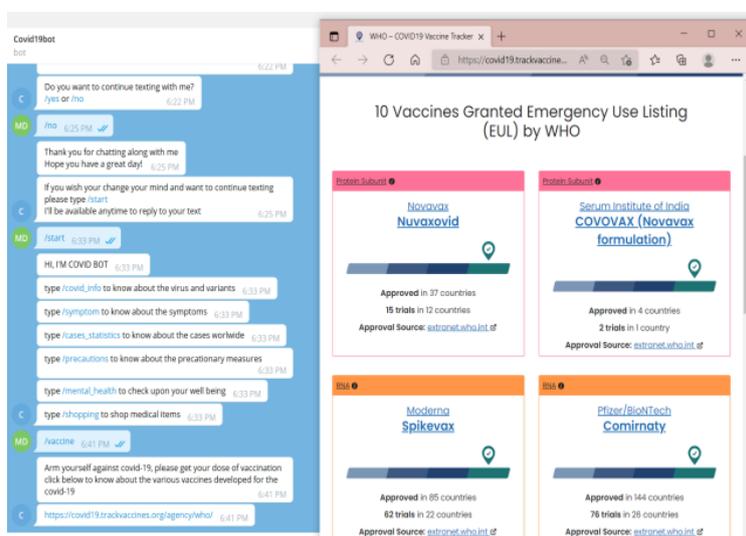


Figure 7. Vaccine information

The information about vaccines proposed by WHO in order to educate the public is displayed in the figure 7. The main objective of this function is to promote that immunization is the need of the hour. The hyperlink in the message directs the user to view WHO approved vaccines.

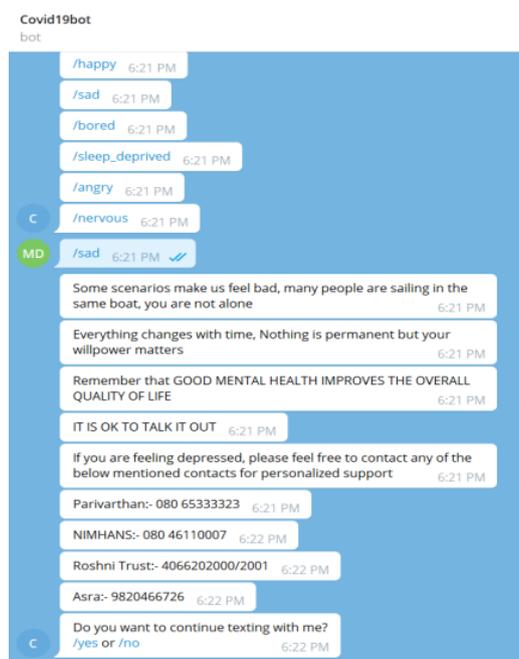


Figure 8. Mental health support

The emotional well-being of a person is a significant factor of the peace of mind. This part decides how you're ready to work mentally and behave socially among others. It is essential to monitor and further develop mental wellbeing, utilizing suitable measures. The chatbot is furnished with various moods of a human being. This enables the user to pick his mood at that point of time and receive support regarding it. The above figure demonstrates how the chatbot is trying to console a person who has stated that his mood is sad.

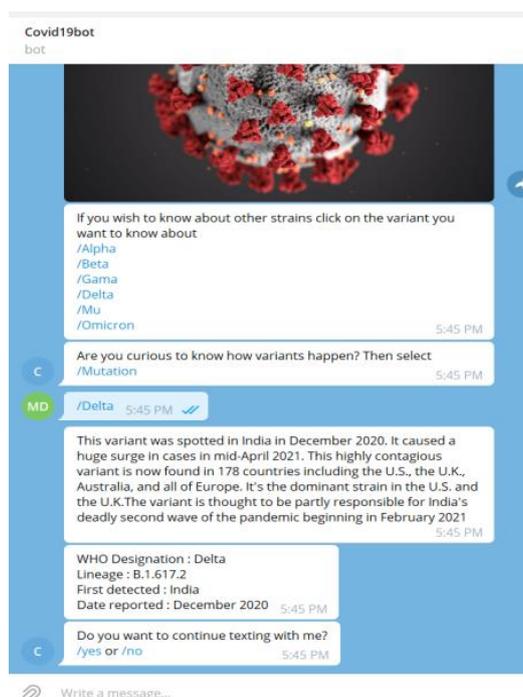


Figure 9. Variant information

This description serves as an eye opener to the public by displaying various variants of coronavirus. When the user types a particular variant, the chatbot displays facts about it and gives the user another chance to view information about any other variant and also how the mutation in viruses occur, and is shown in figure 9.

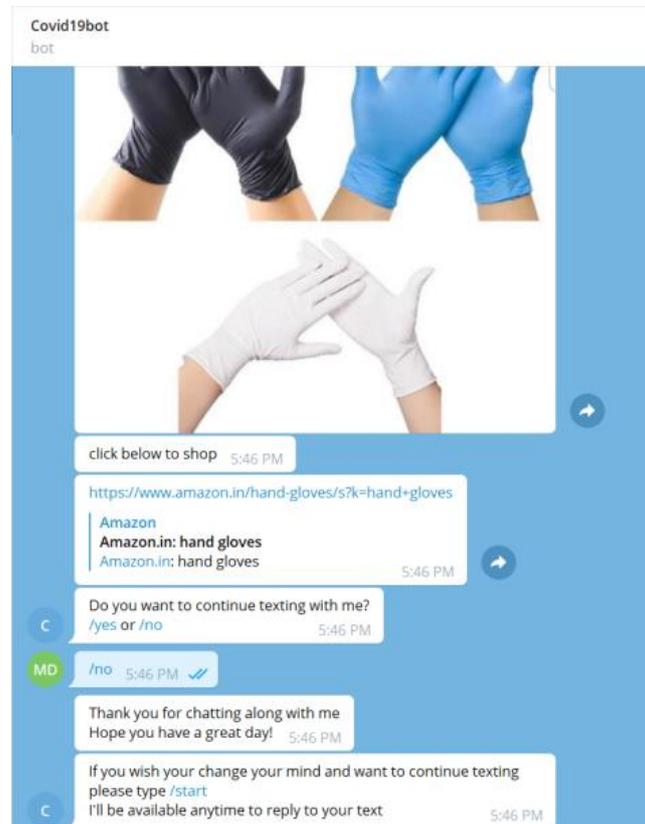


Figure 10. Medical shopping

In order to ease the burden of the user, chatbot is comprised of functions that deal with medical shopping as shown in figure 10. The person is provided with the hyperlink of the item, so it is made feasible for shopping.

5. Conclusion

In this paper, a telegram chatbot has been designed to lay facts and figures with regard to the virus. There might be inexperienced individuals who lack knowledge regarding different characteristics of the pandemic. Along these lines, chatbots can be of service to them by getting vital information at the same time. Highlights like looking for clinical items, and investigating the particulars of the virus can help people save time and lives. Furthermore, it can extend support for mental health and also promote that one's psychological mindedness is vital.

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