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A Chat Powered Workplace with Hybrid Interface

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Abstract: This hybrid chat application with an AI based technical assistant will come handy while searching for an answer to a technical query. Whenever a user faces a technical problem, that user will search that problem on various forums. This application will be user friendly in which users can ask their queries to the Chabot and if the Chabot is unable to answer the query they can ask another user who is proficient in that particular skill. After the problem is solved by another user we will analyze the chat conversation of the users. The Chabot will learn through the analyzed conversation and next time it will be able to give a solution to that problem.

Keywords: Dialogflow, Flutter, Big Data Analytics, Hadoop, Firebase, Firestore.

I. INTRODUCTION

As developers, we face numerous challenges when working on large emerging technologies with which we are unfamiliar. To resolve these concerns, developers upload inquiries on various platforms. When using these portals to ask questions, there seems to be no engagement here between the individual raising the issue and the ease of accessing the answer. A developer may have to wait a long time for a solution[1].

Individuals everywhere now are indeed very acquainted with chat applications such as Facebook, Google Hangouts, and so on. And put these application forms to use in your daily life. When viewers would like to ask more questions, AI-based Chatbots play a vital role in assisting them.

Such Chatbots can comprehend natural speech and then provide a response based on the knowledge of the recipient's question. To assist developers in improving their performance and resolving their issues. We're working on a platform that will allow devs from varied ethnicities to come into contact with one another[2].

This platform will allow for one-on-one encounters, which again will aid in a greater understanding of both the workaround. If a designer's conflict is not addressed, that developer can inform some other developer, so they can both address the problem. A Chabot powered by AI will be willing to facilitate such developers in answering the majority of their questions. Having to wait for another available operator for minutes is not a solved problem, but Chatbots are the most likely candidates to solve it. Preserving a 24-hour alert system ensures regular dialogue.

A developer can focus on one group of customers and respond to one query. A Chatbot, on the other hand, can address tons of questions at the very same time. Actions like changing or querying records are almost instantaneous for bots, significantly improving developer satisfaction[3].

II. LITERATURE SURVEY

A. Dialogflow

It is a comprehension NLP platform that enables collaborative user interfaces to be designed as well as integrated with online services, online apps, gadgets, robotics, augmentative communication systems, etc. It may give customers a different and fascinating chance to communicate with goods they create through Dialogflow. This could assess particular types of customer information, such as textual or speech sampling (e.g. from mobile or voice recording). It could also reply to clients in a variety of ways, including text and synthesized monologue[4].

B. Flutter

It largely consists of widgets, as important components of all applications using Flutter. A widget may be solitary stateless or multilingual stateful. There is no inherent characteristic in an internal state of stateless widgets that can be adjusted when generated. By altering underlying hidden representation without a reset, stateful widgets can indeed be modified dynamically. Whenever creating any dynamic applications on Dart, stable panels are key. Flutter structure contains settings because of its widgets that may have been retrieved concurrently whenever the widget is created and updated over the whole app product lifecycle.[5]

C. Big data Analytics

It is indeed a science that deals with methods for analyzing, methodically extracting content about, or somehow dealing with data volumes that are far too massive or complicated for typical data-processing software applications to handle. It is indeed a frequently difficult method of evaluating Big Data, which enables organizations to make educated business strategies, to disclose details – including such previously unknown patterns, association, consumer preferences, and consumer behavior. Data analytics enables researchers, academics, and enterprise customers to decide more and more quickly on unattainable or unsustainable data[6].

D. Hadoop

The Apache Hadoop computing library is a framework that considers the conveyed preparation of enormous informative sets across groups of PCs utilizing simple programming models. Its goal is to scale up from a single worker to a large number of devices, each giving close calculation and capacity. Rather than relying on hardware to convey good robustness, the real library is designed to recognize and deal with disillusionment at the application layer, therefore conveying extremely accessible help on top of a group of PCs, each of which may be susceptible to disappointments. Hadoop isn't just one solution; it's a stage with a variety of critical components[7].

E. Firebase

Firebase is a Backend-as-a-Service provider. It is classified mostly as Unstructured NoSQL has given dataset application that saves data using JSON-like archives[8]. The Firebase, an API automatically synchronizes application information throughout mac os, Android, and Web devices and maintains it on Firebase's server, was the company's initial product. The item aids programmers in the development of continuing community apps.

F. Firestore

Google Firestore, officially cloud - Centric Firestore, is a component of the Google Firebase applications development stage. It is primarily a cloud-based NoSQL data source for storing and modifying data. Firestore may be easily accessed by mobile and desktop platforms via local SDKs. It allows individuals to benefit from Unity, Java, C++, Go, and Node.js SDKs, as well as support for REST and RPC APIs[9]. The Firestore database enables programmable scaling, improved execution, usability, and also provides a high level of consistency. With the consistent concertgoers, Firestore aids in the synchronization of information across several consumer apps. Only for the verification phase, it makes use of Google's Cloud Identity and Access Management features. Firestore stores result in the form of reports, even with archives organized into collections[10].

G. Chatbot

Virtual assistants are programmed systems that use artificial intelligence and common language preparation to apprehend how such a person requires and assist them to their perfect result with as little labor for the end customer as possible. As if you had a remote assistant for your customer interaction touchpoints[11]. Virtual assistants (more precisely: interchange platforms or conversation moderators) are pieces of technology that are typically used as an intermediary between a company and its customers. These bots' tasks can range from easy specialized support for products (for instance, the standard "Had anyone tried spinning it every so often?") to organizing products given by the organization.[12]

H. Benefits of Chatbots

1) Chatbots used for customer services can result in productivity as Chatbots reply quickly and are convenient because they are available 24/7. They also provide quick access to information.
2) On the messenger system, chatbots can be accessed by a broad number of people and personalized messages can be automated[13].
3) Using Natural Language Processing, a chatbot can understand the user's question in a better way.
4) The latency will be very low when the user interacts with the chatbot as compared to another user.
5) We can get insight into the user's behavior and what kind of questions the user asks. This will help in improving the user experience in the future.
6) Chatbots have a wide range of applications such as sales, marketing, customer services, etc[14].
7) Chatbots help in increasing the user's engagement in the application.
8) Chatbots are as such programmed to correct human's error without any fail.

III.PROPOSED SYSTEM

A. Novelty Work

Unlike other chat applications, this app consists of a chatbot to help the users when they are looking for a solution to their technical problem. In this application, the user will search for another user based on skill instead of names. When the users are not available the person can ask it's a query from the chatbot and here the output with more accurate answers is used. Also the users no need to wait for the server to be free as it can handle many users at the same time.

A comparison between output generated by Stackoverflow API and output generated by Query to Stackexchange database was done, which resulted in a solution providing that Stackexchange database query provides accurate output. So in the presented application outputs of our chatbot are presented by learning provided by the Knowledge base in Dialogflow. The data will be stored to the HDFS as a time will come when there will be larger amount of data.
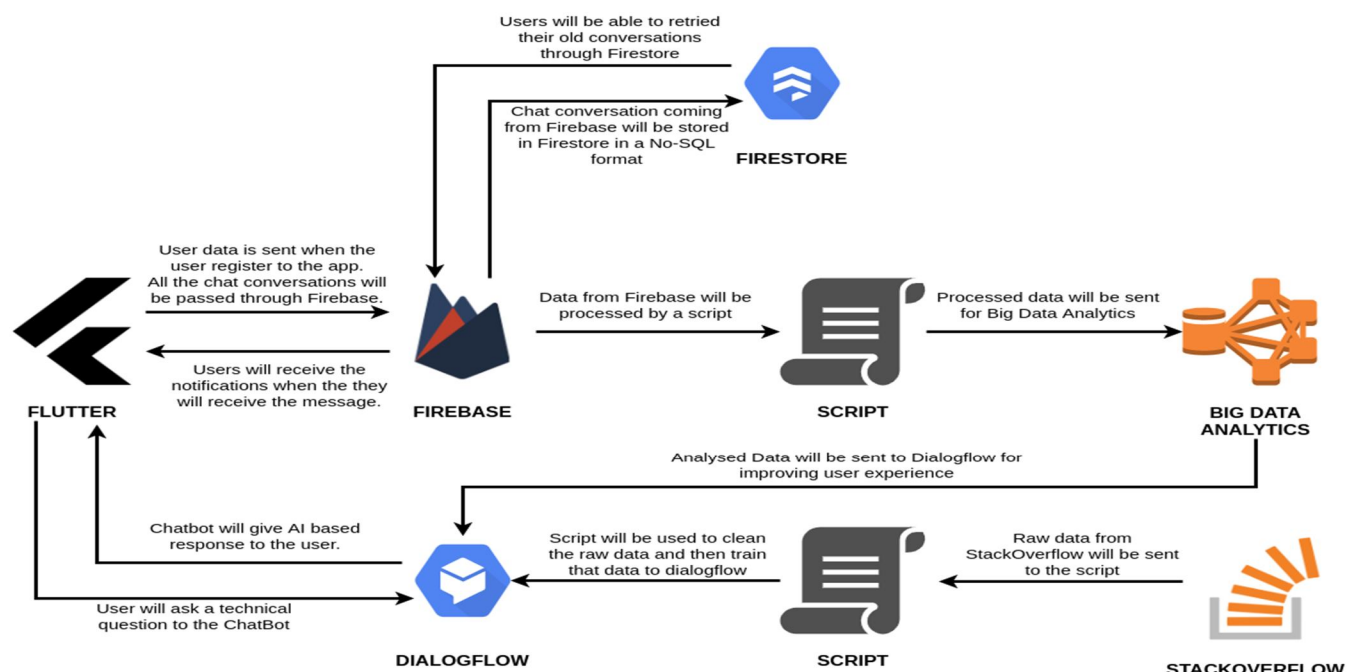
B. Workflow of Proposed System

Fig.1 Workflow of the based on presented application

1) *User Authentication:* When a user opens the app for the first time, the user will go to the registration page and register himself. The data will be stored in Firebase and Firestore. The user will receive an email verification link on the registered Email ID and after opening that link the user will be redirected to the home screen[15]. When the user tries to log in, the email and password will be sent to Firebase Authentication. After verifying that the email id and password match the registered user, then it will be checked if the email is verified or not. If the user is verified then the user will be redirected to the home screen.

2) *A skill-based search of users*: When a user wants to find a user with a certain skill, then the user will open the search page and search for that particular skill. That list of users with that particular skill will be fetched from Firestore and the user can chat with a user by selecting it. *Interaction with a chatbot:* The user will interact with the chatbot whenever he wants to ask a question (e.gWhat is python? or What python?). The chatbot will understand the question using Natural Language Processing and send the answer in response.

3) *Big Data Analytics*: With the increase in the number of users the proposed system will have a large amount of data and it will be considered as the Big Data problem[16]. A script will run daily that will take the user's data and move that data to HDFS. Hive will be used to analyze the user's behavior and what kind of question the user is looking for.

4) *Training Chatbot:* Initially the proposed system will take the raw data from StackOverflow's database and a script will be executed to clean the data and train the chatbot with that data.

IV. RESULT

A. Analysis of User Interaction

1) *GUI Results:* The main screen consists where the user will search for different other users depending on their skills required.
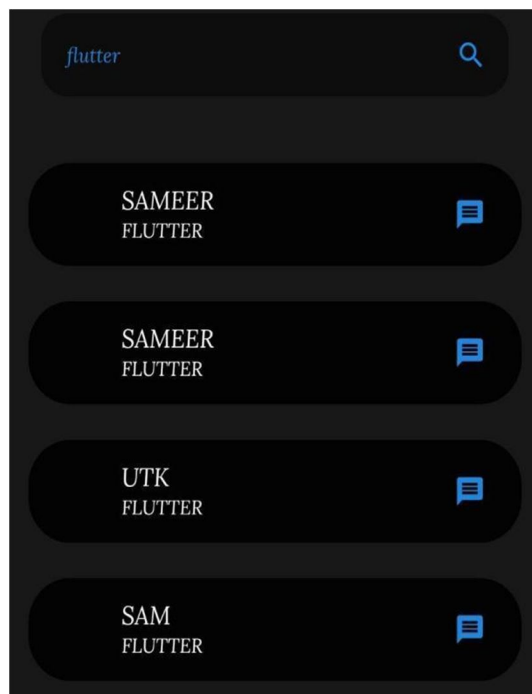

Fig.2 Skill-based search results

B. Analysis of chatbot result

1) *With Stackoverflow API:* While using Stackoverflow API to get the data to train the chatbot. We found data we have to hit multiple APIs to get the desired result which is not an efficient way.

2) *With Stackexchange Database:* While using Stackexchange Database we need to query and get up to 50,000 results with one query and after we train the chatbot with the result, it will be quick to respond to the result by hitting a single API.

3) *GUI Results:* The main work of chatbot depends on the Knowledge base of the Dialogflow chatbot. In the proposed application data from Stackexchange Database is used to train the chatbot.

Fig.3 Stackexchange Query results

C. Comparison of Output from Stackoverflow API & Stackexchange Database Query

1) Stackoverflow API gives a list of answers or a list of questions whenever hit for user queries requests while the data generated via query asked from Stackexchange database gives us a column view of data with proper question and answers.

2) Stackoverflow API produces output with lots of bad data while the data generated via query asked from Stackexchange database gives less amount of bad data as only specific columns of data are provided.

3) Stackoverflow API takes more time to produce the required output while the data generated via query asked from Stackexchange database gives user-friendly and strict correct output.

D. Analysis of app

Using Flutter to target multiple platforms with a single codebase was very helpful. It reduces the time and the efficiency is close to the native app.

E. Techstack (Technology & Framework used)

1) *Flutter:* This is used to develop a cross-platform application that can run on different devices with a single codebase.

2) *Firebase:* This is used to handle the backend for the app including authentication.

3) *Firestore:* This is used to store the data in an encrypted non-structured format.

4) *Dialogflow:* This is used to build and train the NLP-based chatbot.

5) *Big Data Analytics:* This is used to analyze the user's behavior and train the chatbot to serve in a better manner.

V. CONCLUSIONS

The whole idea behind this paper is to provide an efficient solution. With this chat application, we can reduce the manpower and can reduce the time taken to find the solution to any technical question. which we generally post on some forums or search on google.

The proposed application uses the Flutter framework for the User Interface which is used to build cross-platform apps. So, we can run it on different platforms such as Android, iOS, Web with a performance close to native apps. This app will help the developers to interact with other developers to build a strong developer community. This app uses an NLP-based chatbot that will understand the technical questions and answer them accordingly. XSalsa20 encryption algorithm will be used to store the data securely. This application can answer most of the user's queries using NLP. The chatbot will be trained to keep in mind the user's past requirements predicting the future requirements.

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