Department of Information Technology

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UNIVERSITY OF MUMBAI

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A Project Report on

DEXTER- The College FAQ Chatbot

Submitted in partial fulfillment of the degree of
Bachelor of Engineering(Sem-7)
in
INFORMATION TECHNOLOGY

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1.Project Conception and Initiation

1.1 Abstract

- Chatbot can be described as software that can chat with people using artificial intelligence. These software are used to perform tasks such as quickly responding to users, informing them, helping to purchase products and providing better service to customers..
- In college’s, especially during the time of admission , reception gets crowded and people have to wait to get their queries solved.
- Al though every college has its own website, not everybody is able to find the answer to their query.
- This chatbot will be embedded on the college website and will be able to answer any college-related query easily.
- Chatbot will be able to answer multiple persons at the same time, people don’t have to visit the college to get their query solved and it will be available 24/7.

1.2 Objectives

- To reduces the work stress of reception.
- To make navigation through the college website easier for students
- To provide answers regarding “What do I do know?” questions.
- To improve Query Handling System since chatbot is available 24 x 7.
- To help new student get familiar with the new Environment.
- To help students give a brief idea about college so that they can decide whether they should visit the college or not.

1.3 Literature Review

- In literature[1] - The authors have described about how the number of individuals looking for well being data from the web increments drastically.
- A few elements impact individuals to utilize the web for scanning for well being data. Confided in restorative data, for example , infections, side effects, and treatment is important for individuals to deal with some broad sickness or being utilized as a bit of choice help data before visiting a specialist.
- In this work , the therapeutic guide framework called ”MedBot” was created by utilizing Dialog flow controlled by Google’s machine learning.

1.3 Literature Review

- In literature[2]- The author describes about a chatbot whose exploration displays a strategy for creating chatbots to serve their clients.
- A profound learning based conversational man-made brain power procedure was utilized as apparatuses for learning discussion among machine and client.
- Additionally, the means required are the procedure utilized related to the convolution neural system strategy by utilizing Tensorflow preparing to improve the precision of these chatbots.
- This article has not used cloud for their databases to rage which takes a little longer to fetch data . Hence the speed off etching is slow.

1.3 Literature Review

- In literature[3]- The author describes how the quantity of web-based business clients has expanded quickly. In 2017,the number of computerized purchasers was over 1.66 billion individuals world wide up from 1.32 billion in 2014.
- The paper also gives information about on line shops which regularly require administrations, for example, live talk for clients support.
- As the quantity of clients has expanded by about 10 percent every year, the interest for the client the administration additionally increments, authors came up with an idea of converting online client support methodologies to a chatbot to reply to clients' inquiries consequently.

1.4 Problem Definition

- The main reason behind choosing this topic as the project was that many students were facing issues regarding the updates of revaluation examinations or results, about any important notice and events going on in the college.
- It becomes really difficult for students who stay far away from the college and they just have to come to college for inquiry purpose.
- Even reception becomes complete chaos during the time of admission, many students and parents visit the college reception to get their queries solved.
- The receptionist will only be able to handle 2 to 3 person at a time and others will have to wait for their turn. This will also cause tiredness for receptionist.
- To overcome this problems, we are making the graphical user interface inquiry chatbot which gives 24*7 updates regarding any ongoing events or notice.

1.5 Scope

- As per the predicitons, that seems to appear in the coming five year’s, there is a high possibility that about 80% of the communications will be done through Chatbots.
- Chatbot messengers will be in charge of faciliting business to consumer interaction, which will be in a flawless manner.
- Now this gives the explanation on why outlets stores, online retailer promote the installation of text-related chatbots and voice-assisted bots for verifying orders and making the delivery and purchase of orders.

1.6 Technology stack

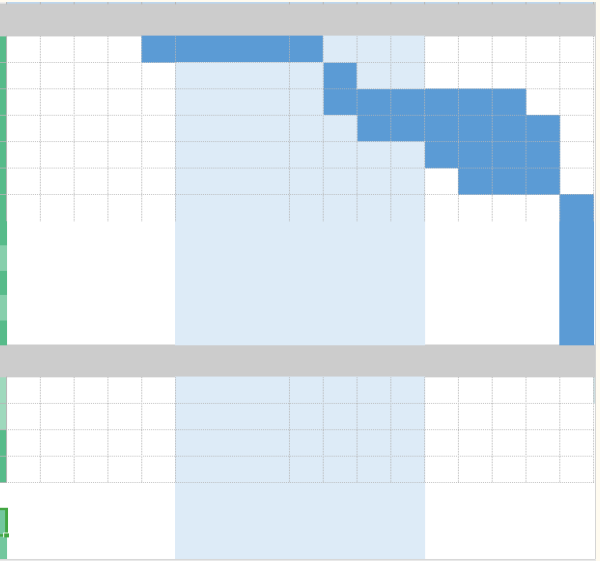
- Rasa Stack
- RNN (Recurrent Neural Networks)
- LSTM (Long Short Term Memory)
- Artificial Intelligence

1.7 Benefits for Environment & Society

- Accessible anytime
- Handling Capacity
- Customer Satisfaction
- Flexible attribute
- Cost Effective
- Personal Assistant
- Alternate sales channel

Project Timeline

1	**Project Conception and Initiation**					
1.1	Research paper search	Chintan,Chaitanya,Ajink	7-10-19	7-26-19	3	100%
1.1.1	Research paper finalization	Ajinkya	7-10-19	7-26-19	3	100%
1.2	Project Title	Ajinkya	7-10-19	7-26-19	3	100%
1.3	Abstract	Chaitanya,Chintan	8-23-19	8-30-19	1	100%
1.4	Objectives	Chaitanya,Chintan,Ajink	8-23-19	8-30-19	1	100%
1.5	Literature Review	Chintan,Chaitanya,Ajink	8-23-19	8-30-19	1	100%
1.6	Problem Definition	Ajinkya,Chintan,Chaitan	3-23-18	8-30-19	1	100%
1.7	Scope	Chintan,Chaitanya,Ajink	8-23-19	8-30-19	1	100%
1.8	Technology stack	Ajinkya	8-23-19	8-30-19	1	80%
1.9	Benefits for environment	Chaitanya	8-23-19	8-30-19	1	100%
1.1	Benefits for society	Chintan	8-23-19	8-30-19	1	80%
1.11	Applications	Chintan,Chaitanya,Ajink	8-23-19	8-30-19	1	100%
2	**Project Design**					
2.1	Proposed System	Ajinkya,Chaitanya,Chint	9-19-19	9-27-19	1	70%
2.2	Design(Flow Of Modules)	Chaitanya	9-19-19	9-27-19	1	70%
2.3	Activity Diagram	Chintan	9-19-19	9-27-19	1	100%
2.4	Use Case Diagram	Chintan	9-19-19	9-27-19	1	100%
2.5	Description Of Use Case	Chintan	9-19-19	9-27-19	1	30%
2.6	Modules	Ajinkya,Chaitanya,Chint	9-19-19	9-27-19	1	
2.6.1	Installation of Rasa Framework		9-19-19	9-27-19	1	



Project Timeline

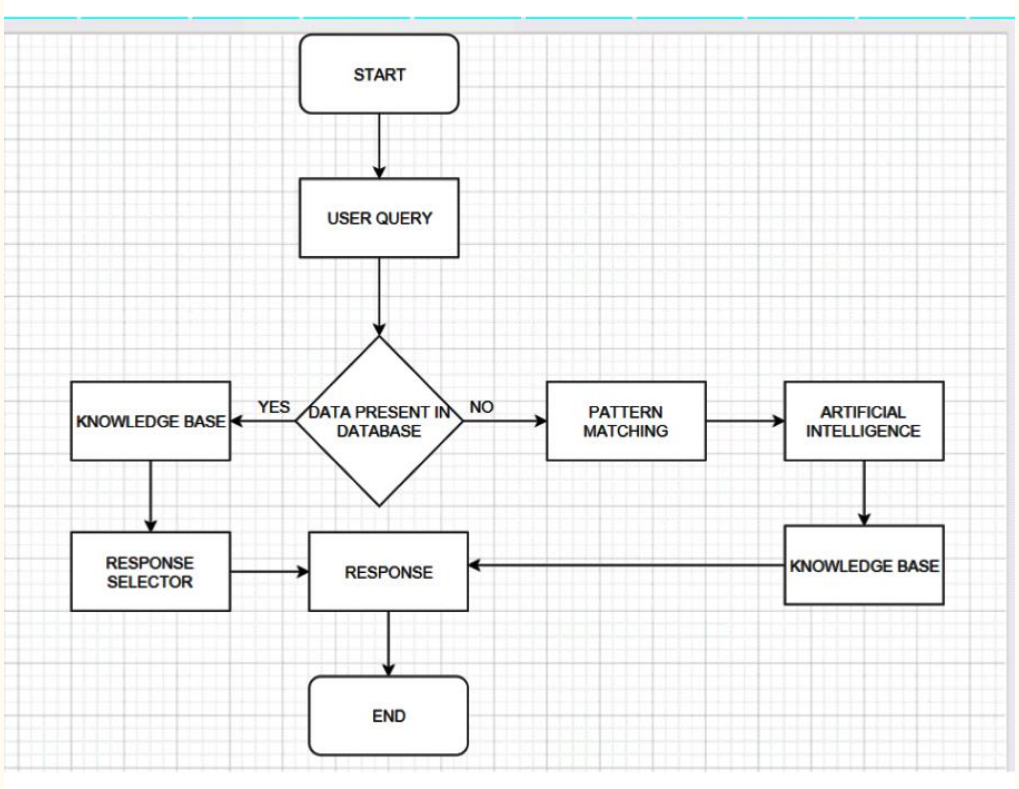
3	**Project Implementation**					
3.1	Installation of Rasa Framework	Ajinkya	9-28-19	10-5-19	1	100%
3.2	Understanding how Rasa works	Chaitanya,Ajinkya,Chint	10-5-19	10-19-19	2	50%
3.3	Creating a basic chatbot in rasa	Chaitanya,Ajinkya,Chint	10-10-19	10-24-19	2	60%
3.4	Adding more College FAQs	Ajinkya,Chaitanya,Chint	1-27-20	3-4-20	1	80%
3.5	Implementing function for accepting	Ajinkya	1-27-20	3-4-20	2	100%
3.6	Implementing LSTM	Chaitanya,Ajinkya	1-27-20	3-4-20	3	70%
3.7	Implementing TF-IDF algorithm	Ajinkya	1-27-20	3-4-20	3	50%
4	**Testing**					
4.1	Design of Test Cases	Ajinkya,Chaitanya,Chint	10-25-19	10-27-19	1	80%
4.2	Testing	Ajinkya,Chaitanya,Chint	10-27-19	10-30-19	1	60%
4.3	Integration testing	Ajinkya,Chaitanya,Chint	1-27-20	3-4-20	2	80%
5	**Results and Analysis**					
5.1	Analysis Of Results	Ajinkya,Chaitanya,Chint	2-27-20	3-4-20	1	100%
5.2	Graphical Representation	Ajinkya,Chintan,Chaitan	2-27-20	3-4-20	1	100%
5.3	Report Preparation	Chintan,Chaitanya,Ajir	05-01-2020	05-08-2020	1	100%

2. Project Design

2.1 Proposed System

- This chatbot will provide answers to all the questions whose answers are predefined in the database.
- The database will be created in the cloud so that whenever we want to make any modifications in our database, we can do it without any difficulty.
- The chatbot will have Artificial Intelligence which will allow it to produce answers for even those question whose answers are not defined.
- The chatbot will be Generative model because of which it will be able to generate new responses from scratch.
- It will be done by using RNN(Recurrent Neural Network) and LSTM (Long Short Term Memory). We will use Rasa Stack for the development of our chatbot.
- Rasa Stack is an open source development tool which provides a platform for developing a chatbot.

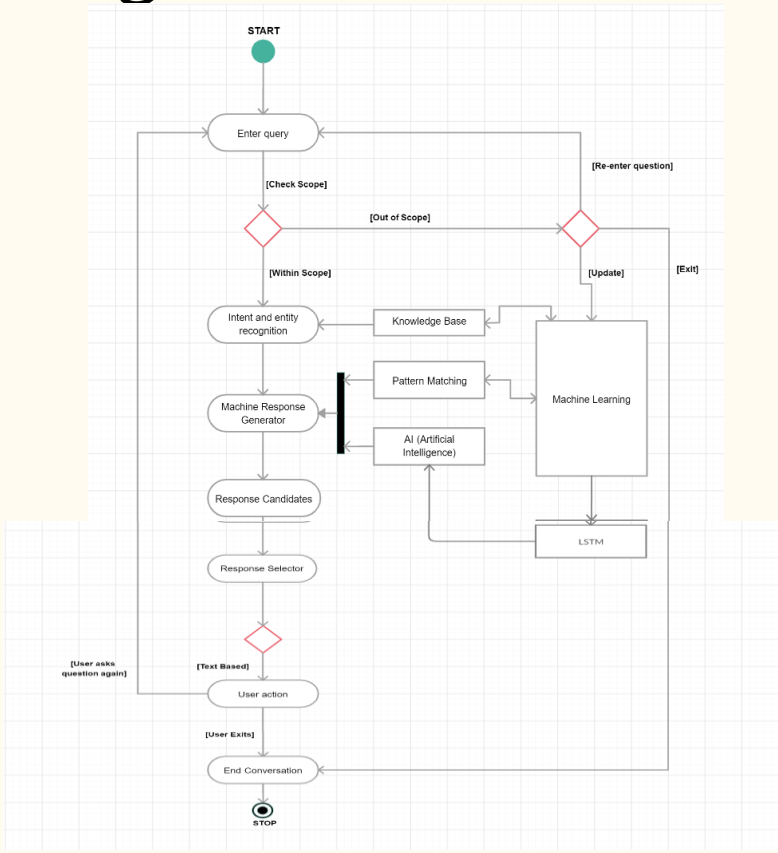
2.2 Design(Flow Of Modules)



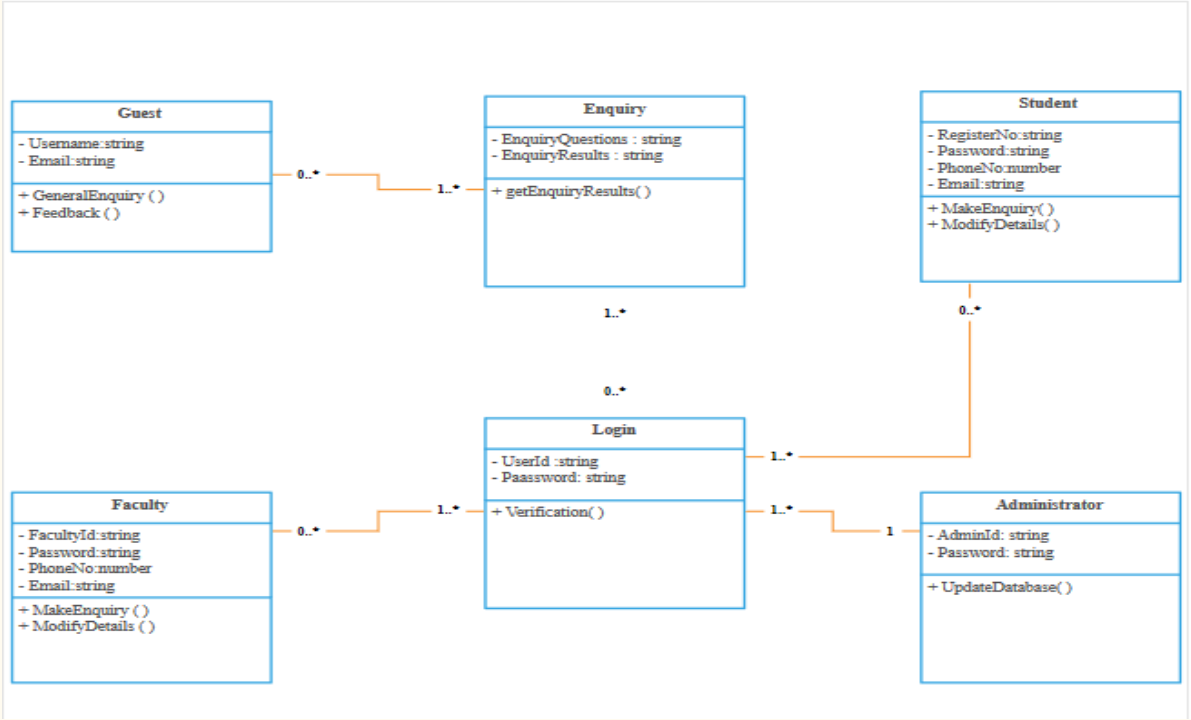
2.3 Description Of Use Case

- User will first type their query to chatbot, Chatbot will check if the answer to that query is available in database or not.
- If the answer to the query is available, it will provide respective answer, If the answer is not present, it will perform pattern matching and artificial intelligence to build an answer and will send an alert to admin to add this query to the database.
- After that it will provide the response and ask if the user has any more query If not the chatbot closes.

2.4 Activity diagram



2.5 Class Diagram



2.6 Installation of Rasa Framework

Step-by-step Installation Guide

- Install the Python development environment
- Create a virtual environment (strongly recommended)
- Install Rasa and Rasa X (Using given Command on terminal)

After Successfully Installing Rasa, Download following Dependencies

- NLU Pipeline Dependencies
- SpaCy Dependencies

Understanding How Rasa works

- AI assistants have to fulfill two tasks: understanding the user and giving the correct responses. The Rasa Stack tackles these tasks with the natural language understanding component Rasa NLU and the dialogue management component Rasa Core.

- Rasa NLU is responsible for natural language understanding of the chatbot. Its main purpose is, given an input sentence, predict an intent of that sentence and extract useful entities from it.

- Rasa Core, It takes structured input in the form of intents and entities and chooses which action the bot should take using a probabilistic model (to be more specific, it uses LSTM neural network implemented in Keras).

Creating a basic Chatbot in Rasa

Extracting User Intent from a Message

The three files we will be using are highlighted above.

1. **data/nlu-data.md :** This is the file where you will save your training data for extracting the user intent.

2. **nlu-config.yml** : This file lets us create a text processing pipeline in Rasa. Luckily for us, Rasa comes with two default settings based on the amount of training data we have: “spacy-sklearn” pipeline if you have less than 1000 training examples “tensorflow_embedding” if you have a large amount of data

3. **domain.md** : It specifies the intents, entities, slots, and actions your bot should know about. Optionally, it can also include responses for the things your bot can say.

Creating a basic Chatbot in Rasa

- Training the NLU classifier
- Predicting the Intent
- Making Interactive Conversations
- Designing the conversational flow
- Defining the Domain
- Setting Policies
- Training the Conversation Model

Future Goals

- Voice can be integrated in custom Rasa Chatbot
- We can include various languages so that we become easy for the user to communicate
- It can be futhur deployed into an android / ios application.

2.7 References

- Nudtaporn Rosruen and Taweesak Samanchuen “Chatbot Utilization for Medical Consultant System”, The 2018 Technology Innovation Management and Engineering Science International Conference(TIMES-iCON2018)
- SathitPrasomphan, “Improvement of Chatbot in Trading System for SMEs by Using Deep Neural Network”,2019IEEE4th International Conference on Cloud Computing and Big Data Analytics.
- Panitan Muangkammuen,Narong Intiruk, Kanda Runapongsa Saikaew, “Automated Thai-FAQ Chatbot using RNN-LSTM”

Thank You