**AI BASED DISCOURSE FOR BANKING INDUSTRY**

# A PROJECT REPORT

***Submitted by***

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*in partial fulfilment for the award of the degree of*

# BACHELOR OF ENGINEERING IN

**COMPUTER SCIENCE AND ENGINEERING**

# KGISL INSTITUTE OF TECHNOLOGY, SARAVANAMPATTI

**ANNA UNIVERSITY :: CHENNAI 600 025**

# ABSTRACT

Chatbot is a computer program that simulates and processes human conversation (either written or spoken), allowing humans to interact with digital devices as if they were communicating with a real person. Chatbot’s can be as simple as rudimentary programs that answer a simple query with a single-line response, or as sophisticated as digital assistants that learn and evolve to deliver increasing levels of personalization as they gather and process information. Chatbot’s boost operational efficiency and bring cost savings to businesses while offering convenience and added services to internal employees and external customers. They allow companies to easily resolve many types of customer queries and issues while reducing the need for human interaction. With chatbot’s, a business can scale, personalize, and be proactive all at the same time—which is an important differentiator. The scope of this project is to develop an AI chatbot to answer college related queries like admissions, course details, etc, using Artificial Intelligence and Machine Learning algorithms. Integrate the chatbot into a website with authentication capabilities.

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# LIST OF ABBREVIATIONS

|  |  |
| --- | --- |
| ML | Machine Language |
| NLP | Natural Language Processing |
| AI | Artificial Intelligence |
| HTML | Hypertext Markup Language |
| CSS | Cascading Style Sheet |
| SQL | Structure Query Language |

* 1. **PROJECT OVERVIEW**

# CHAPTER 1 INTRODUCTION

A chatbot is one of the blooming technologies to interact with users more efficiently. It can be used 24\*7 with the same effect. Chatbot reduces human power and answers queries based on its database collection. Conventionally, to enquire about any banking people either visit the bank physically.

Chatbot, on the other hand, interacts with the users and answers all theories with high efficiency. People only have to update the activities in the database so that chatbot gets trained with the dataset. The authentication factor enables the administrator to identify the hacker who tries to inject any malware websites.

# PURPOSE

## The Banking chatbot allows you to:

## ● Ask query.

## ● Search courses available.

## ● Check the availability of transport.

## ● All the conversations are secured with help of a database.

## ● All the new queries can be monitored by the bot admin.

# CHAPTER 2 LITERATURE SURVEY

* 1. **EXISTING PROBLEM**

In the earlier days, customers had to visit the bank to enquire about details like loan, transaction processess, account details and othin formation's about the bank, which is a tiresome process as well as long process for customers. Nowadays there are many changes occurred in the Banking system with help of advanced technology. Everything is happening over the internet without any trouble. In those days for enquiring about loan we have to visit the bank, but as the days are passing away it’s completing changing. Collecting the loan details, structure manually will be hectic procedure and it also needs manpower. For reducing that manpower and avoid such difficulties and time consuming many devices or systems were emerged day by day.

# REFERENCES

**Conversation to Automation in Banking Through Chatbot Using Artificial Machine Intelligence Language.**

*Sasha Fathima Suhel; Vinod Kumar Shukla; Sonali Vyas; Ved Prakash Mishra*

Deep Chatbot learning: A deep learning chatbot learns

from ground up in a process known "Deep Learning." The

chatbot will be developed using machine learning algorithms in

this process. From his data and human-to-human dialogue, a

deep learning chatbot learns everything [6].

In the Fig 2., it talks about how the general vast types of

chatbots operate where the user types in their input through any

messaging platform being websites or mobile applications

using high level language (Natural Language Processing) being

the normal understanding language used by humans on a daily

basis for communication ,which is then converted to bot logic

through machine learning and then performs the action that

was directed to do or provides the information that the user had

asked for.

**Deep Chatbot learning:** A deep learning chatbot learns from ground up in a process known "Deep Learning." The chatbot will be developed using machine learning algorithms in this process. From his data and human-to-human dialogue, a deep learning chatbot learns everything, it talks about how the general vast types of chatbots operate where the user types in their input through any messaging platform being websites or mobile applications using high level language (Natural Language Processing) being the normal understanding language used by humans on a daily basis for communication.

**A Review of Chatbots in the Banking Sector.**

*Shashank Bairy R , Rashmi R*

**CHATBOTS IN BANKING *-*** Digital banking is being automated currently as it frees up the employees to concentrate on more complex inquiries. Banks are able to automate their customer interactions through chatbots, two-thirds of those surveyed felt that an AI-powered chatbot would be useful in assisting them and 44% would rather communicate with a chatbot than a real person to get their queries answered.

**Chatbots and Virtual Assistant in Indian Banks**

*Singh, Netra & Singh, Devender.*

**Chatbots/ Virtual Assistant**-The Indian banking industry comprises of approximately 20 banks in the public sector, 22 banks in the private sector, 56 regional rural banks, 44 foreign-owned banks, 22 scheduled state cooperatives banks, 11 non-scheduled state cooperatives banks, 54 scheduled urban cooperative banks, 1488 non-scheduled urban cooperative banks and 364 district central cooperative banks. Banks of the public sector dominate approximately 80 per cent of the business share, transmitting relatively small fragments to its private rivals.

**Artificial Intelligence Powered Banking Chatbot**

*K.Satheesh Kumar, S.Tamilselvan, B.Ibrahim Sha, S.Harish*

**Preparing Data Set:** We have started to prepare our own data set as questions and answers that banking customer’s used to ask the bank staffs, at customer care centers or enquiry desks. In this we have referred a number of banking websites and collected FAQs as our data. We have used different web scrapping tools for this task. The following diagram shows the Distribution of questions in the Data-set format. Data-set format: The Queries that customers requested were entered, the entered queries will get the approximate desired answer from the model by using Natural language

***CHATBOT: Architecture, Design, & Development***

**Natural Language Processing** - The goal of natural language processing (NLP) is to take the unstructured output of the ASR and produce a structured representation of the text that contains spoken language understanding (SLU) or, in the case of text input, natural language understanding (NLU). In this section, we explore a number of methods for extracting semantic information and meaning from spoken and written language in order to create grammatical data structures that can be processed by the Dialogue Management unit in the next step. This is non-trivial because speech may contain: (i)identity-specific encodings (e.g. pitch, tone, etc.) in addition to meaning-encodings and (ii) noise from the environment. Likewise, both speech and text inputs to a chatbot may contain (iii)grammatical mistakes, (iv) disfluencies, (v) interruptions, and (vi) self-corrections**.**

# PROBLEM STATEMENT DEFINITON

Banking related Chatbot is simply a chatbot that responds to user queries. UI plays a major role in this Project. The flexible UI makes the web app easily interact with the Client. AI-powered chatbot used for enquiring and helps people to sort out a clear idea about banking activities and transaction processes. Clearly defines the Banking activities like loan details, transaction process, general bank query.

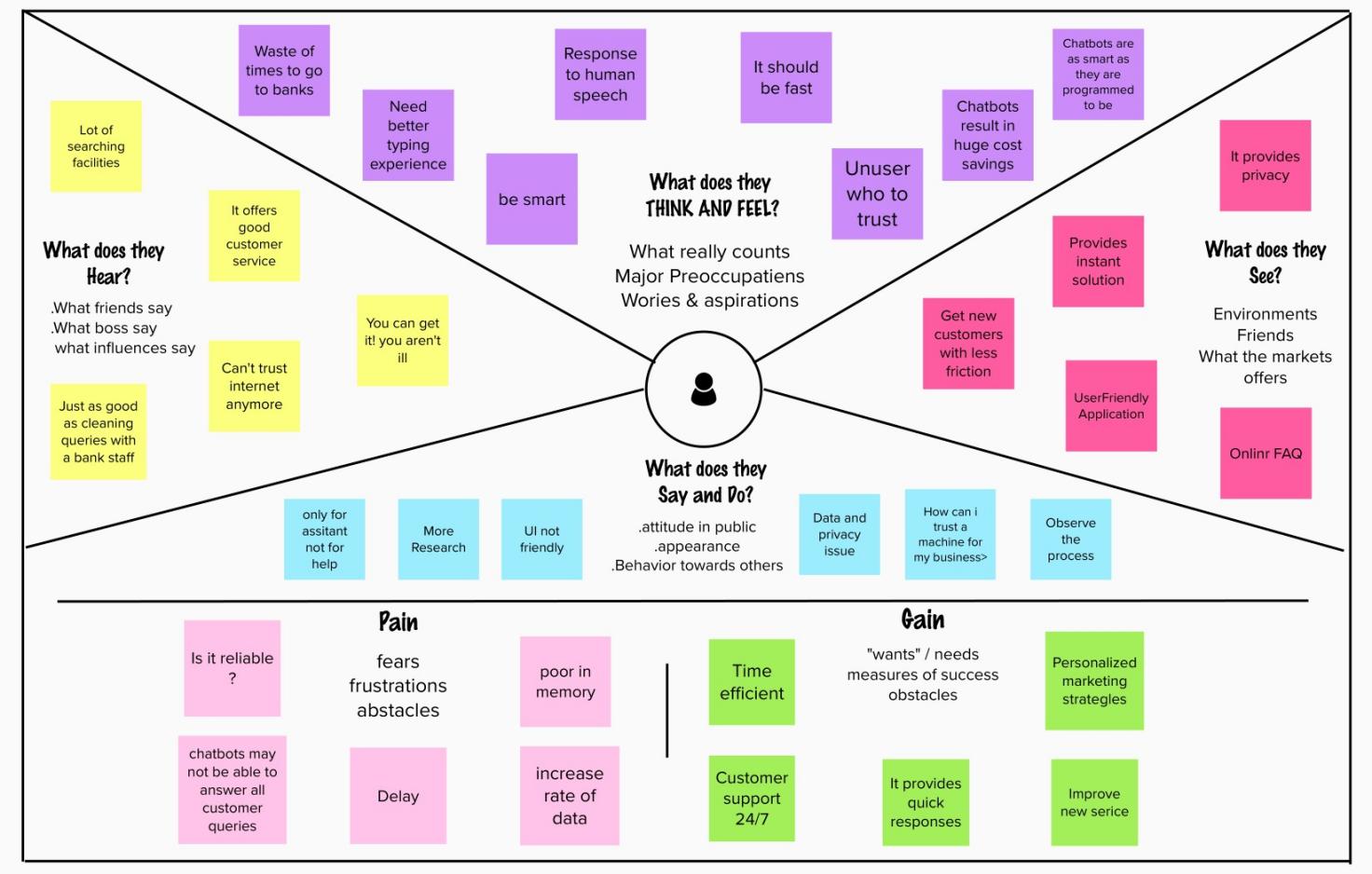
# CHAPTER 3

**IDEATION AND PROPOSED SOLUTION**

# EMPATHY MAP CANVAS

An empathy map is a simple, easy-to-digest visual that captures knowledge about a user’s behaviours and attitudes. It is a useful tool to helps teams better understand their users. Creating an effective solution requires understanding the true problem and the person who is experiencing it. The exercise of creating the map helps participants consider things from the user’s perspective along with his or her goals and challenges.

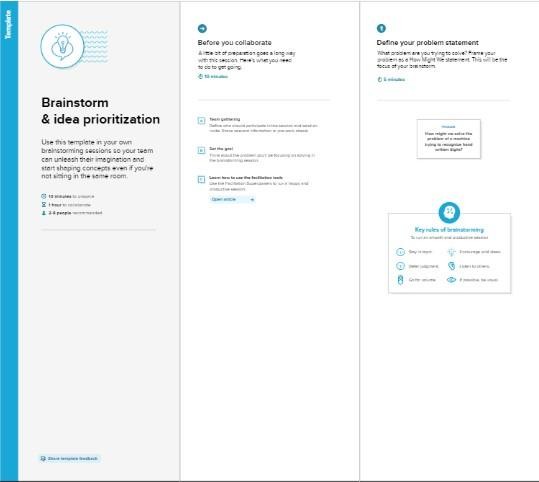
Users think that these types of applications should have a very simple interface and need to be visually appearing for them to use, these can be also given to them as a mobile application for easy access. They feel that the application is very exciting as the digits are recognized but are confused whether they need these types of applications. They start trying to check the application by feeding various inputs get fascinated by the output produced by the application and then start recommending the application to their colleagues. Even though the application reduces the manual work and increase the efficiency of recognizing the digit, users thinks that there are few disadvantages also. Users feel that they may accidentally upload some sensitive files and taking photos of the digits is very annoying.



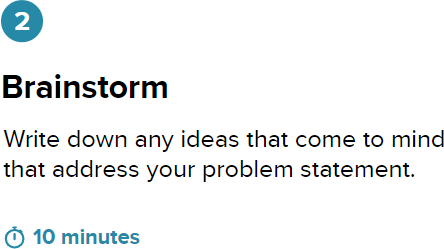
# IDEATION AND BRAINSTORMING

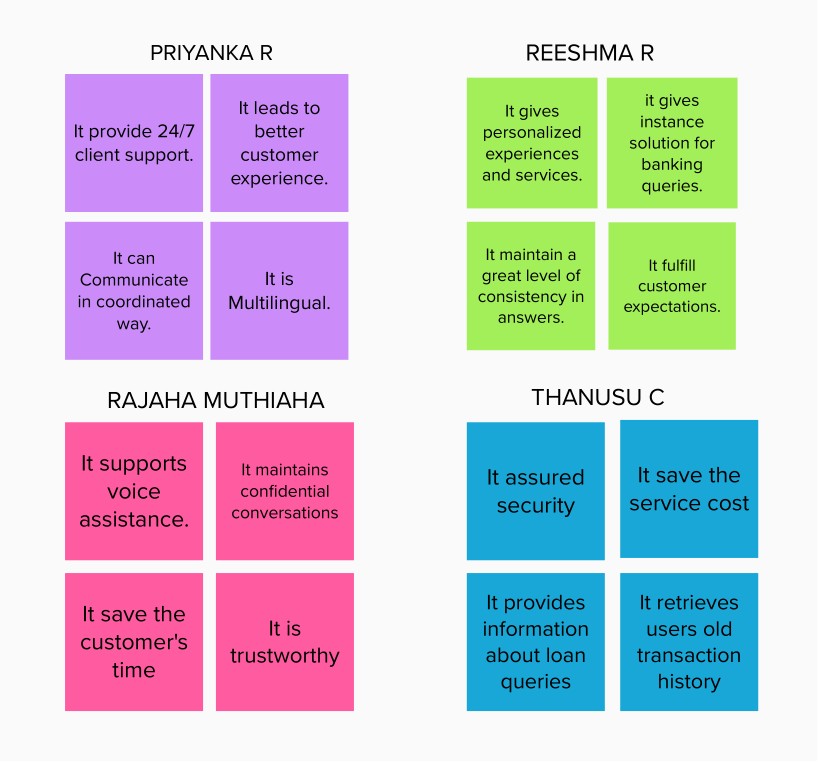
Brainstorming provides a free and open environment that encourages everyone within a team to participate in the creative thinking process that leads to problem solving. Prioritizing volume over value, out-of-the-box ideas are welcome and built upon, and all participants are encouraged to collaborate, helping each other develop a rich number of creative solutions.

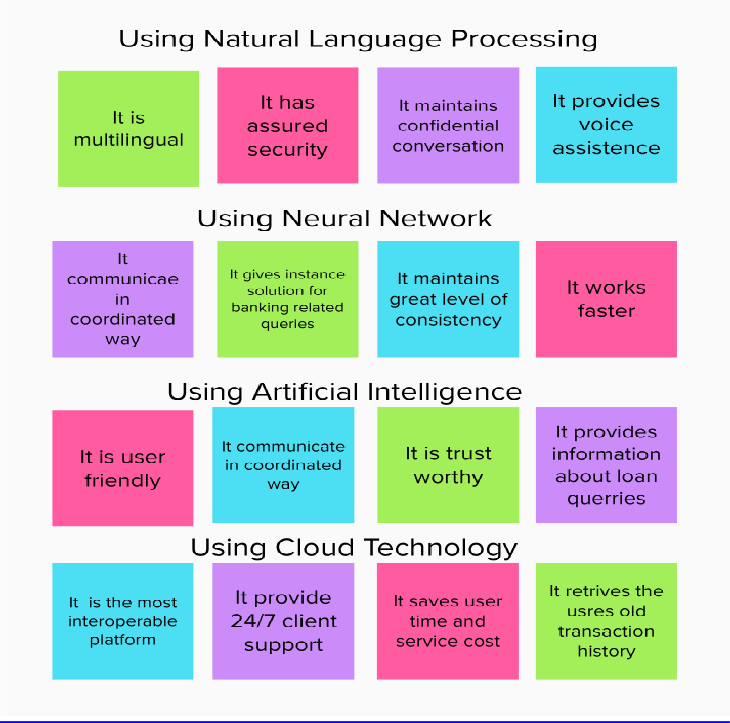
## Step-1: Team Gathering, Collaboration and Select the Problem Statement

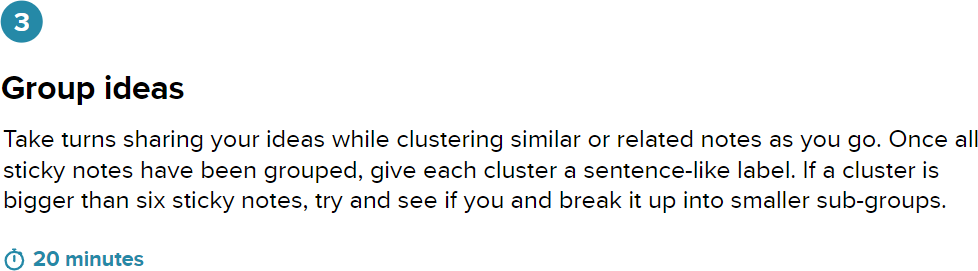


**Step-2: Brainstorm, Idea Listing and Grouping**

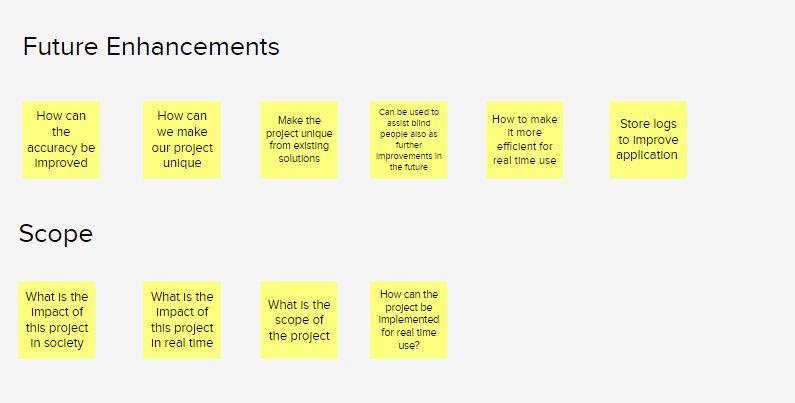


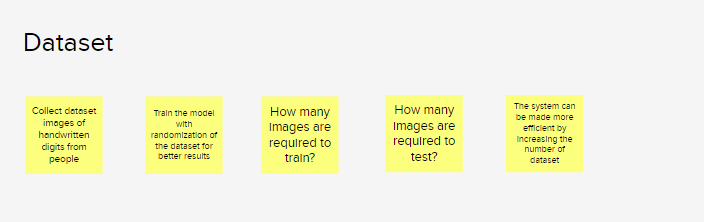




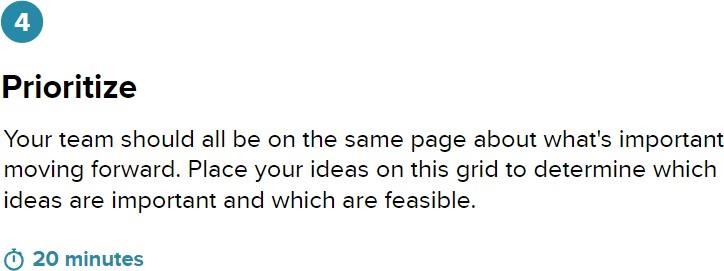


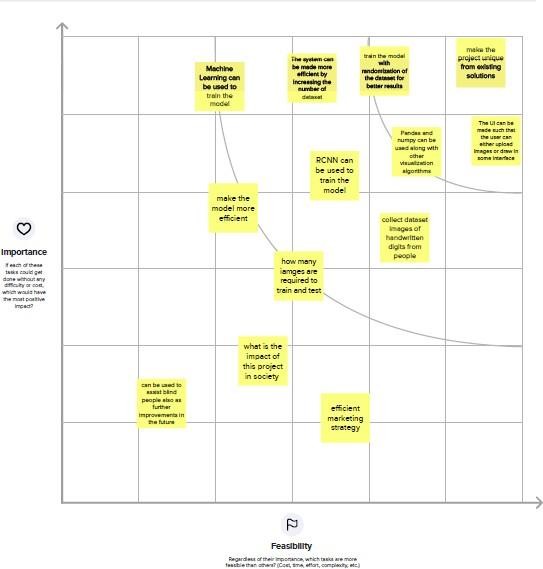






**Step-3: Idea Prioritization**





# PROPOSED SOLUTION

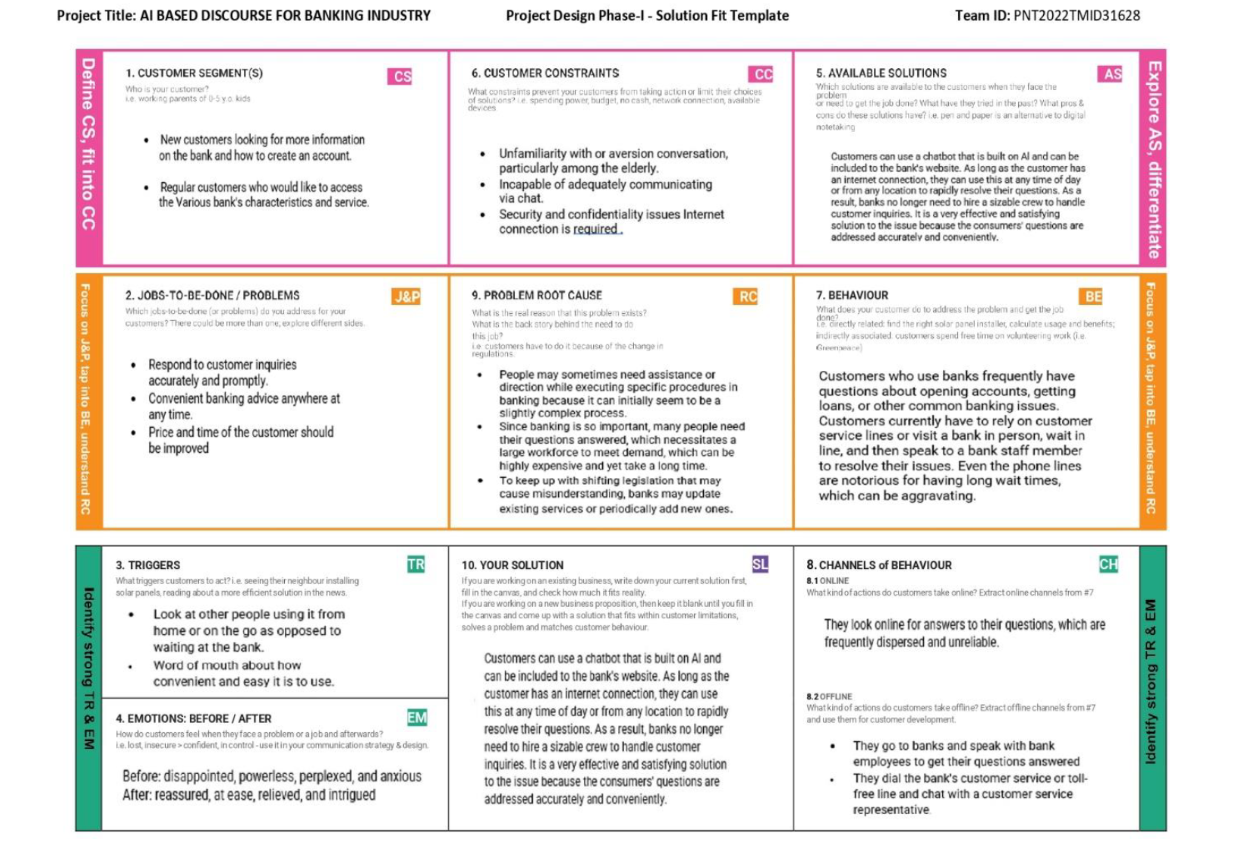
Chatbot is a computer program that simulates and processes human conversation(either written or spoken), allowing humans to interact with digital devices as if they were communicating with a real person. Chatbot’s can be as simple as rudimentary programs that answer a simple query with a single-line response, or as sophisticated as digital assistants that learn and evolve to deliver increasing levels of personalization as they gather and process information.

Chatbot’s boost operational efficiency and bring cost savings to businesses while offering convenience and added services to internal employees and external customers. They allow companies to easily resolve many types of customer queries and issues while reducing the need for human interaction. With chatbots, a business can scale, personalize, and be proactive all at the same time—which is an important differentiator. The scope of this project is to develop an AI chatbot to answer banking-related queries like loan details, transaction processes account details, etc., using Artificial Intelligence and Machine Learning algorithms. Integrate the chatbot into a website with authentication capabilities.

# PROBLEM SOLUTION FIT

The Problem-Solution Fit means that we have found a problem with our customer and that the solution we have realized for it actually solves the customer’s problem. It helps entrepreneurs, marketers and corporate innovators identify behavioural patterns and recognize what would work and why. Few purposes of Problem-Solution Fit are:

* + - It can be used to solve complex problems in a way that fits the state of our customers
    - Succeed faster and increase our solution adoption by tapping into existing mediums and channels of behaviour
    - Sharpen our communication and marketing strategy with the right triggers and messaging
    - Increase touch-points with our company by finding the right problem-behaviour fit and building trust by solving frequent annoyances, or urgent or costly problems
    - Understand the existing situation in order to improve it for our target group



# CHAPTER 4 REQUIREMENT ANALYSIS

* 1. **FUNCTIONAL REQUIREMENTS**

|  |  |  |
| --- | --- | --- |
| **FR.NO** | **FUNCTIONAL**  **REQUIREMENTS** | **SUB REQUIREMENTS** |
| FR-1 | Savings Account Related Actions | * Type of Savings Account Creation Details * Interest Rate * Minimum Balance * Debit Card * Credit Card |
| FR-2 | Current Account Related Actions | * Type of Company * Current Account Closure Steps * Update GSTIN * Zero Balance Current Account |
| FR-3 | Loan Account Related Actions | * Type of Loan * How long for approval * Available Loan Amounts * Loan Status * Joint Loan |
| FR-4 | General Queries Related Actions | * Bank Working Days * List of Braches * Storage Locker Facility * Currency Conversion Facility * CIBIL * Find a nearest branch |
| FR-5 | Net Banking Related Actions | * Login Steps * Change Net Banking Password * Daily Limit * Types of Fund Transfer * Add Beneficiary |

# NON-FUNCTIONAL REQUIREMENTS

|  |  |  |
| --- | --- | --- |
| **FR.NO** | **NON-FUNCTIONAL**  **REQUIREMENTS** | **DESCRIPTION** |
| NFR-1 | Usability | Chatbots developed using AI should be able to answer any general banking queries on account creation, loan, net banking, other services etc. It addresses the queries of customers immediately and effectively in a cost-efficient manner. |
| NFR-2 | Security | The AI Chatbot maintains a confidential conversation with customers. Chatbot will provide personal and efficient communication between the user and the bank. |
| NFR-3 | Reliability | Chatbots are trained very well using AI to provide solutions for the popular and frequently asked questions, thereby providing the best suited service quickly. AI Chatbots has a reliable end-user experience. |
| NFR-4 | Performance | AI Chatbots is a great way to overcome the limitation of workload of humans. There can be multiple instances of a single chatbot inquiring different people at the same time. Such chatbots work in real time with no need for the customers to wait. This ensures faster, easier and more efficient  face-time with customers. |
| NFR-5 | Availability | AI Chatbots provides 24/7 service to clear all customer queries and guide them through all the banking processes. It is available to anyone with access to the internet with basic hardware. |
| NFR-6 | Scalability | AI Chatbots is helping banking industry to scale their customer service and to improve customer service satisfaction at the same time. It can be scaled as per the requirements of the bank to include answers to queries related to any new feature or service introduced by the bank. |

**CHAPTER 5 PROJECT DESIGN**

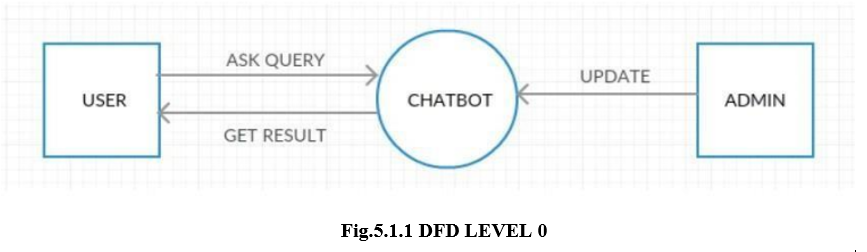
# DATA FLOW DIAGRAM

Data flow diagram is used to describe how the information is processed and stored and identifies how the information flows through the processes. Data flow diagram illustrates how the data is processed by a system in terms of inputs and outputs. The data flow diagram also depicts the flow of the process and it has various levels. The initial level is context level which describes the entire system functionality and the next level describes each and every sub module in the main system as a separate process or describes all the process involved in the system separately. Data flow diagram are made up of number of symbols,

|  |
| --- |
| Square presenting external entities, which are sources or destination of data |
| Circle representing processes, which take data as input, do something to it and output it |
| Arrow representing the data flows, which can either be electronic data or physical items |
| Parallel lines representing data stores, including electronic stores such as databases or XML files and physical stores |

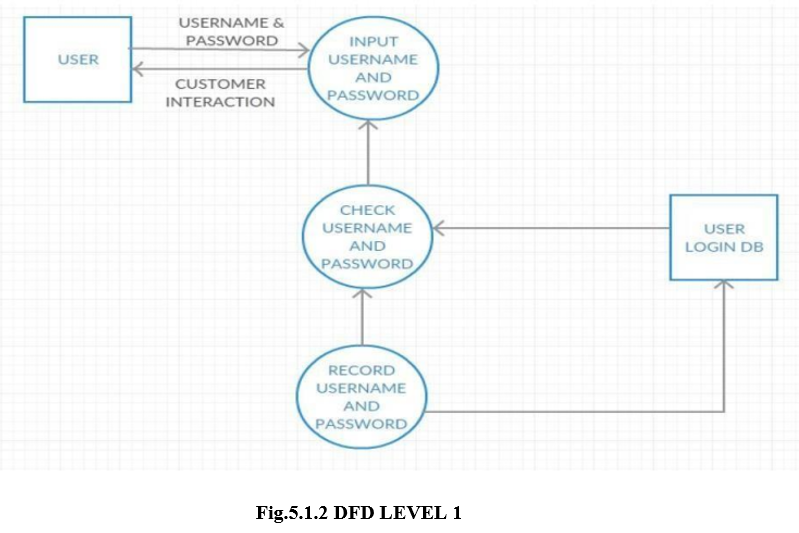
# DFD LEVEL 0

The users of the system upload an image in the web application to recognize the handwritten digits in it. The image is feed into a model for recognition and the answer is sent back to the web application.



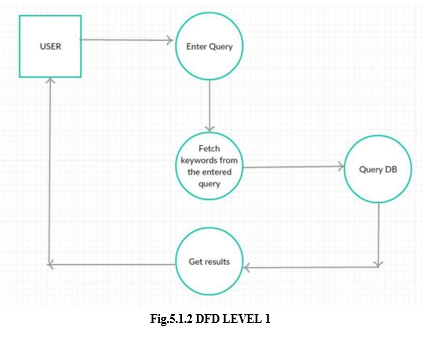
# DFD LEVEL 1

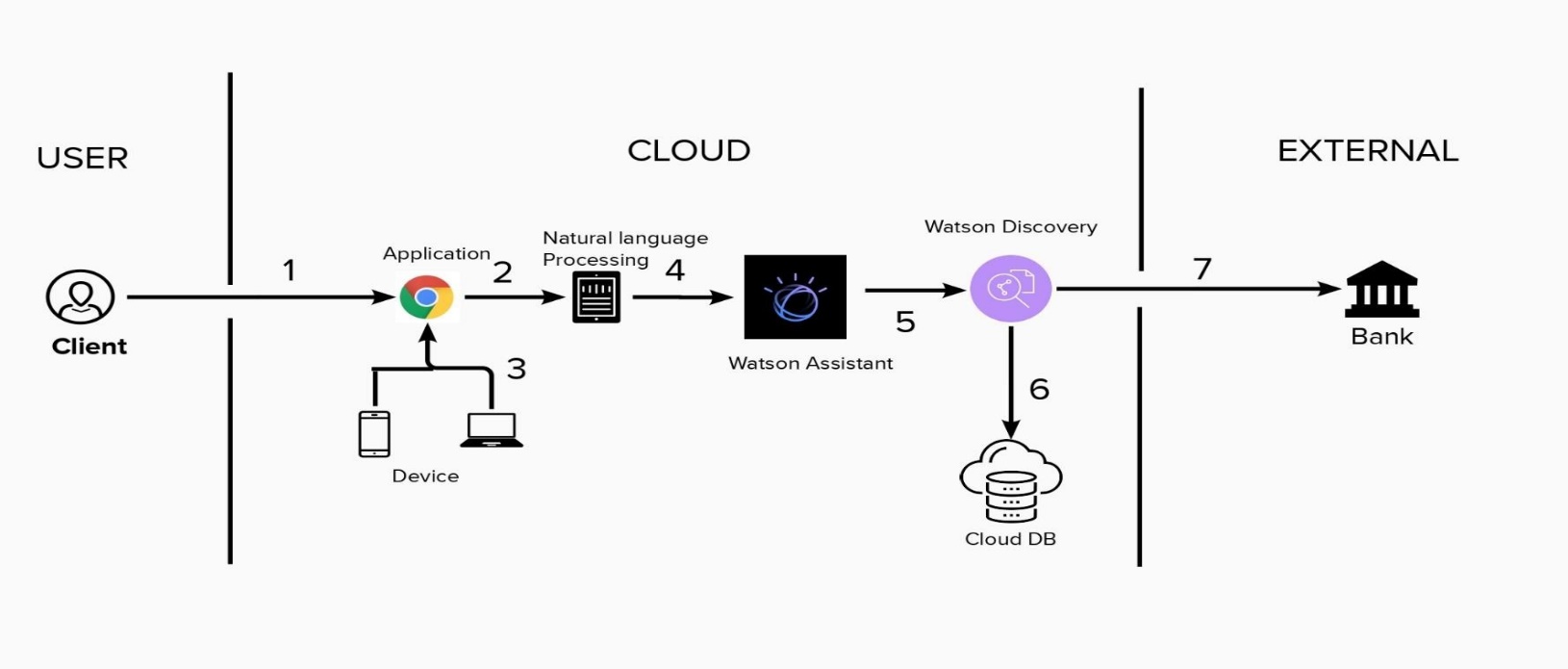
The image uploaded by the user is initially stored in the image database, then image is pre-processed for recognition. The processed data is sent into the model to predict the result. Finally, the output is displayed in the web application.



# DFD LEVEL 2

CNN Model is first trained with the MNIST dataset, then processed image is sent into the model which passes through various layers present in the CNN Model for further processing then the digit is recognized.





# SOLUTION AND TECHNICAL ARCHITECTURE

* 1. **USER STORIES**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **User Type** | **Functional Requirement (Epic)** | **User Story Number** | **User Story / Task** | **Acceptance criteria** | **Priority** | **Release** |
| Customer  (Mobile or Web user) | Savings  Account  Related  Actions | USN-1 | As a user, in the Savings Account option, I can select Types of Savings Account to get details regarding documents required for creating those savings accounts. | I can clear my queries regarding  types of savings  account | High | Sprint-1 |
|  |  | USN-2 | As a user, I can check the Interest Rates of Savings Account | I can clear my queries regarding  interest rates of savings account | High | Sprint-1 |
|  |  | USN-3 | As a user, I can check the Minimum  Balance of Savings Account | I can clear my queries  regarding  minimum  balance of  savings  account | Medium | Sprint-2 |
|  | Current  Account  Related  Actions | USN-4 | As a user, I can choose the Type of Companies that know the information on  documents to be submitted for creating  current account | I can clear my queries  regarding  types of  companies | High | Sprint-1 |
|  |  | USN-5 | As a user, I want to get details on the Procedure to close my Current Account | I can clear my queries regarding  current account  closure | High | Sprint-2 |
|  | Loan  Account  Related  Actions | USN-6 | As a user, I can choose the Type of Loan to know the information on  choosing an essential  loan scheme | I can clear my queries  regarding types of loan account | High | Sprint-1 |
|  |  | USN-7 | As a user, I can check the loan Amounts that can be offered for corresponding Loan Accounts chosen | I can clear my queries regarding  loan amounts of loan account | High | Sprint-2 |
|  |  | USN-8 | As a user, I can check the Status of Loans for my Loan Accounts | I can clear my queries  regarding the loan status the of loan account | Low | Sprint-2 |
|  | General  Queries  Related  Actions | USN-9 | As a user, I want to get the procedure details for Currency Conversion  the facility of my bank account | I can clear my queries  regarding  currency  conversion  facilities of  bank account | Low | Sprint-1 |
|  |  | USN-10 | As a user, I want to check my CIBIL score for my loan application and to  ensure that my loan application is  approved by the bank. | I can clear my queries regarding  CIBIL score of loan application | Medium | Sprint 3 |
|  |  | USN-11 | As a user, I want to get the procedure details for maintaining the Storage Locker the facility of my bank account | I can clear my queries  regarding storage  locker facilities of  bank account | High | Sprint-3 |

# CHAPTER 6

**PROJECT PLANNING AND SCHEDULING**

# 6.1 SPRINT PLANNING AND ESTIMATION

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sprint** | **Functional Requirement (Epic)** | **User Story Number** | **User Story / Task** | **Story Points** | **Priority** | **Team Members** |
| Sprint-1 | Savings Account-Related Actions | USN-1 | As a user, in the Savings Account option, I can select Types of Savings Account to get details regarding documents required for creating that savings account. | 4 | High | REESHMA R THANUSU C |
| Sprint-1 |  | USN-2 | As a user, I can check the Interest Rates of Savings Account | 4 | High | THANUSU C  PRIYANK R |
| Sprint-1 |  | USN-3 | As a user, I can check the Minimum Balance of my Savings Account | 3 | Medium | THANUSU C |
| Sprint-1 | Current Account-Related Actions | USN-4 | As a user, I can choose the Type of Company to know the information on documents to be  submitted for creating a current account | 5 | High | REESHMA R |
| Sprint-1 |  | USN-5 | As a user, I want to get details on the procedure to close my Current Account | 4 | High | REESHMA R |
| Sprint-2 | Loan Account-Related Actions | USN-6 | As a user, I can choose the Type of Loans to know the information on choosing an essential loan scheme | 3 | High | RAJAHA MUTHIAHA C |
| Sprint-2 |  | USN-7 | As a user, I can check the Loan Amounts that can be offered for corresponding Loan Accounts  chosen | 3 | High | RAJAHA MUTHIAHA C |
| Sprint-2 |  | USN-8 | As a user, I can check the Status of Loans for my Loan Accounts | 1 | Low | PRIYANKA R |
| Sprint-2 | General Queries Related Actions | USN-9 | As a user, I want to get the procedure details for  Currency Conversion facility of my bank account | 2 | Medium | PRIYANKA R |
| Sprint-2 | General Queries Related Actions | USN-9 | As a user, I want to get the procedure details for  Currency Conversion facility of my bank account | 2 | Medium | PRIYANKA R |
| Sprint-2 |  | USN-10 | As a user, I want to check my CIBIL score for my loan application and to ensure whether my loan application is approved by the bank. | 1 | Low | PRIYANKA R |
| Sprint-2 |  | USN-11 | As a user, I want to get the procedure details for maintaining Storage Locker facility of my bank account | 3 | High | RAJAHA MUTHIAHA C |
| Sprint-2 | Net Banking Related Actions | USN-12 | As a user, I want to get the procedure details for  changing the Net Banking password of my bank account | 3 | High | REESHMA R |
| Sprint-2 |  | USN-13 | As a user, I can select types of fund transfers to get details regarding different services available in net banking | 2 | Medium | THANUSU C |
| Sprint-2 |  | USN-14 | As a user, I want to get the procedure details for adding beneficiaries to my net banking account. | 2 | Medium | THANUSU C  REESHMA R |
| Sprint-3 | Web Application | USN-15 | As a user, I want to access the chatbot in a web browser that can be accessed from almost all devices. | 20 | High | RAJAHA MUTHIAHA C  PRIYANKA R |
| Sprint-4 | User Interface and Web Pages | USN-16 | As a user, I want to view pages of the banking website and have access to the chatbot easily. | 20 | High | THANUSU C  REESHMA R |

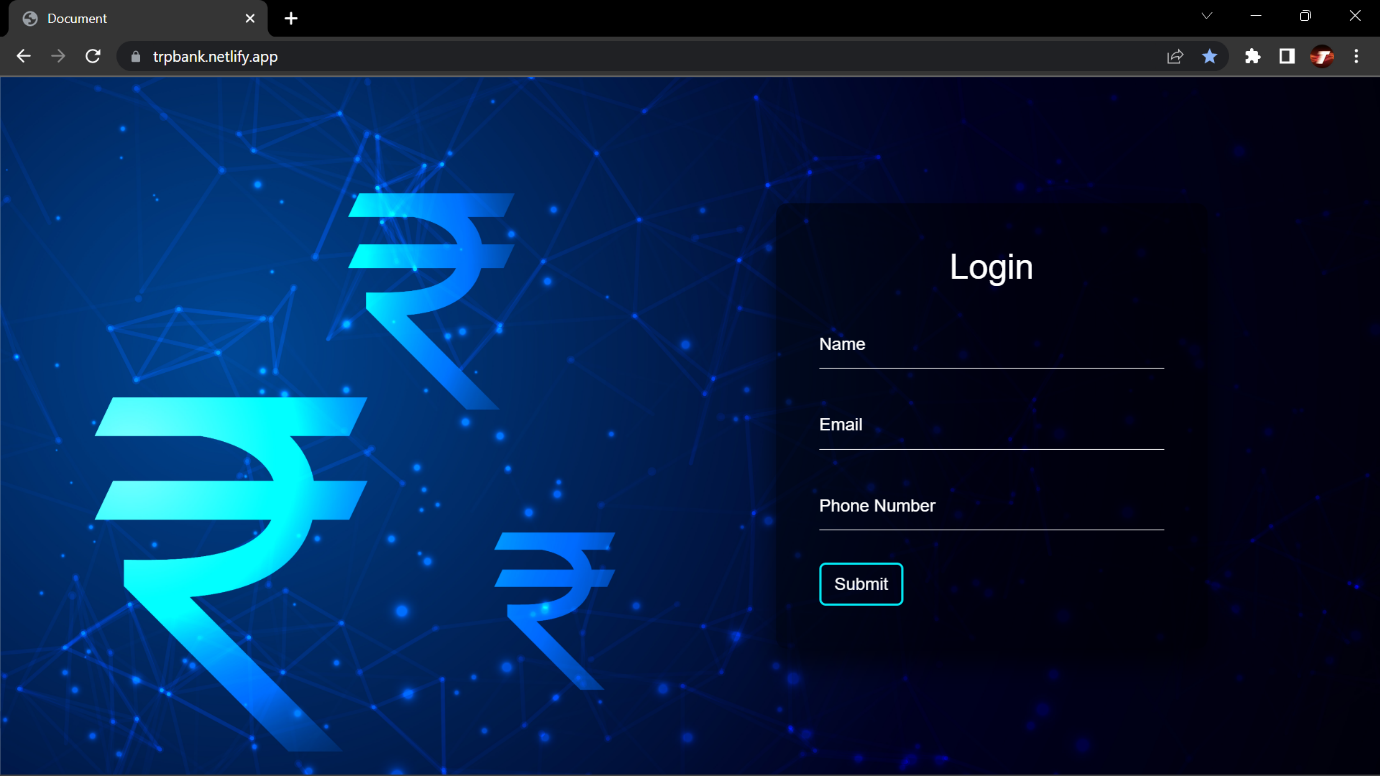
* 1. **SPRINT DELIVERY SCHEDULE**

| **Sprint** | **Total Story Points** | **Duration** | **Sprint Start Date** | **Sprint End Date (Planned)** | **Story Points Completed** | **Sprint Release Date (Actual)** |
| --- | --- | --- | --- | --- | --- | --- |
| Sprint-1 | 11 | 6 Days | 24 Oct 2022 | 29 Oct 2022 | 11 | 29 Oct 2022 |
| Sprint-2 | 9 | 6 Days | 31 Oct 2022 | 05 Nov 2022 | 9 | 05 Nov 2022 |
| Sprint-3 | 10 | 6 Days | 07 Nov 2022 | 12 Nov 2022 | 10 | 12 Nov 2022 |
| Sprint-4 | 9 | 6 Days | 14 Nov 2022 | 19 Nov 2022 | 9 | 19 Nov 2022 |

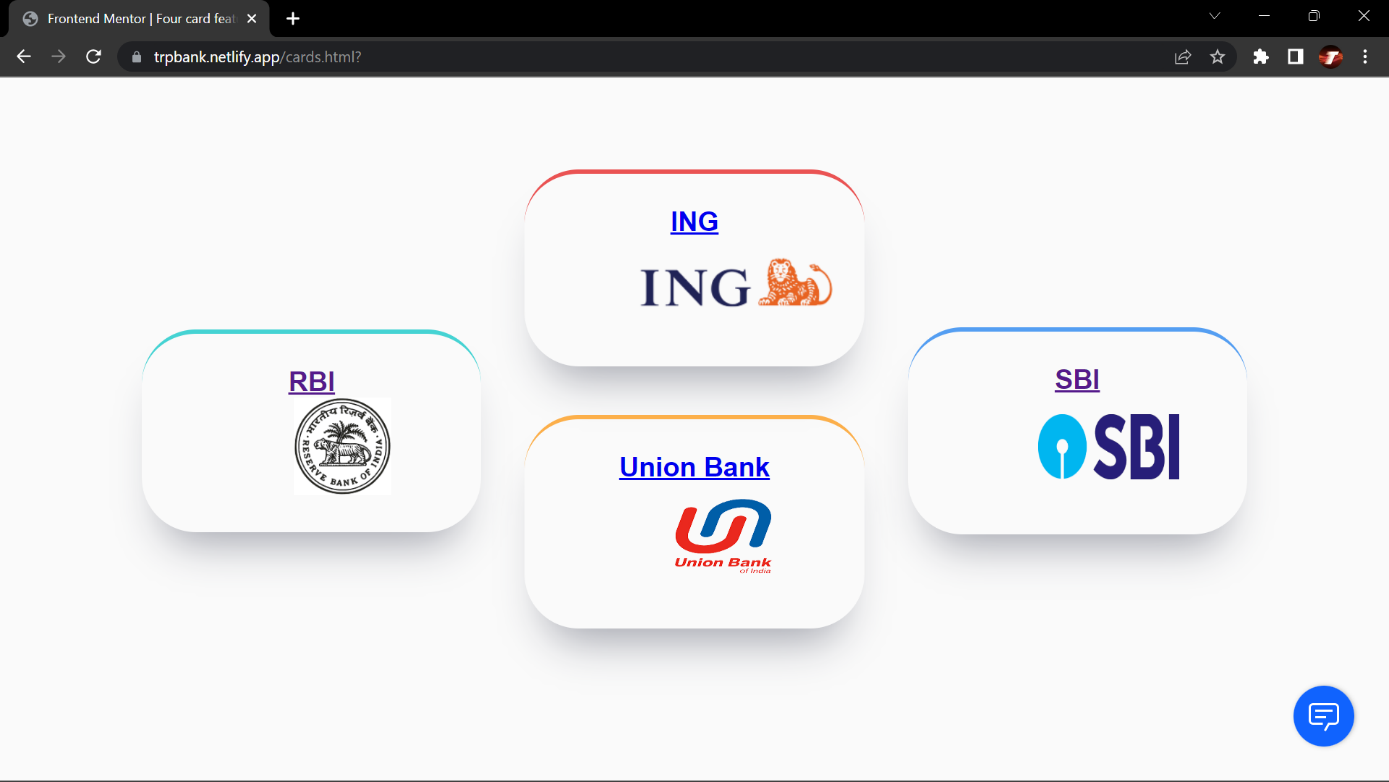
# 

# CHAPTER 7 CODING AND SOLUTIONIN

# FEATURE 1



* 1. **FEATURE 2**



* 1. **TEST CASES**

# CHAPTER 8 TESTING

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TEST**  **CASE ID** | **FEATURE TYPE** | **COMPONENT** | **TEST SCENARIO** | **EXPECTED RESULT** | **ACTUAL RESULT** | **STATUS** |
| TC\_001 | UI | Home Page | Verify user is able to see the chatbot icon when website is launched | It should show the chatbot icon | Working as expected | PASS |
| TC\_002 | UI | Home Page | URL of the bank's website | It should display the home page | Working as expected | PASS |
| TC\_003 | Functional | Chatbot | Verify user is able to receive dynamic greeting message | It should be popup when clicking of the bot icon | Working as expected | PASS |
| TC\_004 | Functional | Backend | Check if all routes are working properly | It should store the form data  In the database | Working as expected | PASS |
| TC\_005 | Functional | Chatbot | Verify user is able to select the action suggested by chatbot | It should list the queries and display the answer | Working as expected | PASS |
| TC\_006 | Functional | Chatbot | Verify user is able to type query in text field. | it should allow the user to type the queries | Working as expected | PASS |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| TC\_007 | Functional | Chatbot | Verify user is able to get the response from chatbot | It should process the query of user | Working as expected | PASS |
| TC\_008 | Functional | Chatbot | Verify user to display the general queries | It should display the list of queries | Working as expected | PASS |
| TC\_009 | Functional | Chatbot | Verify the answer of the net banking details | It should display the net banking details | Working as expected | PASS |

* 1. **USER ACCEPTANCE TESTING**

Acceptance Testing is a level of the software testing where a system is tested for acceptability. The purpose of this test is to evaluate the system’s compliance with the business requirements and assess whether it is acceptable for delivery. Formal testing with respect to user needs, requirements, and business processes conducted to determine whether or not a system satisfies the acceptance criteria and to enable the user, customers or other authorized entity to determine whether or not to accept the system. In this application, the customer’s acceptance is been monitored and it is been put into usage.

# TEST CASE ANALYSIS

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **SECTION** | **TOTAL CASES** | **NOT TESTED** | **FAIL** | **PASS** |
| Print Engine | 5 | 0 | 1 | 4 |
| Client Application | 1 | 0 | 0 | 1 |
| Performance | 3 | 0 | 0 | 3 |
| Exception Reporting | 1 | 0 | 0 | 1 |

**CHAPTER 9 RESULTS**

# 9.1 PERFORMANCE METRICS

|  |  |  |  |
| --- | --- | --- | --- |
| **S.No** | **PARAMETER** | **VALUES** | **SCREENSHOT** |
| **1** | **MODEL SUMMARY** | The chatbot is used by the user to interact and select queries that are populated based on frequently asked question of banking customers. There can be multiple instances of a single chatbot inquiring different user at the same time. It quickly responds with expected answers to frequently asked customer queries. It can be scaled as per the requirements of the bank to include answers to queries related to any new feature or service introduced by the bank. |  |
| **2.** | **ACCURACY** | Training Accuracy – 100% Validation Accuracy – 100% |  |

**CHAPTER 10 ADVANTAGES AND DISADVANTAGES**

# ADVANTAGES

# Round-the-clock service.

# Brand Consistency.

# Increased Productivity.

# Reduced Staffing Needs.

# Consistent Response Rate and Availability.

# Helps with Fraud Prevention.

# Chats can be saved.

# Lower costs.

# DISADVANTAGES

* + - Questions must be programmed beforehand.
    - Impersonal
    - Must keep information up-to-date.
    - Technology issues.
    - Needs additional measures to protect identities.

# CHAPTER 11 CONCLUSION

As we can see, chatbots and other types of AI assistants are of great use in any industry that has to provide high-quality customer support. One such industry is the finance or banking area, and it is rapidly integrating these technologies into its workflow. Banking is all about money and reputation, and AI chatbots offer numerous benefits for both.

# CHAPTER 12 FUTURE SCOPE

In the future, application can be improved with following features:

* This project is focused on bot that easly intract with the user.
* The future enhancements can be done by using the voice recognition mechanism
* The bot can be deployed in various social channels and it can be made to implement in different languages

**CHAPTER 13**

**APPENDIX**

**13.1 SOURCE CODE**

**App.py:**

from flask import Flask, render\_template

app = Flask(\_\_name\_\_)

@app.route('/')

def login():

return render\_template("index.html")

@app.route('/base' )

def login1():

return render\_template("base.html")

@app.route('/cards' )

def login2():

return render\_template("cards.html")

if \_\_name\_\_ == '\_\_main\_\_':

app.run(debug=True)

**Index.html:**

<!DOCTYPE html>

<html lang="en">

<head>

<meta charset="UTF-8">

<meta http-equiv="X-UA-Compatible" content="IE=edge">

<meta name="viewport" content="width=device-width, initial-scale=1.0">

<link href="https://cdn.jsdelivr.net/npm/bootstrap@5.2.0-beta1/dist/css/bootstrap.min.css" rel="stylesheet" integrity="sha384-0evHe/X+R7YkIZDRvuzKMRqM+OrBnVFBL6DOitfPri4tjfHxaWutUpFmBp4vmVor" crossorigin="anonymous">

<title>Index</title>

<style>

html {

height: 100%;

}

body {

margin:0;

padding:0;

font-family: sans-serif;

background: linear-gradient(#141e30, #243b55);

}

.login-box {

position: absolute;

top: 50%;

left: 100%;

width: 400px;

padding: 40px;

transform: translate(-140%, -50%);

background: rgba(0,0,0,.5);

box-sizing: border-box;

box-shadow: 0 15px 25px rgba(0,0,0,.6);

border-radius: 10px;

}

.login-box h2 {

margin: 0 0 30px;

padding: 0;

color: #fff;

text-align: center;

}

.login-box .user-box {

position: relative;

}

.login-box .user-box input {

width: 100%;

padding: 10px 0;

font-size: 16px;

color: #fff;

margin-bottom: 30px;

border: none;

border-bottom: 1px solid #fff;

outline: none;

background: transparent;

}

.login-box .user-box label {

position: absolute;

top:0;

left: 0;

padding: 10px 0;

font-size: 16px;

color: #fff;

pointer-events: none;

transition: .5s;

}

.login-box .user-box input:focus ~ label,

.login-box .user-box input:valid ~ label {

top: -20px;

left: 0;

color: #03e9f4;

font-size: 12px;

}

.login-box form a {

position: relative;

display: inline-block;

padding: 10px 20px;

color: #03e9f4;

font-size: 16px;

text-decoration: none;

text-transform: uppercase;

overflow: hidden;

transition: .5s;

margin-top: 40px;

letter-spacing: 4px

}

.login-box a span {

position: absolute;

display: block;

}

.login-box a span:nth-child(1) {

top: 0;

left: -100%;

width: 100%;

height: 2px;

background: linear-gradient(90deg, transparent, #03e9f4);

animation: btn-anim1 1s linear infinite;

}

.login-box a span:nth-child(2) {

top: -100%;

right: 0;

width: 2px;

height: 100%;

background: linear-gradient(180deg, transparent, #03e9f4);

animation: btn-anim2 1s linear infinite;

animation-delay: .25s

}

.login-box a span:nth-child(3) {

bottom: 0;

right: -100%;

width: 100%;

height: 2px;

background: linear-gradient(270deg, transparent, #03e9f4);

animation: btn-anim3 1s linear infinite;

animation-delay: .5s

}

.login-box a span:nth-child(4) {

bottom: -100%;

left: 0;

width: 2px;

height: 100%;

background: linear-gradient(360deg, transparent, #03e9f4);

animation: btn-anim4 1s linear infinite;

animation-delay: .75s

}

.btn{

display: inline-block;

border: 2px solid #03e9f4;

}

</style>

</head>

<body>

<div class="rp">

<img src="/static/ii.jpg" class="card-img-top thumb position-fixed"/>

</div>

<div class="login-box">

<h2>Login</h2>

<form name="myForm" >

<div class="user-box">

<input type="text" id="username" name="username" required>

<label>Name</label>

</div>

<div class="user-box">

<input type="email" id="email" name="email" required>

<label>Email</label>

</div>

<div class="user-box">

<input type="phone\_number" id="phone\_number" name="Phone Number" required>

<label>Phone Number</label>

</div>

<div class="user-box">

<button id="saveData" class="btn btn-outline-light" type="submit" value="Login">Submit</button>

</div>

</form>

</div>

<script type="module">

import { initializeApp } from "https://www.gstatic.com/firebasejs/9.8.3/firebase-app.js";

import { getDatabase, ref, set } from "https://www.gstatic.com/firebasejs/9.8.3/firebase-database.js";

const firebaseConfig = {

apiKey: "AIzaSyDwQuixdxrFpb-NEz1e9KfUEn30M3s1-40",

authDomain: "trpbank-c9cba.firebaseapp.com",

databaseURL: "https://trpbank-c9cba-default-rtdb.firebaseio.com",

projectId: "trpbank-c9cba",

storageBucket: "trpbank-c9cba.appspot.com",

messagingSenderId: "114953945978",

appId: "1:114953945978:web:68af5e48197747f48e4cc3",

measurementId: "G-2QVBJY3L63"

};

// Initialize Firebase

const app = initializeApp(firebaseConfig);

const database = getDatabase(app);

saveData.addEventListener('click',(e) => {

var username = document.getElementById('username').value;

var email = document.getElementById('email').value;

var phone\_number = document.getElementById('phone\_number').value;

var today = new Date();

var time = today.getHours() + ":" + today.getMinutes() + ":" + today.getSeconds();

set(ref(database, 'users/' + username), {

username: username,

email: email,

phone\_number : phone\_number,

date : today,

time : time

});

document.getElementById('username').value="";

document.getElementById('email').value="";

document.getElementById('phone\_number').value="";

alert('Details saved');

setTimeout(function(){

window.location = '/base';

}, 2000);

});

</script>

</body>

</html>

**Base.html:**

<!DOCTYPE html>

<html lang="en">

<head>

<meta charset="UTF-8">

<title>TRP-BANK</title>

<script>

console.log("asd")

</script>

<link rel="stylesheet" href="https://maxcdn.bootstrapcdn.com/bootstrap/3.4.1/css/bootstrap.min.css">

<script>

window.watsonAssistantChatOptions = {

integrationID: "aa48965f-f929-410f-a38f-8b24eebcfbcf", // The ID of this integration.

region: "us-south", // The region your integration is hosted in.

serviceInstanceID: "971725a9-5b19-4933-aafa-8d5f021c407a", // The ID of your service instance.

onLoad: function(instance) { instance.render(); }

};

setTimeout(function(){

const t=document.createElement('script');

t.src="https://web-chat.global.assistant.watson.appdomain.cloud/versions/" + (window.watsonAssistantChatOptions.clientVersion || 'latest') + "/WatsonAssistantChatEntry.js";

document.head.appendChild(t);

});

</script>

<style>

body{

background-image: url(/static/ggg.jpg);

background-repeat: no-repeat;

background-attachment: fixed;

background-position: center;

background-size: cover;

}

#hero {

width: 90%;

height: 100vh;

}

/\* background blur black color \*/

#hero:before {

content: "";

background: rgba(0, 0, 0, 0.8);

position: absolute;

bottom: 0;

top: 0;

left: 0;

right: 0;

}

#hero .container {

padding-top: 220px;

text-align: center;

}

#hero h1 {

margin: 0;

font-size: 53px;

font-weight: 600;

line-height: 64px;

color: #03e9f4;

font-family: "Poppins", sans-serif;

}

.btn{

display: inline-block;

border: 2px solid #03e9f4;

background: rgba(0, 0, 0, 0.1);

color: white;

}

/\* content below content \*/

#hero h2 {

color: rgba(0, 0, 0, 0.9);

margin: 10px 0 0 0;

font-size: 24px;

}

</style>

</head>

<body>

<section id="hero" class="d-flex align-items-center justify-content-center">

<div class="container" data-aos="fade-up">

<div class="row justify-content-center" data-aos="fade-up" data-aos-delay="150">

<div class="col-xl-6 col-lg-8">

<h1>AI Based Discourse for Banking Industry</h1>

<h2>Chatbots for banking and finance operations.</h2><br>

<form action="/cards">

<button class="btn btn-outline-light scrollto ">more info</button>

</form>

</div>

</div>

</div>

</section>

</body>

</body>

</html>

**Cards.html:**

<!DOCTYPE html>

<html lang="en">

<head>

<meta charset="UTF-8">

<meta name="viewport" content="width=device-width, initial-scale=1.0">

<!-- <link rel="icon" type="image/png" sizes="32x32" href="./images/favicon-32x32.png"> -->

<script>

window.watsonAssistantChatOptions = {

integrationID: "aa48965f-f929-410f-a38f-8b24eebcfbcf", // The ID of this integration.

region: "us-south", // The region your integration is hosted in.

serviceInstanceID: "971725a9-5b19-4933-aafa-8d5f021c407a", // The ID of your service instance.

onLoad: function(instance) { instance.render(); }

};

setTimeout(function(){

const t=document.createElement('script');

t.src="https://web-chat.global.assistant.watson.appdomain.cloud/versions/" + (window.watsonAssistantChatOptions.clientVersion || 'latest') + "/WatsonAssistantChatEntry.js";

document.head.appendChild(t);

});

</script>

<title>More Info</title>

<style>

:root {

--red: hsl(0, 78%, 62%);

--cyan: hsl(180, 62%, 55%);

--orange: hsl(34, 97%, 64%);

--blue: hsl(212, 86%, 64%);

--varyDarkBlue: hsl(234, 12%, 34%);

--grayishBlue: hsl(229, 6%, 66%);

--veryLightGray: hsl(0, 0%, 98%);

--weight1: 200;

--weight2: 400;

--weight3: 600;

}

body {

font-size: 15px;

font-family: 'Poppins', sans-serif;

background-color: var(--veryLightGray);

}

.box p {

color: var(--grayishBlue);

}

.box {

border-radius: 50px;

box-shadow: 0px 30px 40px -20px var(--grayishBlue);

padding: 30px;

margin: 20px;

}

img {

/\* float: right; \*/

padding-left: 210px;

padding-top: -100px;

}

@media (max-width: 450px) {

.box {

height: 200px;

}

}

@media (max-width: 950px) and (min-width: 450px) {

.box {

text-align: center;

height: 180px;

}

}

/\* line over cards \*/

.cyan {

border-top: 4px solid var(--cyan);

}

.red {

border-top: 4px solid var(--red);

}

.blue {

border-top: 4px solid var(--blue);

}

.orange {

border-top: 4px solid var(--orange);

}

h2 {

/\* color: var(--varyDarkBlue); \*/

font-weight: var(--weight3);

text-align: center;

}

/\* for box diveded \*/

@media (min-width: 950px) {

.row1-container {

display: flex;

justify-content: center;

align-items: center;

}

.row2-container {

display: flex;

justify-content: center;

align-items: center;

}

.box-down {

position: relative;

top: 150px;

}

.box {

width: 20%;

}

.header p {

width: 30%;

}

}

</style>

</head>

<body>

<div class="rpp">

<br>

<br>

<br>

<div class="row1-container">

<div class="box box-down cyan">

<div class="h2" style="text-align: center; font-weight: bolder; font-size: 25px;">

<a href="https://www.onlinesbi.sbi/" target="\_blank">RBI</a>

<br>

</div>

<!-- <p>Monitors activity to identify project roadblocks</p> -->

<img src="/static/download.png" style="width: 90px; padding-left: 110px;" alt="">

</div>

<div class="box red">

<div class="h2" style="text-align: center; font-weight: bolder; font-size: 25px;">

<a href="https://www.ing.com/Home.htm" target="\_blank">ING</a>

</div>

<!-- <p>Scans our talent network to create the optimal team for your project</p> -->

<img src="/static/ING.png" style="width: 190px; padding-left: 70px; padding-top: 16px; padding-bottom: 16px;" alt="">

</div>

<div class="box box-down blue">

<div class="h2" style="text-align: center; font-weight: bolder; font-size: 25px;">

<a href="https://www.onlinesbi.sbi/" target="\_blank">SBI</a>

</div>

<img src="/static/sbi-logo-33205.png" style="width: 130px; height: 60px; padding-top: 17px; padding-bottom: 17px; padding-left: 90px;" alt="">

</div>

</div>

<div class="row2-container">

<div class="box orange">

<div class="h2" style="text-align: center; font-weight: bolder; font-size: 25px;">

<a href="https://www.unionbankofindia.co.in/english/home.aspx" target="\_blank">Union Bank</a>

</div>

<img src="/static/union\_bank-removebg-preview.png" style="width: 150px; height: 100px; padding-left: 80px;" alt="">

</div>

</div>

</div>

</body>

</html>

# GITHUB AND PROJECT DEMO LINK

* + 1. **GUTHUB LINK**

https://github.com/IBM-EPBL/IBM-Project-46343-1660745891

# PROJECT DEMO LINK

https://drive.google.com/drive/folders/1YmDwRTdwJrmx7wi91eeiT7MZjxIeyDfg?usp=sharing

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