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1. INTRODUCTION

1.1. Overview

In this project, we will be building a chatbot using Watson's assistant. This chat should have the following capabilities:

1)The Bot should be able to guide a customer to create a bank account.

2)The Bot should be able to answer loan queries.

3)The Bot should be able to answer general banking queries.

4)The Bot should be able to answer queries regarding net banking.

1.2. Purpose

Chatbots are designed to give people an automated way to communicate with your company. They may answer basic questions, make product recommendations, and provide customer support designed to allow humans and computers to connect in a natural way. Over the last few years, these technologies have become more intelligent, and they have become one of the most potent tools for getting things done in a modern office setting.

2. LITERATURE SURVEY

2.1. Existing problem

Chatbots are intelligent conversational computer systems designed to mimic human conversation to enable automated online guidance and support. The increased benefits of chatbots led to their wide adoption by many industries in order to provide virtual assistance to customers. Chatbots utilize methods and algorithms from two Artificial Intelligence domains: Natural Language Processing and Machine Learning. However, there are many challenges and limitations in their application. In this survey, we review recent advances in chatbots, where Artificial Intelligence and Natural Language processing are used. We highlight current work's main challenges and limitations and make recommendations for future research investigation.

2.2 References

1.IEEE 46 Annual COMPSAC Computers, Software and Application Conference by Jordi chatbot on 2022 with the method of A chatbot system for multidimensional datasets. It desires full-fledged chatbots from API based open data sources maintained the accuracy On the scale of 1 to 5 the precision is 4.37

2.ACM/SIGAPP on Applied computing by Maria Helena Francisation On 2022 with the accuracy Model driven engineering for bot applications. It is a querying multidimensional bigdata through a chatbot systems maintained the 84.27%

3.SSRN Paper By Abhay chopde On 2022 Chatbot using deep learning. The data is learned and processed using a neural of all network layered with multilayers maintained

the accuracy Precision is 0.2 from out profiles.

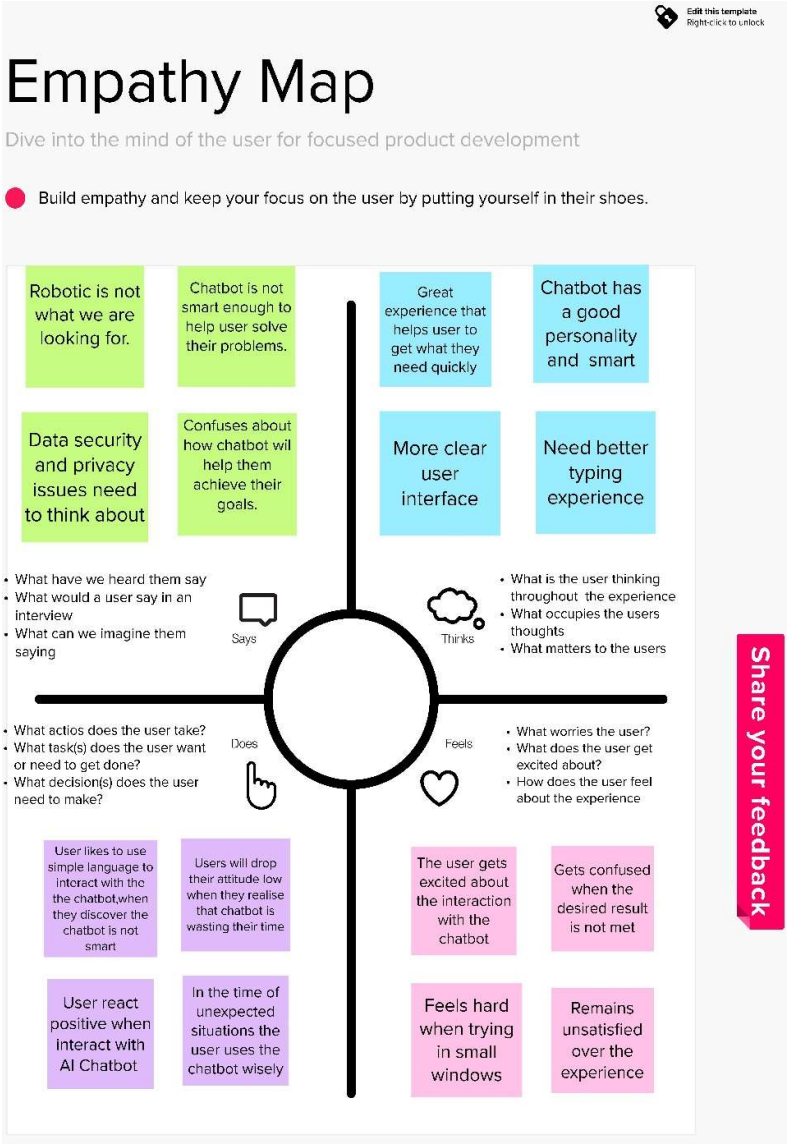
4.NLP for building Educational Applications Association for computational Linguistics by Gladys Tyen on 2022 with the method of Towards an open domain chatbot for language practice and an open domain text system for chit-chat which allow learners to practice chatting in any topic they choose maintained accuracy 93.26%

2.3.Problem statement definition

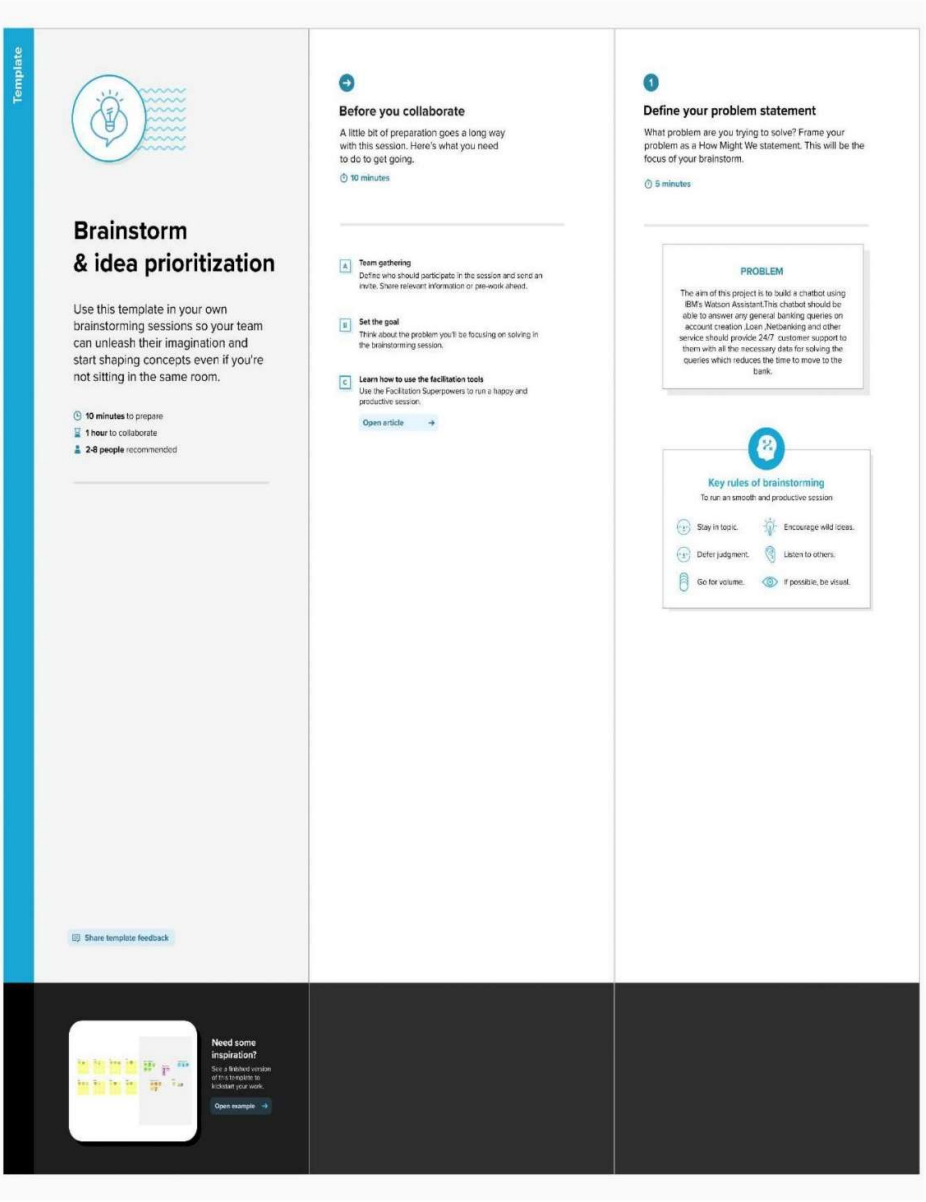
PROBLEM	DESCRIPTION
When does the problem affects?	Illiterate or old people or people who are new to banking environment
What is the issue?	Customers who are not having the awareness of Banking Services.
What are the boundaries of the problem?	Customers of Banking Sectors, Banking Sectors
When does the issues occurs?	In today's busy world people cannot wait for long hours in order to do basic Banking services. Therefore, AI chatbots can help the customers to work quickly and smartly without any fear and worry. Human errors can also be avoided. Even the people can use the banking services easily in comfort for their native languages.

3. IDEATION PROPOSED SOLUTION

3.1 Empathy Map



3.2 Ideation : Brainstorming



2

Brainstorm

Write down any ideas that come to mind that address your problem statement.

⏱ 10 minutes

TIP

You can select a sticky note and hit the pencil [switch to sketch] icon to start drawing!

M Theepiga

- Keep the conversation simple and easily understandable by Customers.
- Decrease the response time to the users
- Make sure the account creation task doesn't glitch
- The process of account creation should be simple

J Shrinee Venisha

- Build pre-requisite questions for queries regarding some type of loan
- The queries should be answered with clear explanation.
- Collect only the required details from the customer.
- Make sure every nook and corner is covered

K Sowmiya

- Make it user friendly by building the chatbot in different languages.
- Make sure the user is able to navigate around with ease.
- Every query should be answered with apt explanation.
- Simplify the process of creating an account

K Soundarya

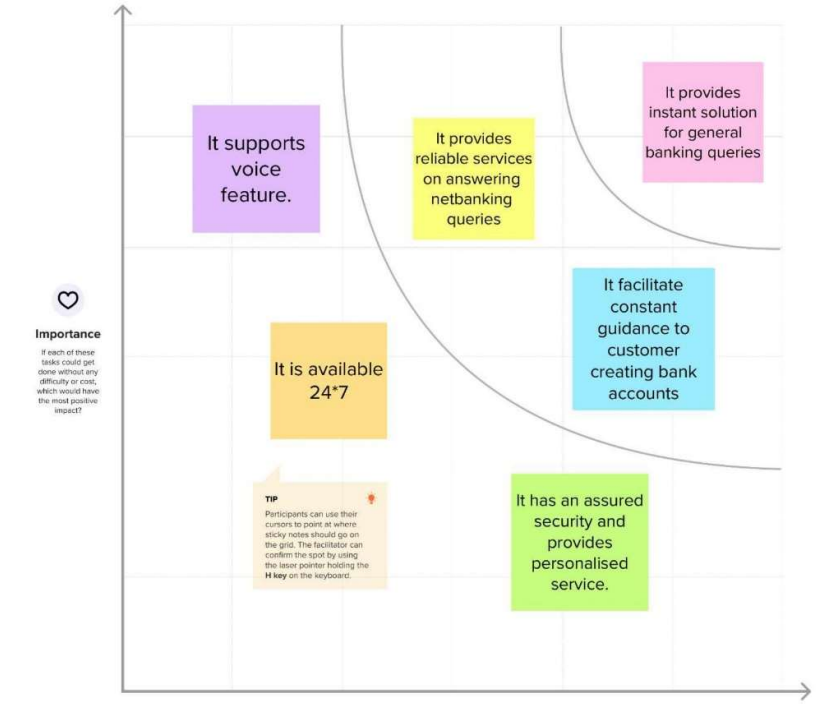
- Every query that the user can think of should be covered.
- The process of creating an account should be simple.
- Make sure the user is able to navigate around with ease.
- Every query that the user can think of should be covered.It is multilingual

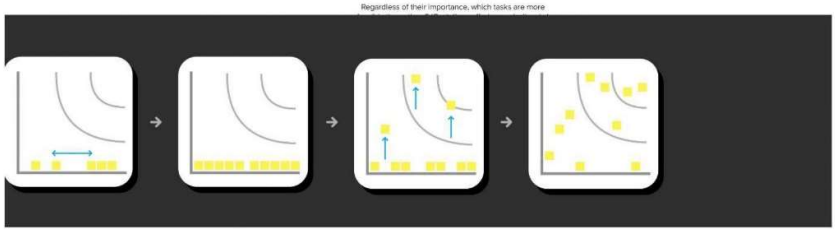
4

Prioritize

Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.

20 minutes

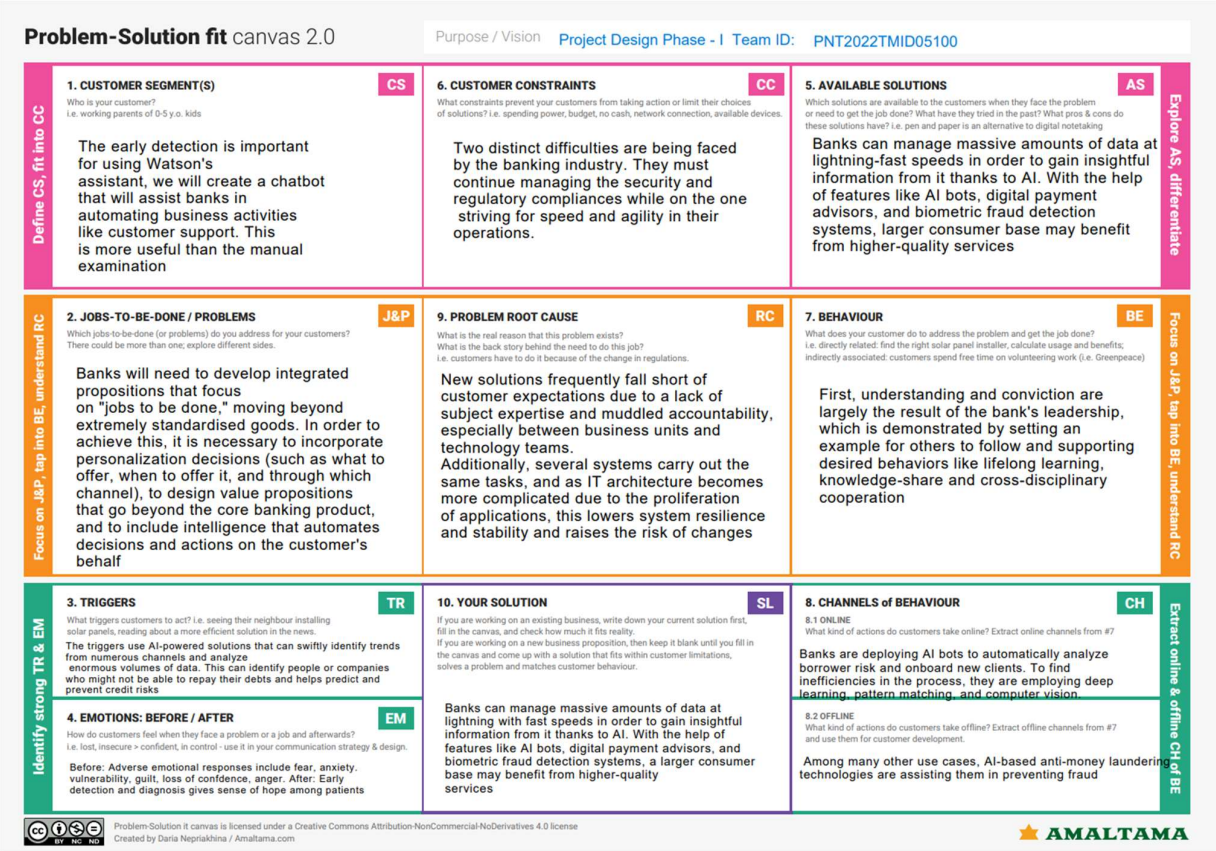




3.3 Proposed Solution

S.no	Parameter	Description
1.	Problem Statement(Problem to be solved)	Banks are not able to resolve the queries of customers at all times related to the products or services in satisfactory way which in turn hinders the customer satisfaction. Customers need to visit banks frequently for simple queries.
2.	Idea / Solution Description	In order to guide the customers throughout all the financial services provided by the bank, an intelligent system has to be introduced to provide people with the best solution possible.
3.	Novelty / Uniqueness	Chatbots developed using AI should be able to answer any general banking queries on account creation, loan, net banking, other services etc. It should address the queries of the customer immediately and in an efficient manner.
4.	Social Impact / Customer Satisfaction	In order to attain the user satisfaction issues associated with banking services, chatbot will provide personal and efficient communication between the user and the bank. It is built to be the overall virtual assistant that can facilitate customers to ask banking-related questions without visiting the bank or calling up customer service centres as well as providing them with relevant suggestions.
5.	Business Model	Employing a chatbot will be a cost-effective solution to clear customer queries for banks. It eliminates the need for a massive customer care workforce and even reduces the workload of the bank employees whose efforts can be used elsewhere.
6.	Revenue Model	AI Chatbots provides 24/7 service to clear all customer queries and guide them through all the banking processes. It supports voice assistance feature and maintains a confidential conversation with customers. 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

3.4 Problem Solution fit



4. REQUIREMENT ANALYSIS

4.1 Functional requirement

Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail Registration through LinkedIN
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	Greeting	The MIS Assistant needs the capability to accurately tell time so as it greets users appropriately.
FR-4	Help support	1.It should also have predefined questions and keywords with their expected answers. 2.The MIS Assistant needs the ability to quickly and accurately look up the question from its templates.
FR-5	Set Remainder	The MIS Assistant needs the ability to save and display reminders as requested by the users of the system.
FR-6	Announcement	This chatbot needs the capability of broadcasting a message to all users.
FR-7	Events	This chatbot needs the capability of retrieving and displaying events for a system

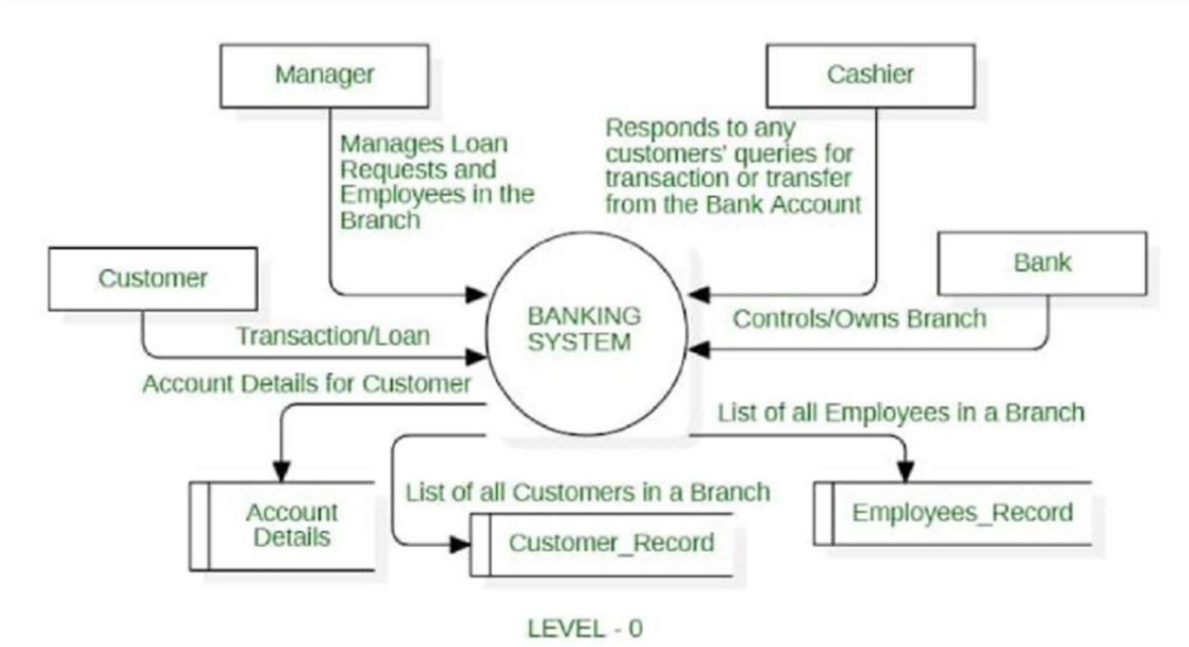
4.2 Non-Functional requirements

Web application is a software or application that can be accessed through the internet using multiple web browsers, Sometimes people think website and web applications are same but actually not in website client can only read the context of the page he has no ability to change the data of the page but in web application user can read and change the data as well Chatbot is a system in web application that is a computer program which is enabled with artificial intelligence technology to do conversation via voice or text methods. The artificially intelligent system is designed in such a way that it will answer the query in a way like a human does. The Al gives the chatbox system to reach the next stage. The advances of Artificial Intelligence improved to the place where chatbots can not only perform the dialogue with people but also they can perform the task which are necessary for us.

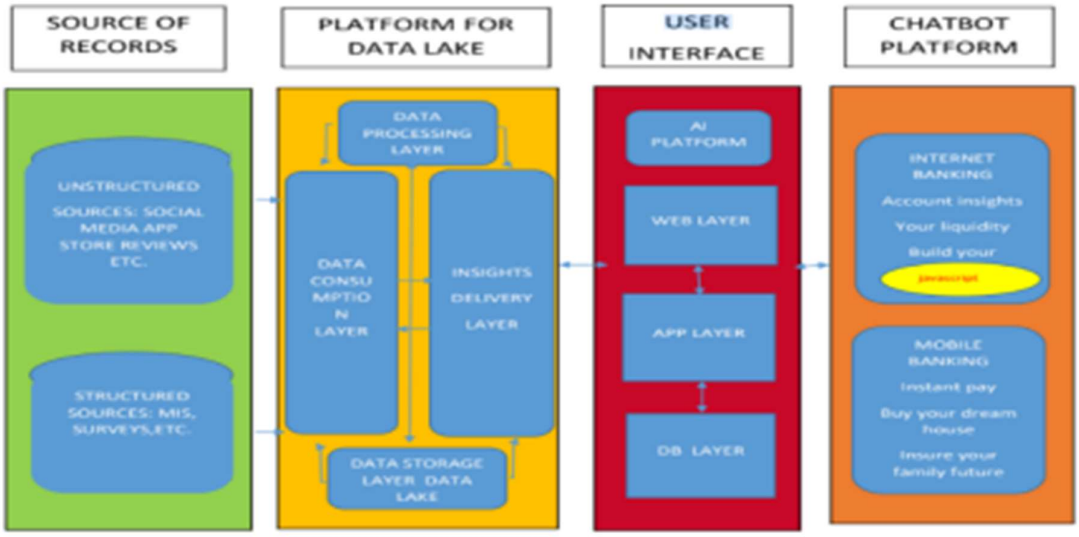
In the field of software engineering requirements are needed at first. Similarly to build a web application some requirements are needed which are catagorized into two parts, functional requirements and non functional requirements Non-functional requirements deal with any software that how should this software work. In this paper we discuss about the non-functional requirements of web application based on chatbot. We will discuss various non-functional requirements such as:Accuracy permance security based on chatbot. To build a software or to build a web application it is necessary to focus on the requirements. Otherwise the web application can't give the client satisfiction. For that the software or the web application can't improve itself So it is the must discussed topic to focus on the requirements.

5. PROJECT DESIGN

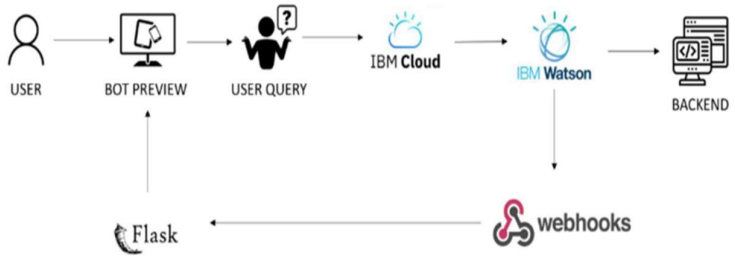
5.1 Data Flow Diagrams



5.2 Solution : Technical Architecture



SOLUTION ARCHITECTURE



5.3 User Stories

User stories are a vital tool in the design and testing of chatbots. They are stories about fictional users, what they want, and how they will interact with your bot. When we create a user story, it needs to be as close to a real user as possible. They should be based on a real user or the type of user that would be using your chatbot. If you have existing customers that you are wanting to target your chatbot toward then you can create data-driven user stories.

6. PROJECT PLANNING : SCHEDULING

6.1 Sprint Planning : Estimation

Sprint is a part of the Scrum framework. In Scrum, large projects are broken down into a series of iterations of smaller manageable bits that teams can handle. These iterations are called sprints. A Sprint is a time-boxed period during which a Scrum team must complete an amount of work. Sprints are pivotal to the Scrum framework, and companies can help teams produce high quality software faster and more frequently if they get them right. Furthermore, when teams work in Sprints, they enjoy more flexibility and become more adaptable. Manage project status, plan sprints, and create insightful reports to drive data-driven decisions in Gmail with the Gmail extension**.**

6.2 Sprint Delivery Schedule

Sprint planning is an event in scrum that kicks off the sprint. The purpose of sprint planning is to define what can be delivered in the sprint and how that work will be achieved. Sprint planning is done in collaboration with the whole scrum team. However, before you can leap into action you have to set up the sprint. You need to decide on how long the time box is going to be, the sprint goal, and where you're going to start. The sprint planning session kicks off the sprint by setting the agenda and focus.

6.3 Reports from JIRA

Sprint burndown

BETA

20 points done, 0 points to go

On track

Sprint burndown

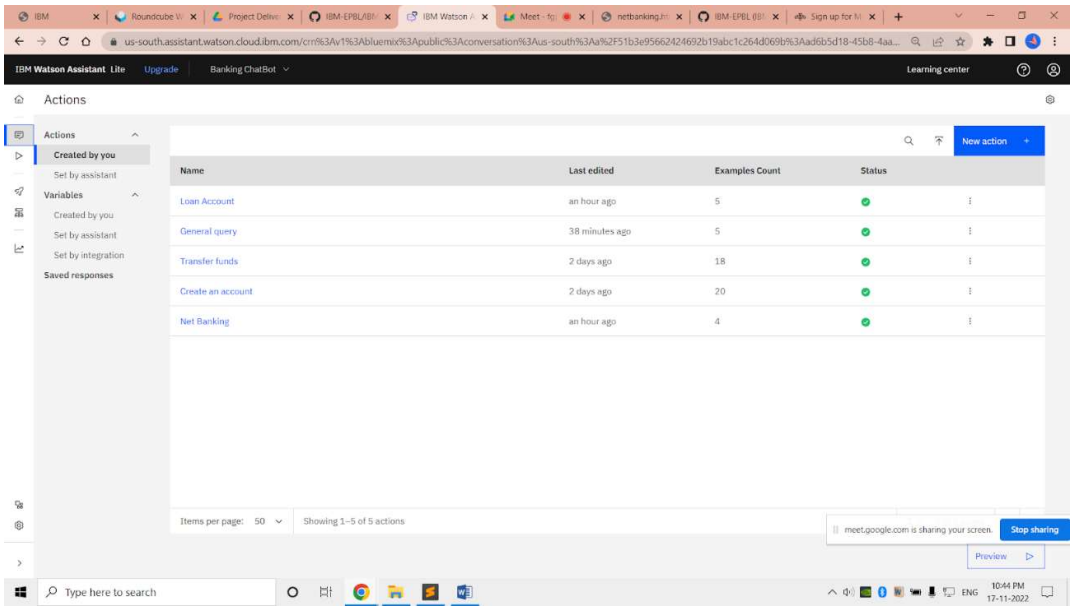
BETA

20 points done, 0 points to go

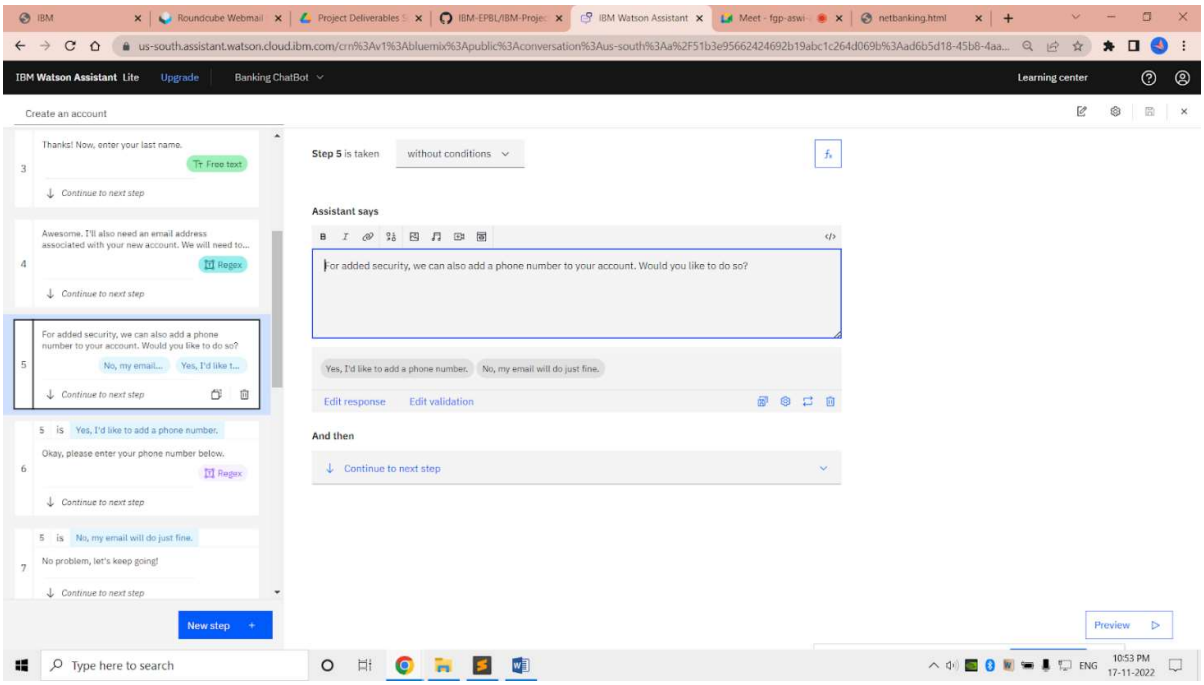
On track

7. CODING & SOLUTIONING

7.1 Feature 1



7.2 Feature 2



8. TESTING

8.1 Test Cases

	Test Scenarios
1	Verify user is able to see the chatbot icon when website is launched
2	Verify the UI elements in chatbot icon popup
3	Verify user is able to see the greeting from chatbot "Hi! I'm a Banking Bot. How can I help you today? Banking Enquiry Loan"
4	Verify user is able to type query in text field.
5	Verify user is able to get the response from chatbot
6	Verify user whether get the response if the user enter the wrong query also

	Search
1	ChatBot icon should display.
2	After 30 seconds Information about chatbot popup displayed
3	User should see the greeting message from chatbot
4	User able to type the query in text field.
5	Users get the response from chatbot.
6	Kindly reach out to our customer care executive. Contact Us @9999xxx999

8.2 User Acceptance Testing

UAT Execution & Report Submission

a) Purpose of Document

The purpose of this document is to briefly explain the test coverage and open issues of the AI-based discourse for Banking Industry project at the time of the release to User Acceptance Testing (UAT).

b) Defect Analysis

Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Subtotal
By Design	1	0	0	0	1
Duplicate	3	1	0	1	5
External	1	3	0	1	5
Fixed	2	5	3	2	12
Not Reproduced	0	0	0	1	1
Skipped	0	0	0	0	0
Won't Fix	0	0	0	0	0
Totals	7	9	3	5	24

C) Test Case Analysis

This report shows the number of test cases that have passed, failed, anduntested.

Section	Total Cases	Not Tested	Fail	Pass
Print Engine	1	0	0	1
Client Application	1	0	0	1
Security	1	0	0	1
Outsource Shipping	0	0	0	0
Exception Reporting	1	0	0	1
Final Report Output	1	0	0	1
Version Control	1	0	0	1

8.3 PERFORMANCE TESTING

Test Report

Test Cycle System Test

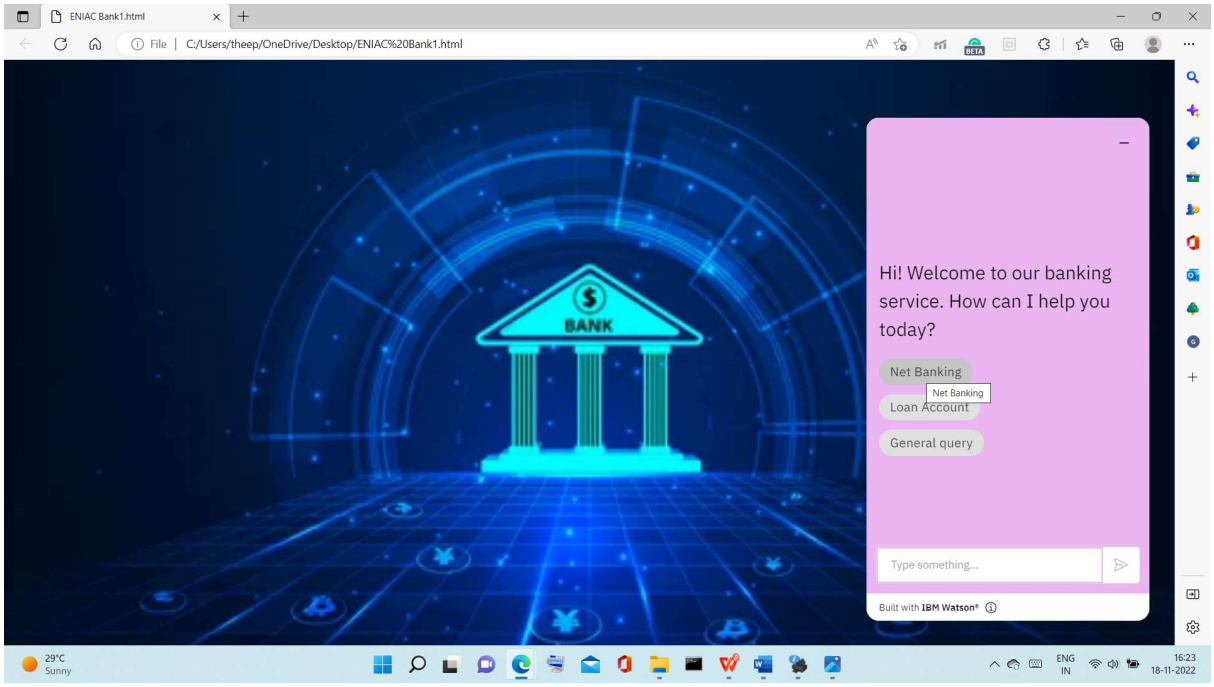
EXECUTED	PASSED			130	
	FAILED			0	
	(Total) TESTS EXECUTED (PASSED + FAILED)				130
PENDING					0
IN PROGRESS					0
BLOCKED					0
(Sub-Total) TEST PLANNED (PENDING + IN PROGRESS + BLOCKED + TEST EXECUTED)					130

Functions	Description	% TCs Executed	% TCs Passed	TCs pending	Priority	Remarks
New Customer	Check new Customer is created	100%	100%	0	*High*	
Edit Customer	Check Customer can be edited	100%	100%	0	*High*	
New Account	Check New account is added	100%	100%	0	*High*	
Edit Account	Check Account is edit	100%	100%	0	*High*	
Delete Account	Verify Account is delete	100%	100%	0	*High*	
Delete customer	Verify Customer is Deleted	100%	100%	0	*High*	
Mini Statement	Verify Ministatement is generated	100%	100%	0	*High*	
Customized Statement	Check Customized Statement is generated	100%	100%	0	*High*	

9.

RESULTS:

9.1 Performance Metrics



10. ADVANTAGES And DISADVANTAGES

ADVANTAGES

1. Chatbots have 24/7 Availability: Chatbots can be available to solve customer problems 24/7 whether it is day or night! They don't need to sleep after all! This is much more difficult to achieve using human customer service as it would require rotating teams that would be more complicated to manage as well.

2. Chatbots can gather Customer Insights: Companies thrive on customer data! The more data they have, the better they can cater to their customers and be much more successful. That's where chatbots can be a big help. Whenever you interact with any chatbots on a company page, you provide basic data such as user preferences, buying habits, sentiments, etc. which can then be analysed to understand market trends, operational risks, etc. And using this information, the company can solver customer issues much easier and create targeted products. This will help in increasing their customer loyalty!

DISADVANTAGES

1. Chatbots sound too Mechanical: Chatbots are not human and so obviously they cannot interact as a human with customers. They sound too mechanical and can only give answers to problems that they have been programmed with. They cannot answer a customer according to the context and they cannot show any emotions if needed. Chatbots also cannot maintain a natural-sounding conversation in-depth with customers and that is why they are only useful in solving basic queries. But this can create a disconnect with customers who prefer the human approach when solving their problems.

2. Chatbots can only handle basic Questions: Chatbot are still a basic Artificial Intelligence technology and so they can only answer the basic questions of customers and provide general information that is already available to them. They cannot solve complicated queries or answer out of script questions and companies need to have human customer service employees that can manage these for them. However, this is changing with time and currently, more and more advanced chatbots are entering the market.

11. CONCLUSION

In this paper we have provided a survey of relevant works of literature on the subject, and we have analysed the state of the art in terms of language models, applications, datasets used, and evaluation frameworks. We have also underlined current challenges and limitations, as well as gaps in the literature. Despite technological advancements, AI chatbots are still unable to simulate human speech. This is due to a faulty approach to dialogue modeling and a lack of domain-specific data with open access. For Information Retrieval chatbots, there is also a lack of a learnt AI model. There is still a gap to be closed in terms of applications between Industry models and current advancements in the sector. Large models necessitate a lot of computing power and a lot of training data. There is no universal framework for evaluating chatbots. Several models depend on human evaluation, yet human evaluation is expensive, time-consuming, difficult to scale, biased, and lacks coherence. A new, reliable automatic evaluation approach should be provided to overcome these restrictions.

12. FUTURE SCOPE

Chatbots are Now Based on Natural Language Processing(NLP)

The goal is to allow users and Artificial Intelligence to communicate naturally and understand complex requests. This would mean that customer service agents would be able to focus on other tasks while the AI takes care of customers' queries. Chatbots in finance, in the digital banking and healthcare industries might save more than 12 billion USD in a year by 2022. According to several estimates, financial organizations might save 2 trillion USD by 2030 by implementing artificial intelligence and cutting costs by 35%.In the digital banking business, banks with Chatbots can automate a variety of functions in addition to enhancing everyday operations and the universal consumer experience as fund transfer, Notifications & Alerts at the Right Time, Get help from a Customer Service Representative, simple lead generation.