4. REQUIREMENT ANALYSIS

4.1 Functional Requirements

Functional requirements are the desired operations of a program, or system as defined in software development and systems engineering. The systems in systems engineering can be either software electronic hardware or combination software-driven electronics.

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 Gmail
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	Complex dialogues	Savings Account, Current Account, Loan Account, Net Banking and General Banking related Quires. understanding and interacting within conversations, outstanding chatbot software has NLP functions.
FR-4	Savings Account Related Quires	Type of Savings Account Creation Details, Interest Rate, Minimum Balance, Debit Card /Credit Card
FR-5	Current Account Related Quires	Type of Company, Current Account Closure Steps, Update GSTIN, Zero Balance Current Account
FR-6	Responses	The bot should be answering the user Quires.
FR-7	User data storage /Send users data.	The bot should be able to create a private cloud or virtual machine instances from user input. The data can be sent as a text message The data can be sent as a text, if requested by the user.

4.2 Non-functional Requirements

Nonfunctional Requirements (NFRs) define system attributes such as security, reliability, performance, maintainability, scalability, and usability. They serve as constraints or restrictions on the design of the system across the different backlogs.

Following are the non-functional requirements of the proposed solution.

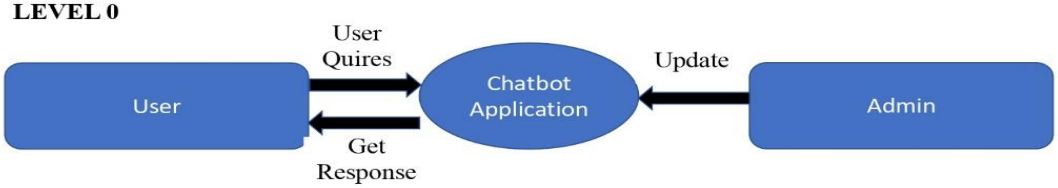
FR No.	Non-Functional Requirement	Description
NFR-1	Usability	It can act as an answering machine and serve the customers continuously throughout a day. It can answer the simple questions of the users of customized banking app and redirect them to the bank's website if necessary.
NFR-2	Security	Bank management systems are notorious for being subject to malicious attacks, so security is the major requirement for the system. Unauthorized access to the data is not permissible. The data must be backed up daily and stored in a secured location, at a distance from different facilities of the system.
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. Thus, AI Chatbots has a reliable end-user experience
NFR-4	Performance	Direct and basic operations including opening or closing the account, transfer of funds, etc. can be done with the help of chat bots.
NFR-5	Availability	The system must be available during bank working hours and respond to queries from late-night visitors or just those in other time zones. The mobile banking and money transactions available in 24/7.
NFR-6	Scalability	AI Chatbots are 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

5. PROJECT DESIGN

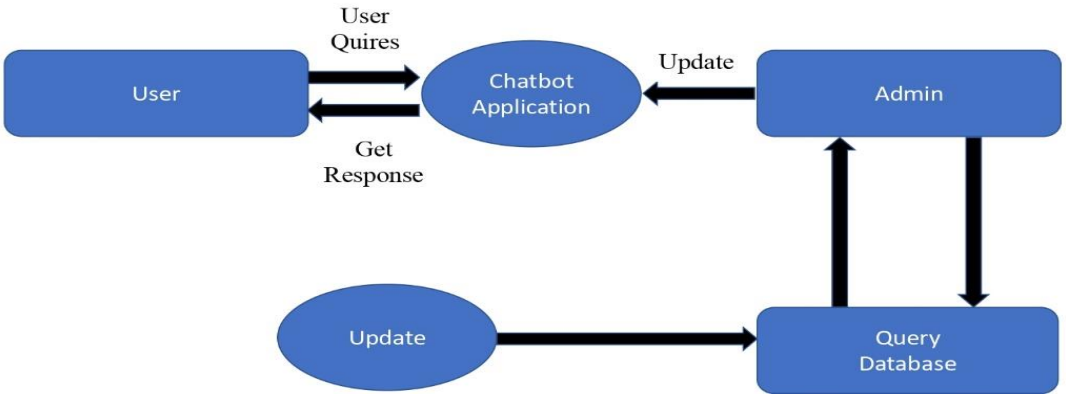
5.1 Data Flow Diagrams

A data flow diagram shows the way information flows through a process or system. It includes data inputs and outputs, data stores, and the various subprocesses the data moves through. DFDs are built using standardized symbols and notation to describe various entities and their relationships.

LEVEL 0



LEVEL 1



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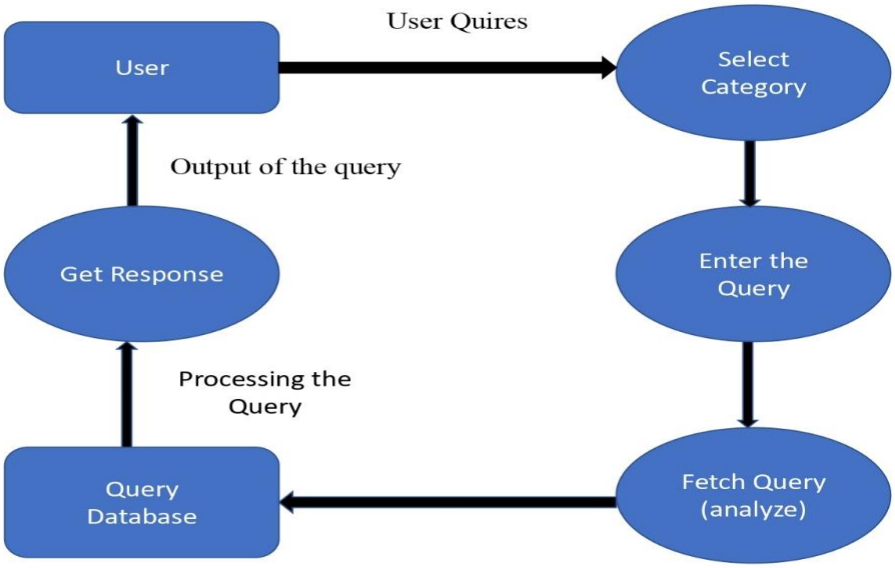

5.2 Solution & Technical Architecture

A solution architecture (SA) is an architectural description of a specific solution. SAs combine guidance from different enterprise architecture viewpoints (business, information and technical), as well as from the enterprise solution architecture (ESA).

An architectural diagram is a visual representation that maps out the physical implementation for components of a software system. It shows the general structure of the software system and the associations, limitations, and boundaries between each element. Software environments are complex—and they aren't static.

The Deliverable shall include the architectural diagram as below and the information as per the table1 & table 2

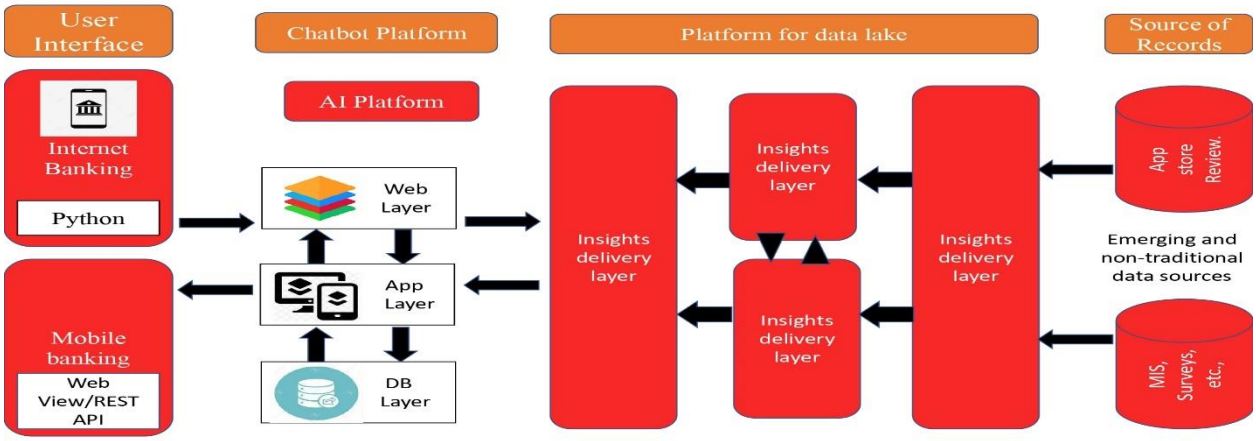

Table-1: Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	How user interacts with application e.g. Web UI, Mobile App, Chatbot etc.	HTML, CSS, JavaScript
2.	Application Logic-1	Logic for a process in the application	Python
3.	Application Logic-2	Logic for a process in the application	IBM Watson STT service
4.	Application Logic-3	Logic for a process in the application	IBM Watson Assistant
5.	Database	Data Type, Configurations etc.	MySQL, NoSQL, etc.
6.	Cloud Database	Database Service on Cloud	IBM DB2, IBM Cloudant etc.

7.	File Storage	File storage requirements	IBM Block Storage or Other Storage Service or Local Filesystem
8.	External API-1	Purpose of External API used in the application	IBM Weather API, etc.
9.	External API-2	Purpose of External API used in the application	Aadhar API, etc.
10.	Machine Learning Model	Purpose of Machine Learning Model	Object Recognition Model, etc.
11.	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud Local Server Configuration Cloud Server Configuration	Local, Cloud Foundry, Kubernetes, etc.

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	List the open-source frameworks used	• Microsoft Bot Framework • Botkit • OpenDialog
2.	Security Implementations	List all the security / access controls implemented, use of firewalls etc.	Authentication processes • Biometric authentication • Two factor authentications • User-id • Authentication timeout
3.	Scalable Architecture	Justify the scalability of architecture (3 – tier, Micro-services)	Response time, Throughput, CPU and network usages, etc
4.	Availability	Justify the availability of application (e.g. use of load balancers, distributed servers etc.)	All kind of users access at the any time.
5.	Performance	Design consideration for the performance of the application (number of requests per sec, use of Cache, use of CDN's) etc.	Watson Assistant is used to build the chatbot. It is access at 24/7 understanding the user quires and response the user.

5.3 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 that savings account.	I can clear my queries regarding types of savings account	High	Sprint-1
		USN-2	As a user, I can check the Interest Rates ofSavings 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 Companyto 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 procedureto close my Current Account	I can clear my queries regarding current accountclosure	High	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	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
User Type	**Functional Requirement (Epic)**	**User Story Number**	**User Story / Task**	**Acceptance criteria**	**Priority**	**Release**

		USN-8	As a user, I can check the Status of Loan for my Loan Accounts	I can clear my queries regarding loan status ofloan account	Low	Sprint-2
	General Queries Related Actions	USN-9	As a user, I want to get the procedure detailsfor Currency Conversion 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 whether myloan 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 Storage Locker facility of mybank account	I can clear my queries regarding storage locker facilities of bank account	High	Sprint-3
	Net Banking Related Actions	USN-12	As a user, I want to get the procedure details for changing the Net Banking password of mybank account	I can clear my queries regarding change of net banking password	Medium	Sprint-2
		USN-13	As a user, I can select types of fund transfers to get details regarding different services available in net banking	I can clear my queries regarding types of fund transfers in net banking	High	Sprint-3
		USN-14	As a user, I want to get the procedure details for adding beneficiaries to my net banking account.	I can clear my queries regarding adding beneficiaries in net banking	Low	Sprint-3

Administrator		USN-15	As an admin, I can change responses to queries and modify them as and when needed.	I can modify responses of the chatbot	Medium	Sprint-1
		USN-16	As an admin, I can added more options to queries and add new options as new features get added.	I can add more options and queries into the chatbot	Medium	Sprint-1

10.ADVANTAGES & DISADVANTAGE

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

Applications

Banking chatbots have all the data to predict the spending habits of customers and help them keep their finances on track.

11.CONCLUSION

- It is difficult to get the information on a single interface without complications of going to multiple windows and multiple banks.
- The banking inquiry chat bot aims to remove this difficulty by providing a common end user-friendly interface to solve queries of customers as well as bank employee.
- The purpose of a chat bot system is to simulate a human conversation.
- Using artificial algorithms and natural language processing it is made possible to make online communication between human and a computer.
- Customers and employees can freely upload their queries.
- The system will take text as well as voice as an input.
- The chat bot provides answers very quickly. The System will have effective GUI so that users can easily understand the system