SETHU INSTITUTE OF TECHNOLOGY

Department of

COMPUTER SCIENCE AND BUSINESS SYSTEMS

19UCB801 – FINAL YEAR PROJECT

E – BOT

An Advanced Chatbot built using NLP and Keras Neural Networking

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Abstract

E – Bot is web based chatbot application that aims to simplify the user access to Tamilnadu E-Service websites by seamlessly guiding them through various processes. E – Bot uses Natural language processing (NLP) and Keras neural network algorithms to comprehend and respond human like answers. The proposed system not only allows users to fetch details and make payments but also adapts to their prompt and recording valuable data for the future training.

Literature Review – 1

Journal Name	Journal of System and Management Science Vol:13 ***[2023]***
Title	Improving Chatbot Performance using Hybrid Deep Learning Approach.
Authors	Palanisami Naveen[1], Sue-Cheng Haw[2], Devakumar Nadathan[3]
Methodology Used	Data gathering and data Pre-Processing is the initial step of the this theoretical model. The next crucial step is building hybrid model which generates real time text using pre defined model and the output is refined using encoder.
Limitations	Restricted Capabilities and Loss of Generic Inputs.

Source - https://www.aasmr.org/jsms/Vol13/No.3/Vol.13.3.34.pdf

Literature Review – 2

Journal Name	Science Direct vol:11, Edition: 100198 ***[2023]***
Title	A comparative study of retrieval – based and generative – based chat bot using Deep Learning and Machine Learning.
Authors	Sumit Pandey[1], Srishti Sharma[2]
Methodology Used	Data gathering and data Pre-Processing using quasi-statistical method to analyse the importance of school based mental health service (SBMHSs). It is a multi-tiered approach which trains the processed data to generate an accurate response.
Limitations	Limited responses, Once started, the training model cannot be modified.

Source - https://www.sciencedirect.com/science/article/pii/S2772442523000655

Literature Review – 3

Journal Name	Journal of Management and Services Science Vol.: 02, Article: 15 ***[2022]***
Title	Artificial Intelligence based Chat bot: A Case Study.
Authors	Nidhi Singh Kushwaha[1], Pawan Singh[2]
Methodology Used	It is a Rule-based chat bot guided with pre defined questions and it's respective answers. It uses NLP engine to communicate with user which has internet classifier and entity extractor.
Limitations	It does not shift from thing it already knows.

Source - https://jmss.a2zjournals.com/index.php/mss/article/view/15/15

Literature Review – 4

Journal Name	IEEE – Springer Vol.: 11-18 Article: ICTCS 15 ***[2022]***
Title	AI-Based Interactive Agent for Health Care Using NLP and Deep Learning.
Authors	Hemavathi U[1], Ann C. V. Medona[2]
Methodology Used	AI based interactive agent using Natural language processing and Deep learning which deals with simple queries and provide health cares services. It uses NLP and neural network to process data.
Limitations	Requires intense training of pre-processed data.

Source - https://link.springer.com/chapter/10.1007/978-981-19-0095-2_2

Literature Review – 5

Journal Name	IEEE – Springer Vol.: 398 2nd Edition ***[2021]***
Title	Music Genre Classification Chat Bot.
Authors	Rishit Jain[1], Ritik Sharma[2], Preeti Nagrath[3] and Rachan Jain[4]
Methodology Used	It is a music information retrieval (MIR) the uses traction of Convolutional neural networking (CNN) to differentiate between audio files by assessing the visual representation of the timbral features.
Limitations	Cannot be trained with pre-processed data. Training for each and individual user is important.

Source - https://link.springer.com/chapter/10.1007/978-981-16-0733-2_27

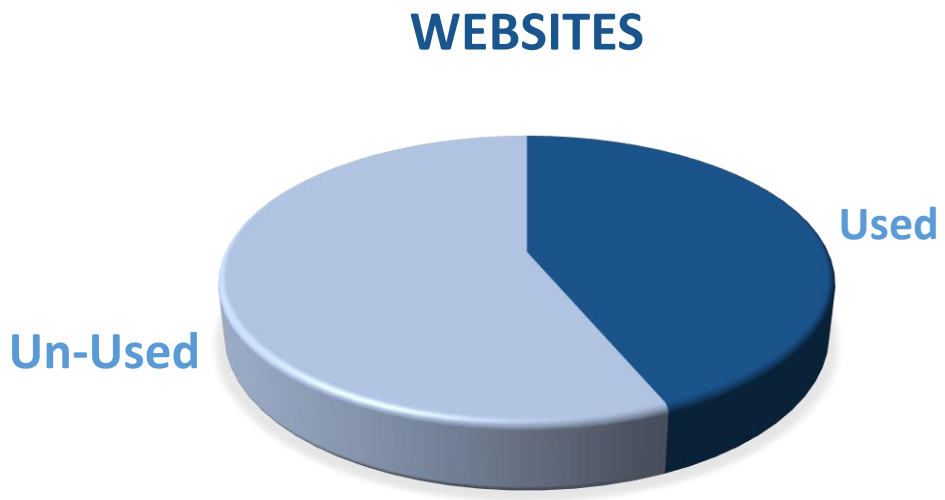
Problem Statement

- There are 6,868 plus websites provided by our government.
- But, only less than half of the websites are being used.
- One of the main reason for that it is hard to navigate and identify the genuine webpage.

Total websites : 6,868 (approx.)

Used websites : 2,998

Unused websites : 3,870+



Existing System

Existing chat bot available in the market are,

- **Response Chatbot**

  A response chatbot generates human-like replies based on predefined patterns and learned information to engage in conversation with users.

- **Rule-based Chatbot**

  A response chatbot generates human-like replies based on predefined patterns and learned information to engage in conversation with users.

Drawbacks in Existing System

- There is no prior feature to navigate users through E-Service website.
- Manual navigation using human knowledge.
- Absence of feedback system to know about users experience.
- Unavailability of live training and pre-processing model web based chat bot.

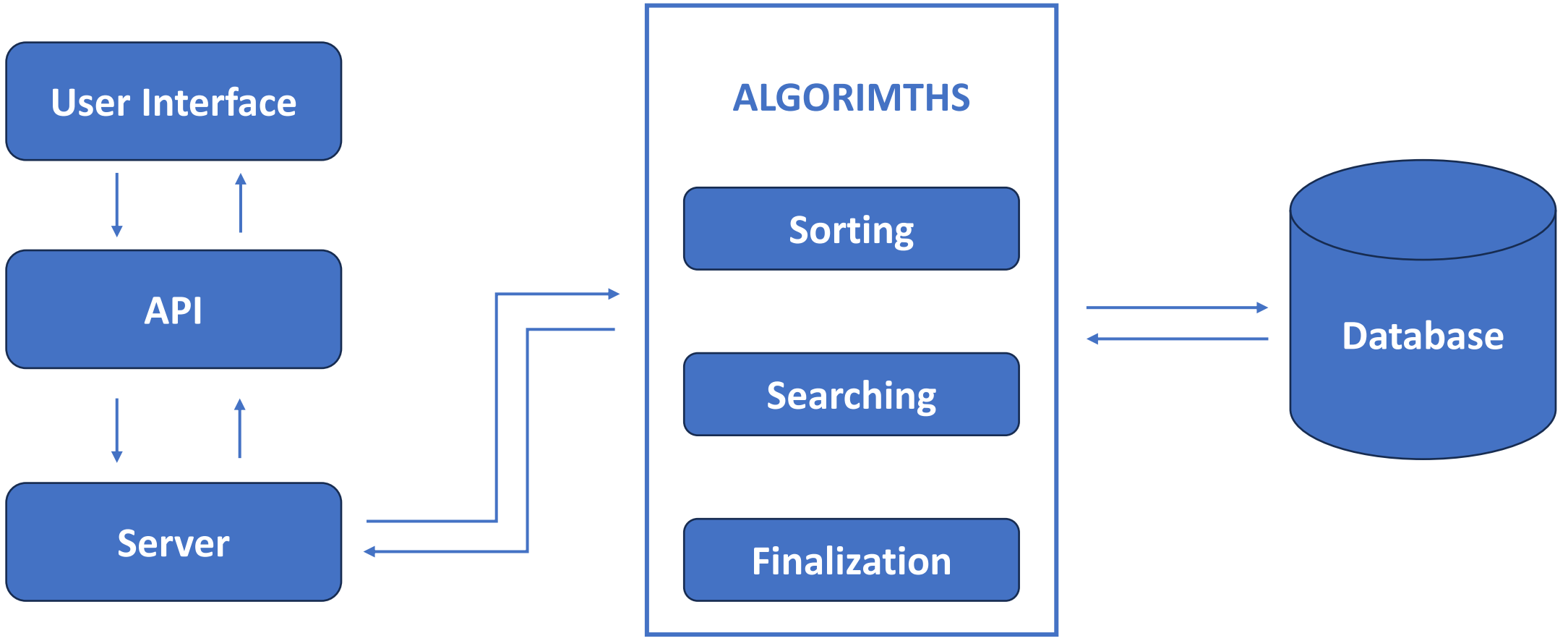
Proposed System

- Proposed solution is a conventional chatbot.
- This helps users to answer their queries and navigate through the E-Service government website.
- Users will be directed straight to the webpage they seek.
- This chatbot has features like,
  - ❑ Common Queries
  - ❑ Bill Payment
  - ❑ Document Download
  - ❑ Toll – Free Numbers

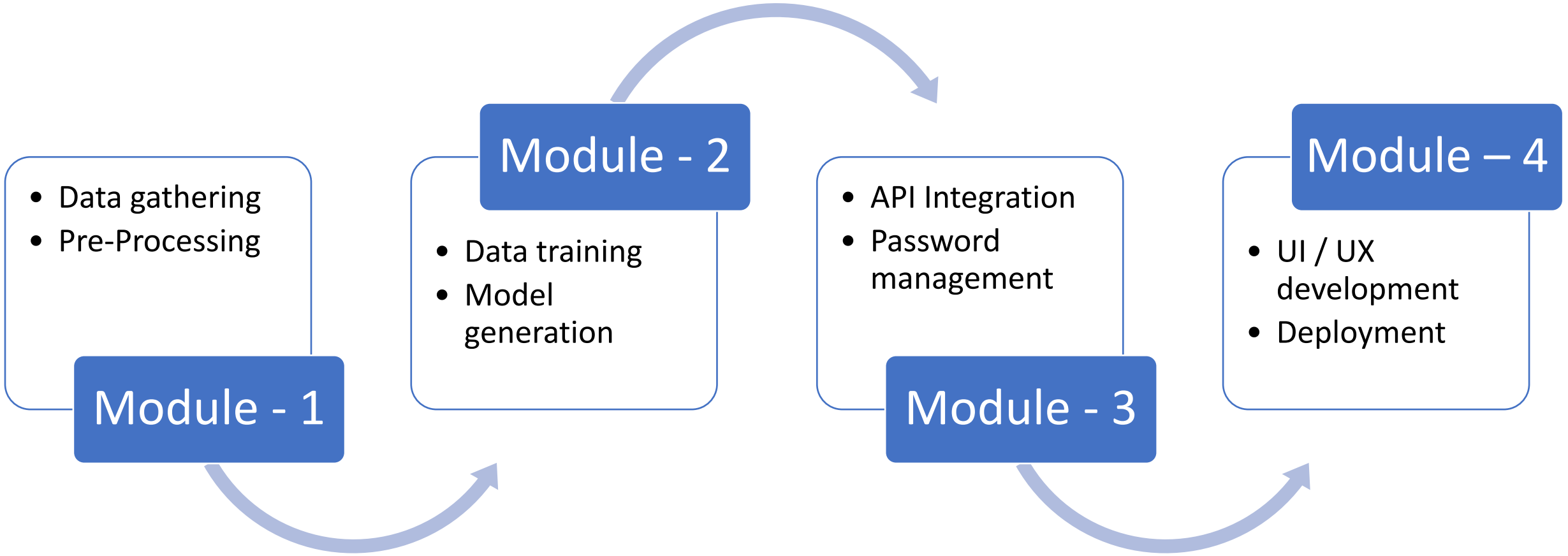
Advantages of Proposed System

- Secured chat history storage that does not involve personal information.
- Allows user to pay bills using local storage and secure payment gateway.
- Uses real time data of user to produce adaptive responsive answers according to the users.
- Stored chat history of user can be used in future to train the model.

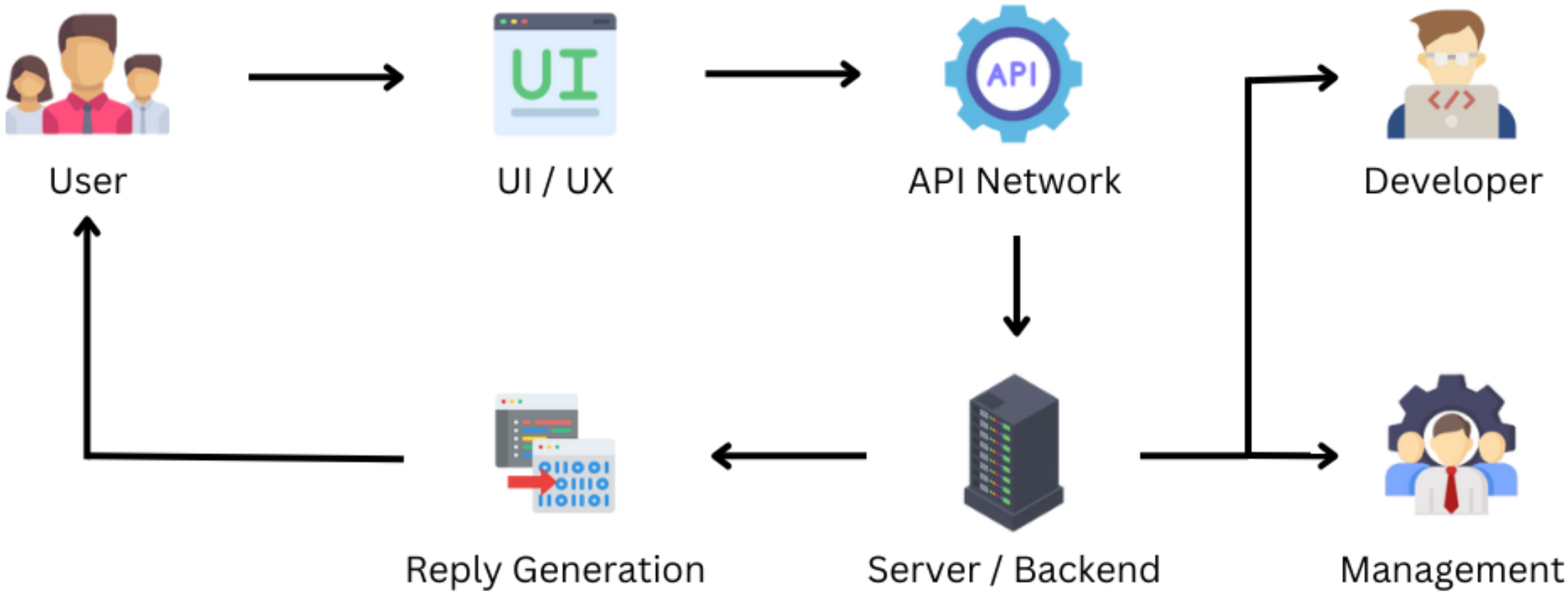
Block Diagram



Module Design



Data Flow Diagram

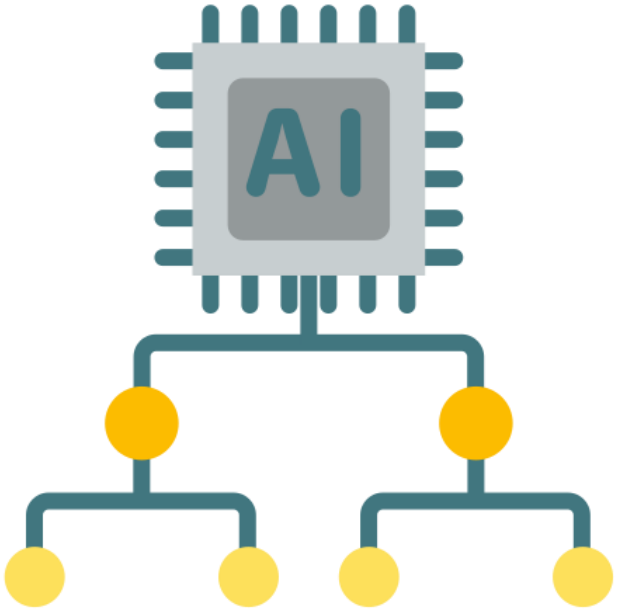


Module 1 – Data Gathering

- Collecting website details.
- Categorizing the websites.
- Users need and Requirements.
- Website usage statistics according to time and region.

Module 2 – Training Data

- Pre-processing the gathered data.
- Organizing the pre-processed data.
- Using Algorithms to train the data.
- Creation of training model using processed data.
- Processing data using NLP and Keras algorithms.



Module 3 – API Integration

- Integration of third party API’s
  - **IP- Geo Location** : To track users location.
  - **Password Safe** : To store users personal data in their local storage.
  - **Razor pay Gateway** : Payment gateway to pay bills.

Module 4 – UI / UX Development

- Development of user interface.
- Integration of front-end and back-end.
- Application testing with various scenarios.
- Deployment of the application

Algorithms and Methodology

- **Natural Language Processing :** Can understand and reply human like answers.
- **Tensor Flow :** Used along with NLP to train the pre-processed dataset and create a base model to work with.
- **KERAS :** Keras is neural networking algorithm which defines relationship between multiple question.
- **NumPy :** Mathematical algorithm used to ID the datasets.