

A PRELIMINARY PROJECT REPORT ON

A NEWS WEB APPLICATION PROJECT USING
ARTIFICIAL INTELLIGENCE BASED VIRTUAL VOICE
ASSISTANCE

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Certificate

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Abstract

In modern technology speech recognition, object identification, digital image processing, language processing plays a key role in security and other factors, a frequent problem within the user interaction of the system or the cost that is too expensive, people suffering from visual impairment still struggles on their day-to-day activities. Speech recognition is the most common mechanisms in artificial intelligence in association with machine and deep learning is that the mechanisms for identifying the natural language of a personalities.

To solve the problem, we will introduce our website as a digital assistant, aims to help the visually impaired in recognizing text on real-world objects and provide audio feedback in real-time.

With the help of speech recognition, Artificial Intelligence and we can create a website where vision blind person can enjoy the newspaper information without any reluctance. AI allows users to understand the query and initiates a run-through of their data sets (memory) to address accurately. This project will be trying to make information reading extra fun and interactive with the use of the voice assistant. The website will be completely interactive and the user can get news from any subject matter of interest simply with the aid of talking. The user can get the information by way of category, genre and through popular information channels. The website will completely responsive and will works nicely with any tool consisting of a laptop, desktop, or mobile cellphone. It can work on various operating systems like Android, MacOS, Windows. The assignment will develop with the use of technology which include ReactJS, JavaScript, visual Studio Code, Alan API etc.

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1 Introduction

Traditional news gathering methods such as newspapers, radios, televisions have been and succeeded for a long time. In modern-day, we are familiar with the use of smartphones and other types of computers for the same through the use of the internet. Although these methods work well, news gathering has never been fun and much interactive.

With rapid advancements in computing technology, we have achieved steps closer to developing Artificial Intelligence (AI). AI sometimes also called Machine Intelligence is a revolutionary branch of computer science, capable of performing tasks that were thought to be impossible for a machine. The term “Artificial Intelligence” was coined at the Dartmouth college in 1956 and has seen a huge demand as it seems to be the future of computing.

1.1 Motivation

Motive of this project is to create ease for the people who are challenged with vision. So, they can hear, command, Search, interact with information in newspaper through voice assistant.

1.2 Problem definition

In this project, we are going to achieve an advanced voice assistant based news web application with the help of Artificial Intelligence, Speech recognition so visually blind person can interact with news through command successfully and can have two way interaction.

2 LITERATURE SURVEY

[1]From the paper number 1: The basic plan of our work is to design and implement Artificial Intelligence based Voice Recognition System Software and to create a bundle that consists integration of several tasks, where we can process and execute using Clients Individual voice command. An Artificial Intelligent based Virtual or Personal Assistant were indicated as IVA or IPA could be a package of Intelligent mechanism which execute different tasks and services based on the queries and command for operating intelligent based system. It is identified as square measure at some areas of disciplines utilized for voice detection, where voice recognition is identified as communication channel between persons will be notified by machine. where machines can identify voice of a person wherever the voice is only approach of double communication, and a lot of typically, it permits to free-up each hands and vision doubtless for performing an additional action in comparison or facilitates conjointly inactivated individuals. This paper concentrated on the different artificial intelligent technologies that support the voice recognition and natural language processing. Generally, to try and do such quite tasks we would like a voice assistant to prefer and to get gadgets like Alexa. However identical practicality will be done by several the powerful packages like pywhatkit, Wikipedia, pyttsx3, pygame, speech recognition, OpenCV etc., we majorly focused on the practical implementation of voice recognition module based on the OpenCV.

[2]From the paper number 2: This paper presents JARVIS, a virtual integrated voice assistant comprising of gTTS, AIML[Artificial Intelligence Markup Language], and Python-based state-of-the-art technology in personalized assistant development. JARVIS incorporates the power of AIML and with the industry-leading Google platform for text-to-speech conversion and the voice of the Male Pitch in the gTTS libraries inspired from the Marvel World. This is the result of the adoption of the dynamic base Pythons pyttsx which considers intentionally in adjacent phases of gTTS and AIML, facilitating the establishment of considerably smooth dialogues between the assistant and the users. This is a unique result of the exaggerated contribution of several con-

tributors such as the feasible use of AIML and its dynamic fusion with platforms like Python[pyttsx] and gTTS[Google Text to Speech] resulting into a consistent and modular structure of JARVIS exposing the widespread reusability and negligible maintenance..

[3]From the paper number 3: Technology advancement allows people to live their life easier and more efficient. However, not everyone felt the same, as some people with disabilities such as the visually impaired still struggle in life despite the presence of technology or smart devices to help them. Whether it's a problem within the user interaction of the system or the cost that is too expensive, people suffering from visual impairment still struggles on their day-to-day activities. In order to solve the problem, they introduced DAVID a digital assistant application aim to help the visually impaired in recognizing text on real-world objects and provide an audio feedback in real-time. It utilizes voice user interface technology such as speech recognizing and speech synthesis as the means of interaction through voice input.

Sr no	Author Name	Year	Description
1	C. M. H. Saibaba, S. F. Waris, S. H. Raju, V. Sarma, V. C. Jadala and C. Prasad	2021	The basic plan is to design and implement Artificial Intelligence based Voice Recognition System Software and to create a bundle that consists integration of several tasks, which can process and execute using Clients Individual voice command. The major focus on the practical implementation of voice recognition module based on the OpenCV.

2	R. Sangpal, T.Gawand, S.Vaykar and N.Madhavi	2019	This paper presents JARVIS, a virtual integrated voice assistant comprising of gTTS, AIML[Artificial Intelligence Markup Language], and Python-based state-of-the-art technology in personalized assistant development.
3	E. Marvin	2020	Digital assistant application aim to help the visually impaired in recognizing text on real-world objects and provide an audio feedback in real-time. It utilizes voice user interface technology such as speech recognizing and speech synthesis as the means of interaction through voice input.

Table 2.1: Literature Survey

3 SOFTWARE REQUIREMENTS SPECIFICATION

3.1 Introduction

A software requirements specification (SRS) is a document that is created when a detailed description of all aspects of the software to be built must be specified before the project is to commence. It is important to note that a formal SRS is not always written. In fact, there are many instances in which effort expended on a SRS might be better spent in other software engineering activities.

3.1.1 Project Scope

The scope of the system is to increase further to extend the system:

- The proposed system scope is widely used to interact with virtual voice assistant.
- This system is used to detect voice commands and process it.
- To understand the query through AI and initiates a run-through NewsAPI to address.

3.1.2 User Classes and Characteristics

Sr no	Description	Class	Result
1	User register into system	User	Information stored into system
2	Give Voice Commands	System	Apply for process
3	Apply Algorithm	System	Check Voice model/ NewsAPI
4	AI voice output, Corresponding news	System	Result will generate

Table 3.1: User Classes and Characteristics

3.1.3 Assumptions and Dependencies

Until the test data will be used for providing the demo for the presentations. It is assumed that the user is familiar with an internet browser and also familiar with handling the keyboard and mouse. Since the application is a web based application there is a need for the internet browser. It will be assumed that the users will possess decent internet connectivity

3.2 Functional Requirements

- **Performance requirements:**

We use the better performance and fast process based on voice processing and detection.

- **Safety requirements:**

Here we don't have any hardware to harm any peoples, so no any safety requirement need in this system.

- **Software Quality attributes:**

Here we use advance software to develop this system.

- **Usability:**

This system use mostly all peoples but is developed specially for visually impaired people.

3.3 External Interface Requirements

3.3.1 User Interfaces

- Front-end software: Html, ReactJs, MaterialUI
- Back-end software: Google's Teachable machine, NewsAPI, Tensorflow

3.3.2 Hardware Interfaces

- RAM : 4GB
- HDD: 100GB

3.3.3 Software Interfaces

- **Operating system:** We have chosen windows/ linux operating system for its best support and user-friendliness.

3.4 Non-functional Requirements

3.4.1 Performance Requirements

For good performance, the server should be tuned to server only server process and most of the RAM should be used for our application. Good internet bandwidth for importing the packages for running the application and server can handle the request at a time.

3.4.2 Safety Requirements

For the safety purpose backup of the database must be required. It is used to avoid illegal use of the system, while using this System. The user first register and must login and logout each time they uses the System.

3.4.3 Security Requirements

The system should be safe because we use the windows system; with secure server therefore the system should have proper security so that it cannot be hacked.

3.4.4 Software Quality Attributes

Application will satisfy following software quality attributes:

- **Correctness:** System is planned in such way that it will give most correct output.
- **Reusable:** This software is reusable.

-
- **Availability:** As the system are a web application it is always available and no need of any hardware or software for its installation.

Also system satisfies other quality attributes such as reliability, Data Integrity, maintainability and Scalability.

3.5 System Requirements

3.5.1 Database Requirements

- **Logical Database Requirements:** A logical database can stretch over multiple physical hard disks and information files. The data storage unit is still a single database for information retrieval purposes. To have a logical database, all given hard disks and information files must be accessible from a single source.
- **Physical Database Requirements:** A physical database is technically a smaller unit of storage referred to as a company, field, record or table, depending on how much information the physical storage device contains. A field is the smallest unit of storage housing only a single file.

3.5.2 Software Requirements

- Windows/Linux OS.
- Front End: HTML, ReactJS, MaterialUI
- Database : Google's Teachable machine, NewsAPI, Tensorflow

3.5.3 Hardware Requirements

- Processor : Intel Core i3 or advanced
- RAM : 4 GB (min)
- Hard Disk : 200 GB (min)

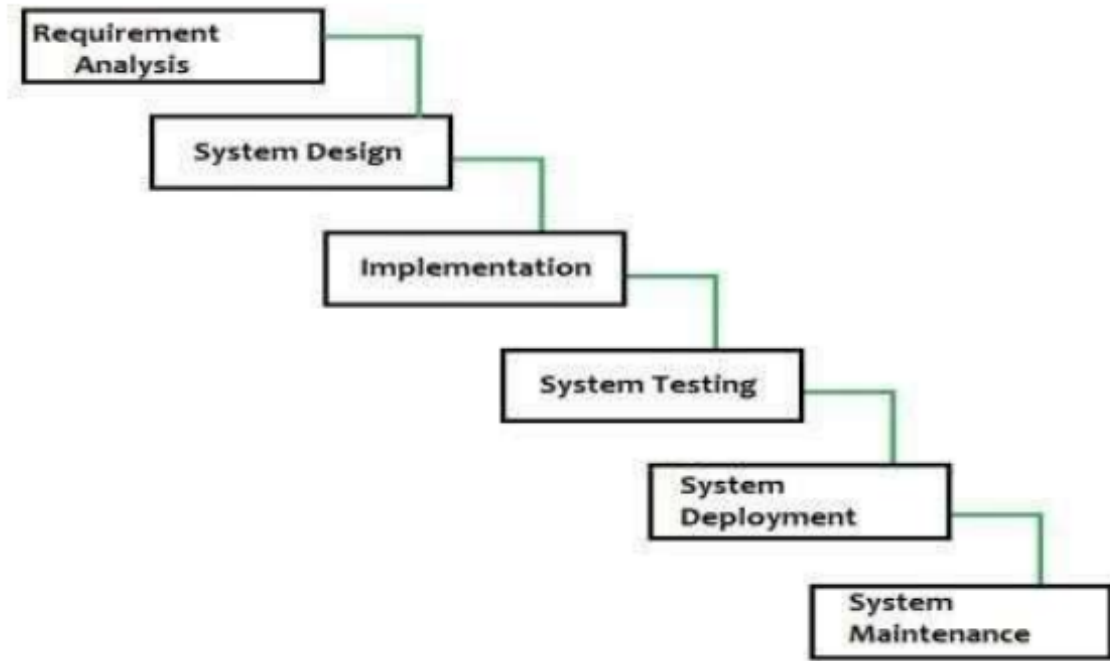


Figure 3.1: Waterfall model

3.6 Analysis Models: SDLC Model to be applied

In a waterfall model, each phase must be completed before the next phase can begin and there is no overlapping in the phases. The sequential phases in Waterfall model are

1. **Requirement Gathering and analysis:** All possible requirements of the system to be developed are captured in this phase and documented in a requirement specification document
2. **System Design:** The requirement specifications from first phase are studied in this phase and the system design is prepared. This system design helps in specifying hardware and system requirements and helps in defining the overall system architecture.
3. **Implementation:** With inputs from the system design, the system is first developed in small programs called units, which are integrated in the next phase. Each unit is developed and tested for its functionality, which is referred to as Unit Testing.

-
4. **Integration and Testing:** All the units developed in the implementation phase are integrated into a system after testing of each unit. Post integration the entire system is tested for any faults and failures.
 5. **Deployment of system:** Once the functional and non-functional testing is done; the product is deployed in the customer environment or released into the market.
 6. **Maintenance:** There are some issues which come up in the client environment. To fix those issues, patches are released. Also to enhance the product some better versions are released. Maintenance is done to deliver these changes in the customer environment.

All these phases are cascaded to each other in which progress is seen as flowing steadily downwards (like a waterfall) through the phases. The next phase is started only after the defined set of goals are achieved for previous phase and it is signed off, so the name Waterfall Model

3.7 System Implementation Plan

We have divided the implementation plan for proposed system in various set of activities which are needed to be carried out for successful implementation. Following timelines and tables represent the same.

Sr no	Task	Description	Days
1	Domain selection	Deciding the domain as network security for the project	15
2	Searching key terms	Searching key terms related to the domain	2
3	Deciding topic for project	Selecting Smart Crawler as project topic	10
4	Literature survey	Studied Papers related to smart crawler	20

5	Problem state- ment	Making the problem statement	10
6	Synopsis forma- tion	Forming the synopsis	15
7	Studying exist- ing system	Methodologies and drawbacks of existing system are made	15
8	Mathematical Modelling	For the mathematical model of project	25
9	Existing System	Implementation of existing system	60
10	Proposed system	Implementation of proposed system	70
11	Testing	Going through various types of testing	20
12	Data Analysis	Analysis of existing and proposed system	30
13	Report genera- tion	Latex report preparation	20

Table 3.2: Project Plan for Sem-I and Sem-II

3.8 PERT chart/ Gantt chart

A work plan is a complete accounting of how a person or grouping proposes going about accomplishing a specific task, approaching a project. Proposed work plan generally includes an introduction or overview of a project or job, a breakdown of how individual projectrelated tasks will be accomplished, a timeline for completion and cost projections for implementation. The above figure shows Gantt chart of proposed plan work this chart explain the plan of work there are total eight task.

Task 1 is study IEEE paper in 30 days, task 2 signify design of algorithm, task 3 represent design of GUI, task 4 represent pre-processing, task 5 signify the coding, task 6 represent Implementation it require 60 days to complete a work, task 7 correspond to Integrating modules and testing and task 8 is documentation.

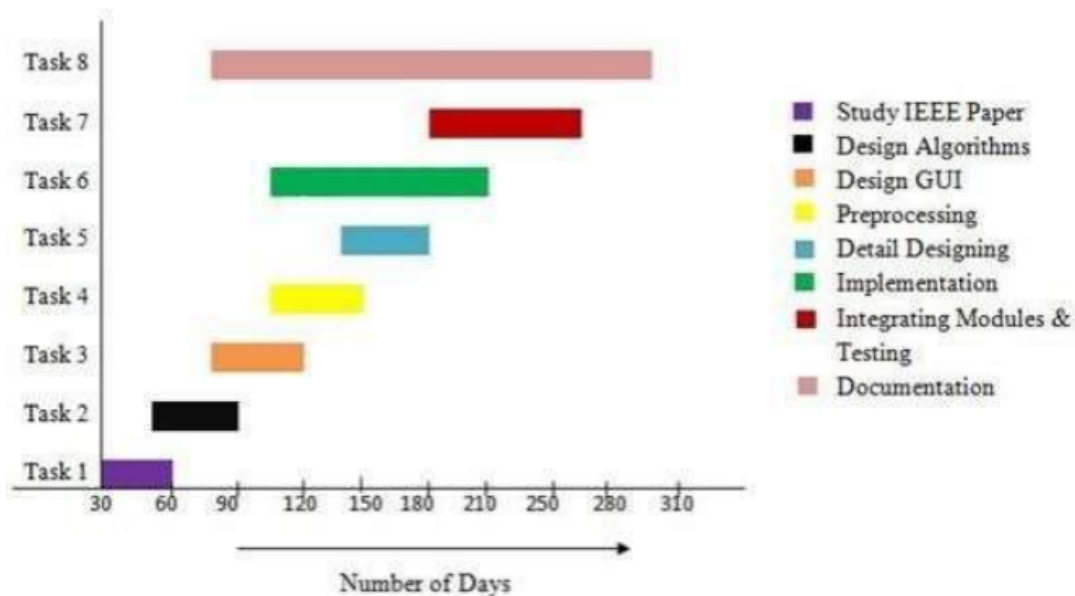


Figure 3.2: Project Plan for Sem-I and Sem-II

4 SYSTEM DESIGN

4.1 SYSTEM ARCHITECTURE

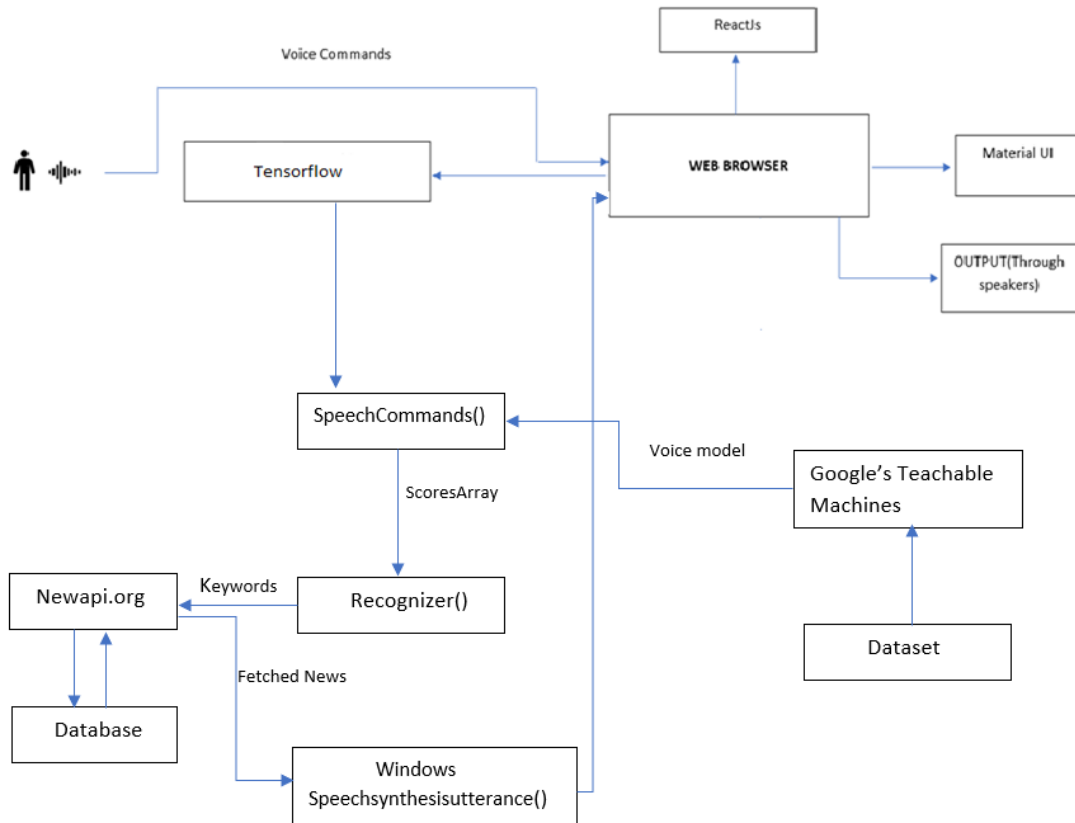


Figure 4.1: Project Plan for Sem-I and Sem-II

1. The whole architecture is made using SpeechRecognition python, reactJs etc. SpeechRecognition Library for performing speech recognition, with support for several engines and APIs, online and offline. Reactjs and MaterialUI provides us display screen, buttons and so on. So, in this way ReactJS helps us in design GUI.
2. After designing of GUI, another task is to authenticate valid user for operating application. To deal with this task, we are using Firebase database to store data of username and password and through this, user can authenticate easily.
3. Another task is to pre-process the input Voice Command which can be done by OpenCV library of python.

4.3 UML DIAGRAMS

4.3.1 Use Case Diagram

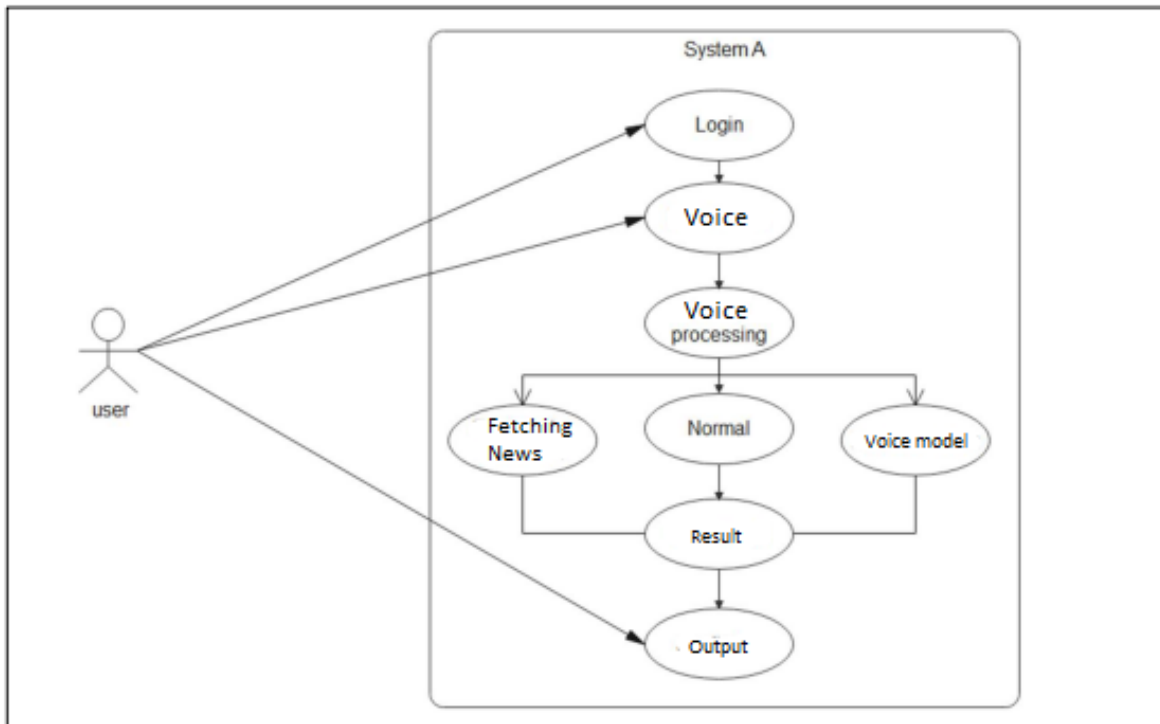


Figure 4.4: Use Case Diagram

4.3.2 Activity Diagram

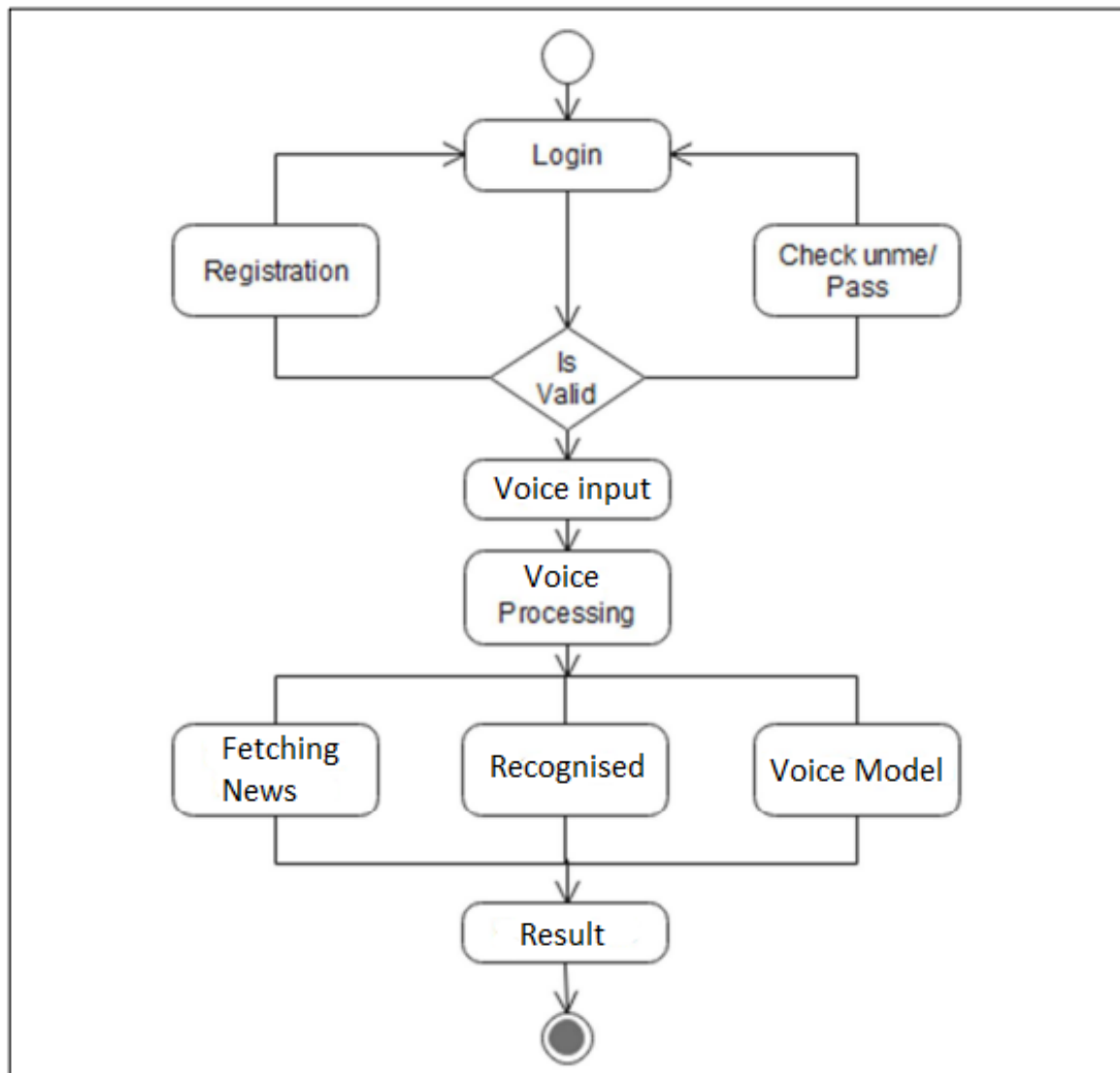


Figure 4.5: Activity Diagram

4.3.3 Deployment Diagram

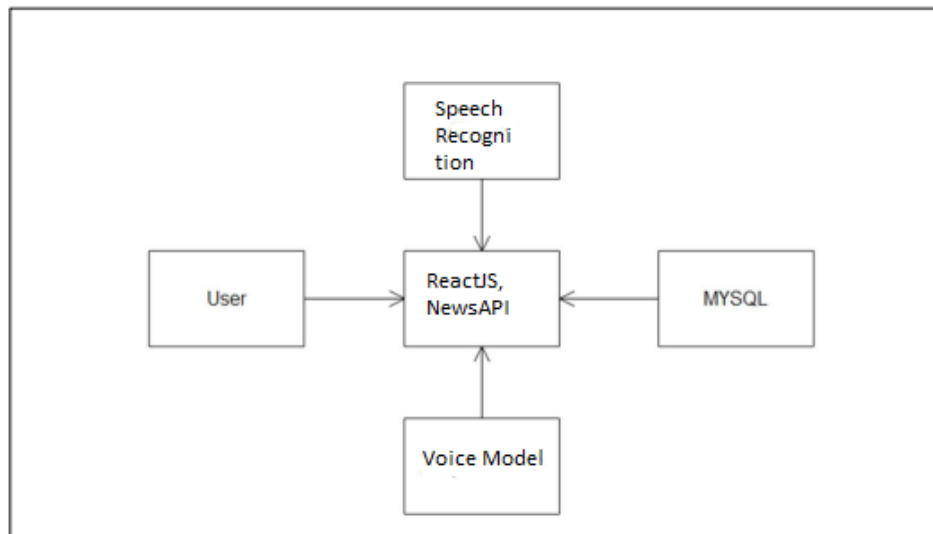


Figure 4.6: Deployment Diagram

4.3.4 Component Diagram

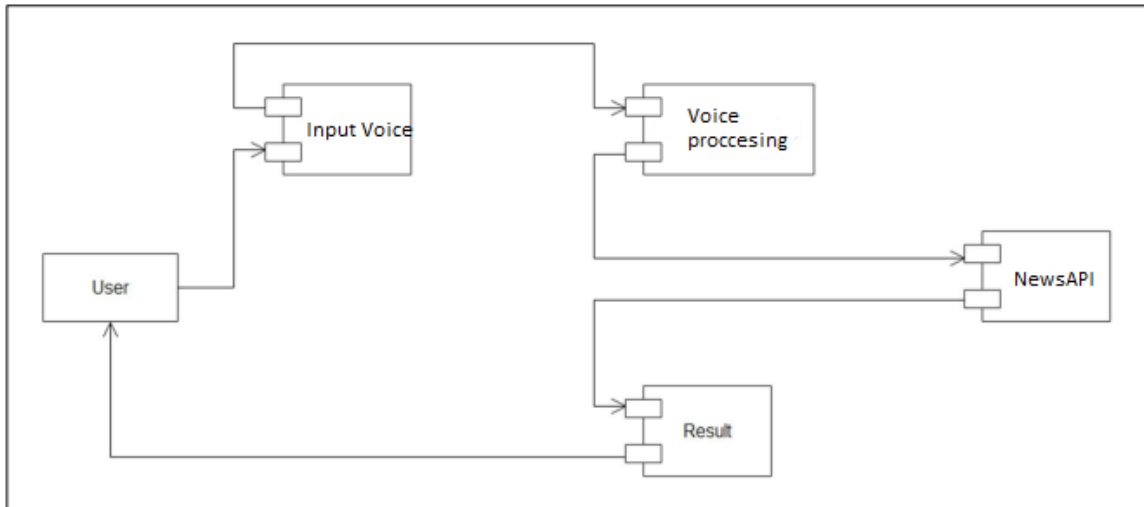


Figure 4.7: Component Diagram

5 OTHER SPECIFICATION

5.1 Advantages

- To take advantage of advance AI assistant.
- To assist visually impaired.
- To access news seamlessly.

5.2 Limitations

- If input Voice command is not detected then application also not work.

5.3 Applications

- Use in helping Visually impaired
- Use to seamlessly access news

6 FUTURE WORK

The Web application is very important in the awareness about the difficulties faced by visually impaired people and disabled people in general in our society . In future by using different types of AI based system we will try to ease the difficulties faced by these people.

7 CONCLUSION

We will introduce our website as a digital assistant, aims to help the visually impaired in searching and recognizing text on News articles and provide audio feedback in real-time.

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