A Conversational voice controlled Application

Final Year Project

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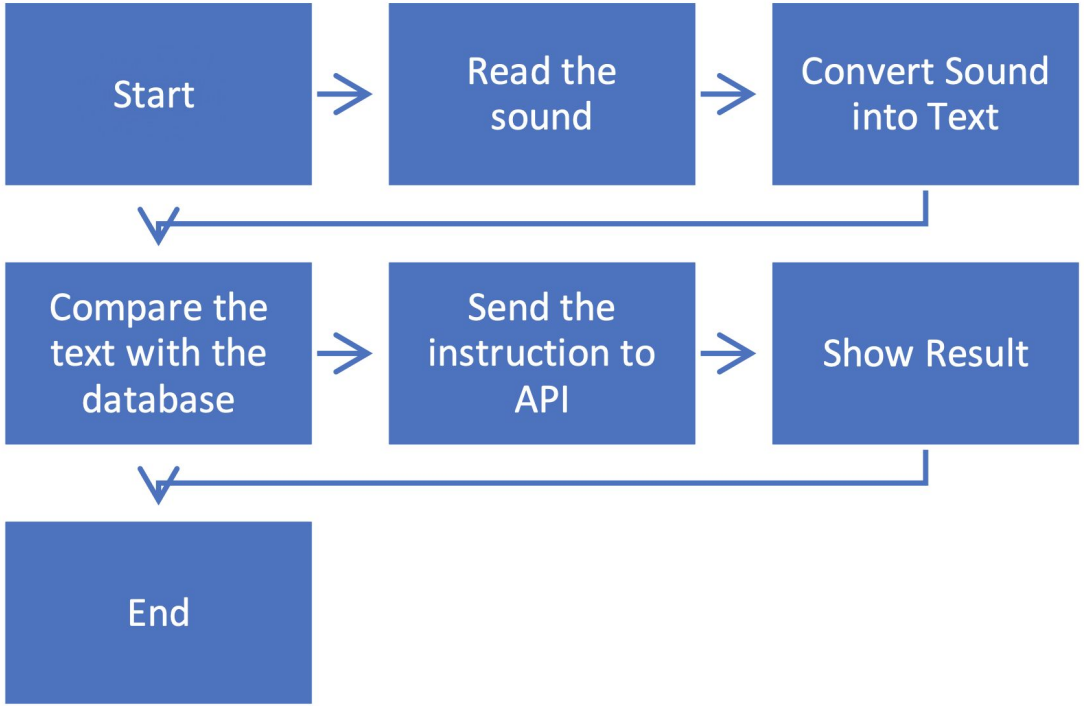
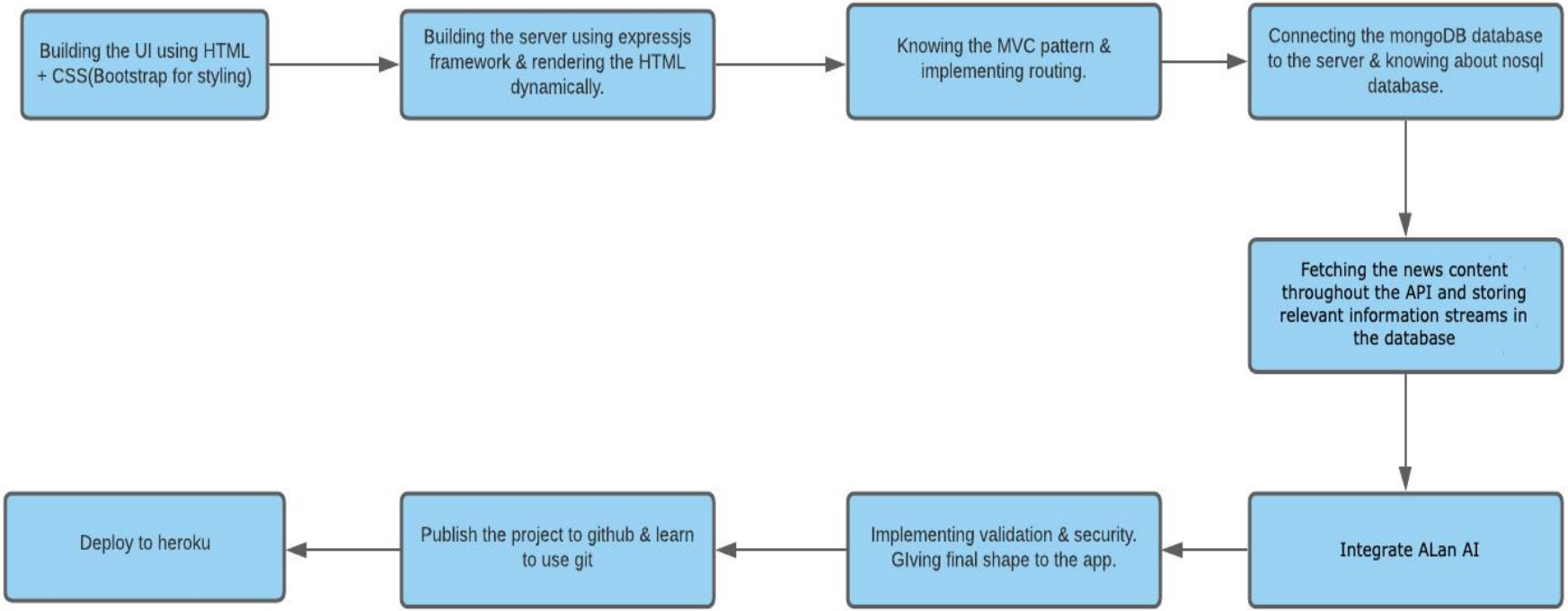
Abstract

“A conversational voice controlled app with authentication written in react and driven by Artificial Intelligence to provide the user with an interactive experience. The app is built in node.js runtime environment, using express for server side utilities and a NoSQL database(MongoDb) for storage and horizontal scaling.
With react we’ll be able to provide a responsive user interface that would work across all devices. We’ll target building an application that is easily scalable for a large user mass.”

Present Working Diagram



Workflow Followed



Literature Survey(Referenced From)

LipSurf by LipSurf.com

LipSurf lives and breaths on the web - giving you voice productivity and convenience on the tools you're already using daily.
You simply say things and LipSurf does them for you. It can be as simple as scrolling a page or playing a video,

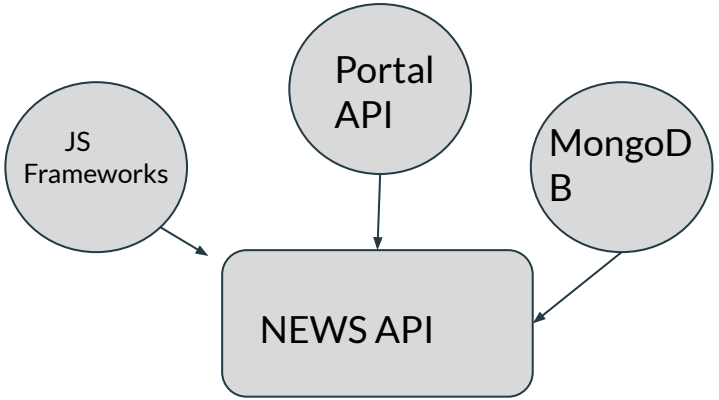
Voxpow

Speech recognition for websites
Recognizes more than 100 languages
Voxpow supports your global user base, recognizing more than 100 languages and variants. We use Machine Learning models to convert results, immediately returning text as the user is speaking.
Tiny JavaScript Speech Recognition library

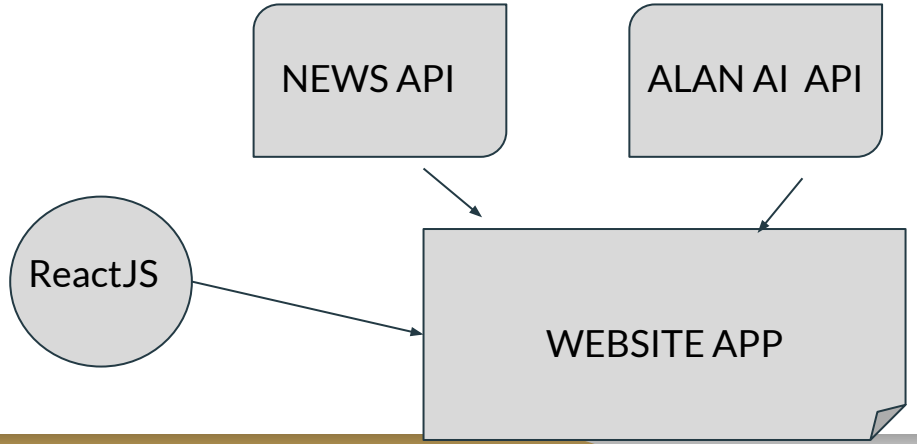
Link

A very high level design

NEWS API:
JS Frameworks, Portal API(Times of India), MongoDB

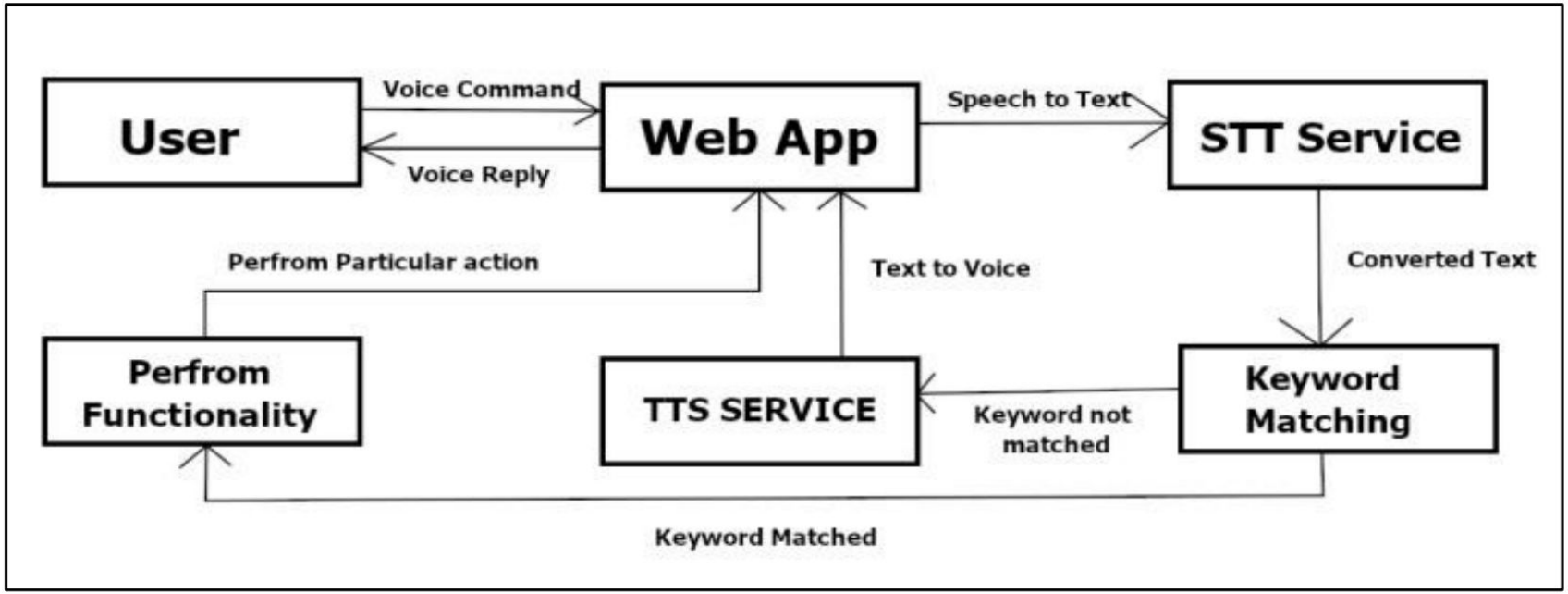


WEBSITE :
ALAN AI API + React Frontend + NEWS API

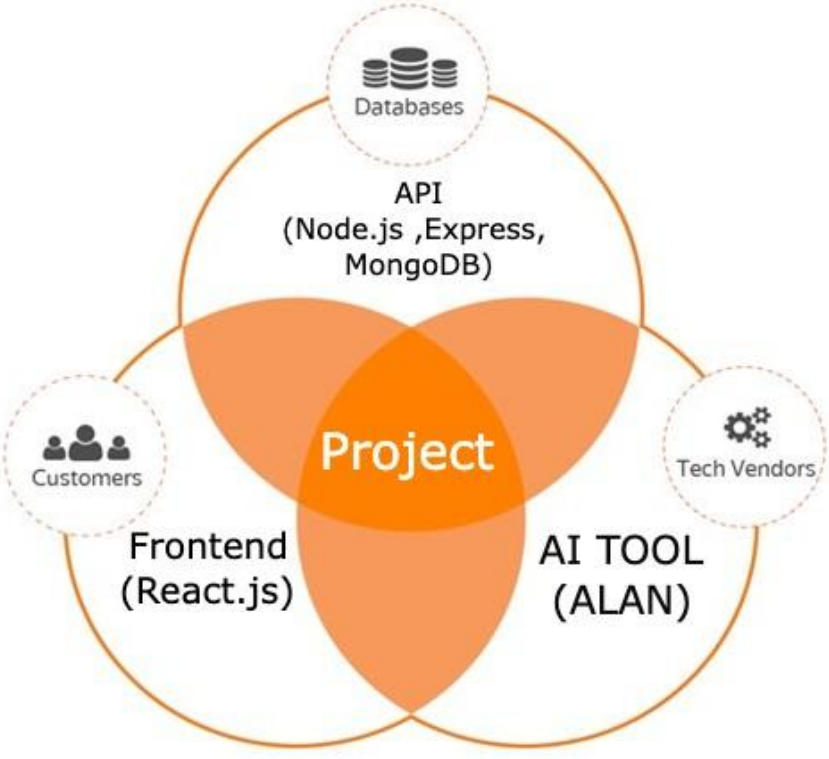


Low level Design

STT-> Speech to text
TTS-> Text to Speech



Introduction(Motivation)



The intersection of **Artificial Intelligence** and **Scalable** Web projects has always been a fascination for the three of us.

For the AI component we propose to implement a real-time talking tool

Live Verbal Chat is an integral part of good user/customer experience because it allows you to seamlessly connect with your websites' visitors/customers in real-time, directly on your website.

This unique set of characteristics distinguishes verbal chat from all other contact channels and can positively impact your business's success.

The AI Component

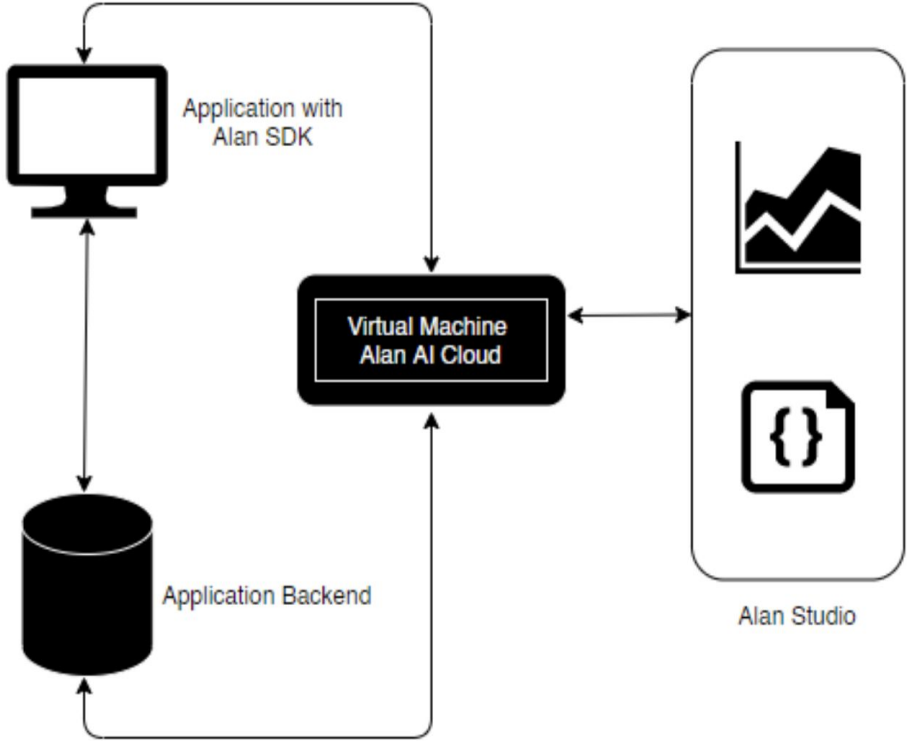
Alan is an advanced Voice AI Platform that allows you to add a voice interface to your app without overhead.

Alan is an end-to-end conversational AI platform to build robust and reliable in-app voice assistants and chatbots. There is no need to create spoken language models, train the speech recognition software, deploy and host voice components — the Alan AI backend does the bulk of work. With Alan, a voice experience for your app can be built and developed by a single developer, rather than a team of Machine Learning and DevOps experts.

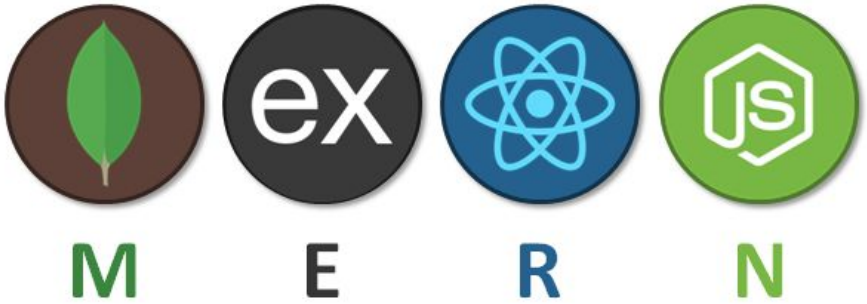
AI integration with ALAN

We presently are utilising the ALAN SDK for the integration of the AI component

```
var alanBtnInstance = alanBtn({
  key:
"0717498b05e694d0b083b897e50a49102e956eca572e1d8b807a3e2338fdd0dc/stage",
  onCommand: function (commandData) {
    if (commandData.command === "go:back") {
      // Call client code that will react to the received command
    }
  },
  rootEl: document.getElementById("alan-btn"),
});
```



TOOLS



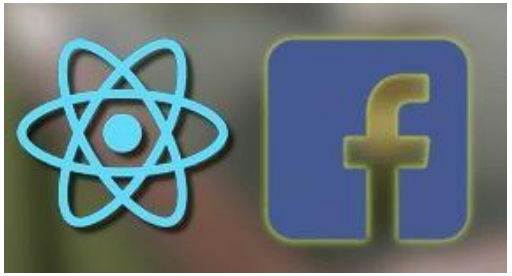
1. AlanAI
2. JavaScript runtime(NodeJs)
3. JavaScript frameworks (React, Express)
4. NoSQL Databases (MongoDB, Redis)

NodeJS

An asynchronous event-driven JavaScript runtime, Node.js is designed to build scalable network applications. Many connections can be handled concurrently. Upon each connection, the callback is fired, but if there is no work to be done, Node.js will sleep.

ReactJS

Created by Facebook.
React makes it painless to create interactive UIs. Design simple views for each state in your application, and React will efficiently update and render just the right components when your data changes.



ExpressJS

Express.js, or simply Express, is a back end web application framework for Node.js, released as free and open-source software under the MIT License. It is designed for building web applications and APIs. It has been called the de facto standard server framework for Node.js.

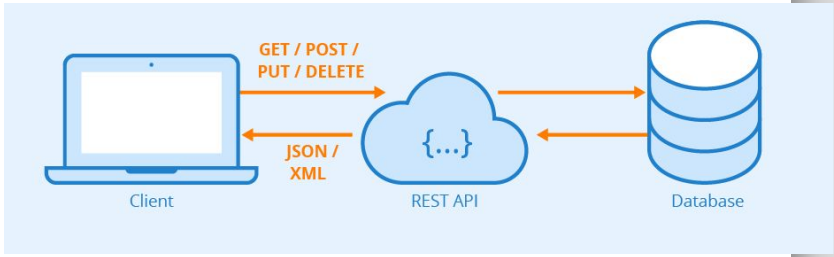
Express JS

MongoDB

MongoDB is **an open source NoSQL database management program**. NoSQL is used as an alternative to traditional relational databases. NoSQL databases are quite useful for working with large sets of distributed data. MongoDB is a tool that can manage document-oriented information, store or retrieve information.

REST API

Representational state transfer is a software architectural style that was created to guide the design and development of the architecture for the World Wide Web. REST defines a set of constraints for how the architecture of an Internet-scale distributed hypermedia system, such as the Web, should behave.



Features

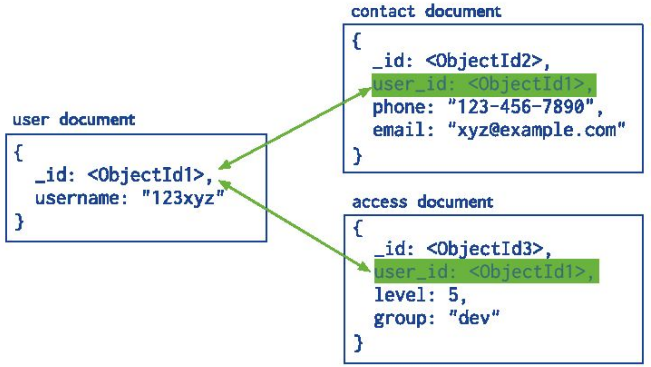
1. Authentication and authorization using **PassportJS** and **JWT**

2. Model validations using express-validator

3. Data modeling and schema construction using Mongoose

4. Categories, stories, videos and comments C authorized or protected routes

5. Emails sending, data pagination, rate limiting, and image uploading.



Experimental Results

Number of words searched	Number of keywords identified	Related articles fetched	Unrelated articles fetched
1	1	20	0
2	1	20	0
3	1	20	0
4	1	19	1
5	2	18	2
6	2	18	2
7	3	16	4
8	3	16	4
9	3	14	6
10	4	14	6

Limitations

- Limited Functionality relevant to the website

- Language barrier , understands only English

- Issue with input devices

- Background Noises

-Not able to navigate through other words which are Not Relevant to the Website

Takeaways from the project

1. We would be able to get hands-on experience on frontend development in React and backend technologies like nodejs along with interaction with databases like MongoDb.

2. It would also strengthen our concepts and we would get a more solid understanding of how cloud computing is instantiated in modern world applications and the level of sophistication involved in making these technologies communicate with each other seamlessly.

3. This would also give us a first hand experience about AI, its numerous applications and how those technologies could be integrated into an application that serves multiple purposes without us having to reinvent the wheel.

4. We would also get familiarized with the best practices used around Software Development and the rationale behind them, as we try to think our way through the problems that we would face.

References

[1] https://nodejs.org/en/docs/

[2] https://expressjs.com/en/advanced/developing-template-engines.html

[3] https://www.algoexpert.io/systems/product

[4] https://alan.app/docs/

[5] https://www.simform.com/blog/building-scalable-application-aws-platform/

[6] https://www.w3schools.com/nodejs/nodejs_mongodb.asp

THANK YOU!