AN INTERACTIVE VOICE CONTROLLED APPLICATION INTEGRATED WITH ARTIFICIAL INTELLIGENCE USING ALAN STUDIO

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Abstract:

Newspapers have been a predictable asset for disseminating important data and experiences to us since 1566. Numerous mechanical advancements drove the majority to present day approaches to conveying news and data about different viewpoints. Since the time the beginning of innovative headways, for example, Artificial Intelligence, scientists and designers have applied Artificial Intelligence upon different fields. The idea of News Application with an interactive Voice Assistant gives an oversimplified approach and simplicity to the user. This provides a great advantage to the people who have very busy schedule and have difficulty in reading. The application provides all the features required for a user to be able to use voice/speech as a medium to look for the news of his/her choice and allows user to go through the news in a very detailed manner by interacting with the assistant. A voice assistant embedded in a web application enables the user to have the ability to not only stay informed and updated but also makes use of one of the most sought-after technologies in the world right now. The application is built in such a way that all the services provided by the website are accessible by the user with his/her voice command. The project has been developed using ReactJS, Alan AI, News API, OpenWeather API.

Keywords: Artificial Intelligence, Voice Assistant, Voice Commands, Alan AI, React JS, News API, OpenWeather API

1.Introduction

Long laid out news gathering techniques, for example, Newspapers, radios, and TVs have sustained for quite a while. In the advanced period, we are extremely acclimated to use cell phones and PCs for different needs. Albeit the deep-rooted strategies are functioning admirably, news gathering has never been extremely intelligent. With quick progressions in figuring innovation, we have been drawing nearer to foster Artificial Intelligence (AI) arrangements which can reshape the entire world. Artificial Intelligence in some cases additionally called Machine Intelligence is a progressive and developing part of software engineering, equipped for performing errands that were believed to be unimaginable for a customary machine.

To make life simpler, progressions are being made in innovation, and voice control is one of the main advances which are progressively being carried out on furthermore, more gadgets. Voice control has become one of the most popular abilities. An ever-increasing number of uses and administrations give voice control

facilities. Voice control give an extremely simple insight for the client and empowers him to utilize the assistance without having to genuinely utilize the gadget with his/her hands.

The cutting-edge ways of life don't permit us to take time from occupied timetables to plunk down and read papers, magazines and so on to get us informed about the most recent occasions happening all over the world. With each progressive age, the general public battle much more to remain educated and taught about the world. Perusing and achieving the most recent news was an all-around pursued routine that was followed by a gigantic piece of the general public that appears to get neglected continuously. With the inclusion and presentation of innovation, it is seen that better approaches for news perusing are getting supplanting old strategies. News is physically altered to get the notice of its user and is even accessible in a short, to the point design. There are different major, enormous news applications that give e-papers and a significance of information as warnings or updates for their users and clients. With each new article, the user gains information about the occasions occurring across the globe. News perusing is the fastest and best method for social event information about state and worldwide news. Since news organizations cover all subjects of interest like Fashion, Lifestyle, Politics, Sports, Entertainment, the user continually stay updated.

1.1 Branches of AI and their recent advancements:

AI is the study of planning frameworks that display comparable attributes related with the insight found in human way of behaving. A huge part of software engineering manages framework acknowledgment like reasoning, understanding, figuring out language, and making moves to tackle issues[5].

Expert Systems: Expert Systems is an AI-based framework that learns and mimics an individual's thinking skill. It doesn't utilize ordinary programming to tackle complex issues yet rather utilizes sensible documentations to accomplish such a point. It is fundamentally utilized in the clinical field to distinguish infection contaminations. It is additionally utilized in the financial area for credit and speculation investigation.

Robotics: This is an exceptionally fascinating part of Artificial Intelligence that spotlights on the plan and improvement of robots. Advanced mechanics manages the planning, building, and working of robots by integrating both science and designing methods. The point of sending robots is to assist people with drawn-out and cumbersome assignments. These errands include the control of PC frameworks, data change and assembling of cars. It is utilized by NASA to move weighty articles in space. Robots likewise go about as man-made reasoning specialists that perform assignments in a certifiable climate determined to complete outcomes. This part of AI is so astounding.

Machine Learning: ML is an important part of Artificial Intelligence. The science empowers machines and PC frameworks to process, dissect and decipher information fully intent on giving answers for genuine difficulties. Computers can learn and make moves all alone because of the degree of adequate information gave through Machine Learning. The calculation is set up so that machines can anticipate results considering previous events. Machine Learning strategies help in preparing a model with information introduced which will then, at that point, anticipate and acclimate to future results. It is the study of permitting computers to learn and interpret information for task execution without programming. Innovation revelations.

Neural Networks: It is a part of Artificial Intelligence related with the utilization of Neurology to integrate mental science in aiding PC frameworks and machines to execute undertakings. It is also called as "Deep Learning" since it includes utilizing artificial neurons to solve complex issues. It assists machines with handling how the human mind works. Face recognition is a consequence of the execution of Neural Network. This great part of AI is likewise answerable for menial helper applications, for example, "Alexa and Siri".

Fuzzy Logic: This part of AI is the strategy of changing and addressing questionable data by investigating how much the theory is valid. This assists with offering a specific degree of thinking adaptability when confronted with vulnerabilities. This could sound a piece complex however it is basically an instance of utilizing standard logic to decide whether an idea shows a level of truth. Similarly, as people face situations in their everyday exercises, a PC framework can be made to experience such fully intent on tracking down an answer. Fuzzy Logic is utilized in programmed gearboxes and medication for independent direction.

Natural Language Processing: Speaking with somebody who doesn't comprehend your language can be exceptionally difficult and the equivalent can be said to describe people attempting to speak with a PC framework. A PC will find it hard to decipher words since it just figures out the language of parallel digits. This challenge has prompted the advancement of Natural Language Processing in software engineering. This is basically the method involved with making PC frameworks and machines to grasp important human collaborations. This cycle includes a machine getting human sound from connection and changing it over completely to message design, so it tends to be handily perused and perceived. These texts are then switched over completely to parts by the PC framework that will cause it to grasp the aim of the human.

The part of Natural Language Processing plays a vital role in this project. The commands of the user should be perceived by the system to finish a request.

1.2 Tools and Technologies used:

Alan AI: Alan Conversational Platform [4] permits designers to make several assistants, similar to Google (Assistant), Amazon (Alexa), Apple (Siri), but confined to a particular application. Alan makes web application more adaptive with improved user interface and updates. With huge number of engineers on the Alan Community and proceeding to develop more, in-application assistants are turning into an absolute requirement for any application. Alan is an exceptionally progressed framework that incorporates BDA, ML, voice and speech recognition, NLP, and other trend setting innovations.

React: React [1] is one of the JavaScript library used for creating UIs. It uses component-based architecture where each component is independent of each other which can be reused throughout the project. It is mainly used to build webpages and mobile applications.

News API: News API gives top headlines including both historic and current news stories in JSON format. It is simpler, user-friendly, easy-to-coordinate REST API
   a. **Overall Scale –** News API [2] allows developers to fetch news from huge number of resources 55 nations in 14 different languages.
   b. **Simple Co-ordination** - News API returns results in JSON format which are obtained with the help of SDK or HTTP GET requests.
   c. **No cost Upgradation** – Without using any payment developers can directly hop on to a trial version of News API.

Visual Studio Code: Visual Studio Code [12] also known as VS Code is a most widely used editor which can run on Linux, Windows, MacOS. It supports wide number of languages namely C, C++, C#, Java, Python, Ruby, JavaScript, Perl, Dart, PHP etc. It became so popular, as developers find it simpler among the other editors available in market. Its properties are as follows:
   a. Intelligent Code Completion
   b. Streamlined Debugging
   c. Fast, Powerful Editing
   d. Code Navigation and Refactoring
   e. In-Product Source Control
   f. Top Extensions
   g. Embedded Git & Terminal

1.3 Idea of the project:

With incredible progressions in AI, we have offered a methodology for advancement in the field of information innovation. In this project, we have utilized Alan AI to assist with getting the client a news that they want to be aware of. Whenever a client gets some information about a subject, the AI orchestrates their speech into orders that can then be utilized to assemble data from different applications. We have utilized ReactJS to foster the front-end of this application and JavaScript for in the background activities. Visual Studio Code was our supervisor of inclination. Adding this multitude of advancements together, we advanced to building an involved project.

2. Literature Survey

R. Dale et al. (2019) [7] worked on reviewing different areas that have contributed to ongoing advancements in the growth of voice-based technologies especially in the business sector. He explained about growth in the field of voice assistance, battle of the giants (Alexa vs Google Assistant), Conversational ability, Tools required, privacy, synthesis of speech and universality of voice.

A. Karthik, V. K. Raja, and S. Prabakaran et al. (2018) [8] worked on constructing a device which helps visually impaired people for programmed acknowledgment of the environmental messages using OCR sensor and Raspberry pi. They worked on integrating Text To Speech which converts the text available in the environment to audio/speech which makes them to understand and interact easier with the surroundings.

J. Gnanamanickam, Y. Natarajan, and K.R.Sri Preethaa et al. (2021) [9] worked on a special algorithm which is named as Hybrid Speech Enhancement Algorithm. This algorithm is used in voice assistant applications which maily focuses on reducing errors in the words. The algorithm proposed by them resulted in maximum accuracy of 90.5% with just 9.5% word error rate for speech data and an accuracy of 92.4% with 7.6% word error rate for audio data.

G. Terzopoulos and M. Satratzemi et al. (2019) [10] made a study on how important the use of voice assistants and smart speakers are in the field of education and everyday lives. They took one of the major challenges that the present voice based technology is lacking which is the ability of an assistant to speak languages other than English. This research gave a huge support on integrating voice assistants into education which is quite similar to my idea.

Ian W. Freed, William Folwell Barton and Rohit Prasad et al. (2014) [11] worked on prevention of false wake words which are often detected whenever a voice assistant or voice controlled device is active. The research paper is all about the drawings illustrating the actual working of voice-controlled device with in-depth word modules which classify actual words used for interaction preventing false wake words.

Ranking	App Store Downloads	Google Play Downloads
1	Toutiao	Public
2	Tencent News	Cricbuzz
3	FlashScore	News Break
4	News Break	Google News
5	SmartNews	Aaj Tak
6	CNN	Opera News
7	BBC News	SmartNews
8	NetEase News	Onefootball
9	Qutoutiao	Dailyhunt
10	Fox News	Briefing

Table 2: Top News Apps Worldwide for January 2020 by Downloads

Toutiao was the most downloaded news application overall for January 2020 with 6.3 million downloads. China represented in excess of the vast majority of these downloads. Public was the second most downloaded news application with 2.6 million downloads. The country with the highest number of Public downloads was India at 99.2 percent of its total downloads.

Ranking	Application	Publisher
1	Dailyhunt	Eterno Infotech
2	Hindi News	Dainik Bhaskar Group
3	Google News	Google LLC
4	Briefing	Flipboard
5	Inshorts	Inshorts
6	Gujarati News	Dainik Bhaskar Group
7	Opera News	Opera
8	NewsPoint	Times Internet Limited
9	Quora	Quora, Inc.
10	Times of India	Times Internet Limited

Table 2: Top News Apps India for May 2022 by Downloads

3. Implementation

The execution of this news application can be separated into three sections which are Frontend which is designed using ReactJS, API associations among frontend and backend, and Backend programming using ALAN AI.

The front-end was designed utilizing ReactJS. As referenced above, ReactJS is an Opensource JavaScript library kept up with and created by Facebook, it is utilized for the advancement of UI Components. Components are one of the most important building blocks as they can be reused as many times as the application demands. React can be utilized with different systems on the server-side and as well as the client-side.

The fundamental reason for picking React for frontend was that it permits us to make a web application with huge data and furthermore the changing of data on the application doesn't expect us to reload the page. The delivering system of React is finished by utilizing the Virtual DOM which is quick. This quick delivering was expected in a project like this where the user is using the web application with their voice.

Material UI [3] then again is a famous React UI application. It permits the designer for quick improvement of the application by providing different components. These are some of the components that are used in this project: Card, CardActions, CardActionArea, CardContent, CardMedia, Button, and Typography.

API is a courier that takes requests and lets a framework know what the client needs and afterward returns the response. It acts as a software that gives an establishment to connect two applications. This connection is then used to send requests starting with one application then onto the next and receive a response consequently. API can be expressed as the genuine to for backend connection between different applications.

User can ask weather updates of particular location using voice commands. The application is capable of giving weather forecast for 5 days and historic weather report too. OpenWeather API have different GET requests which can be used to get different updates such as 16 day forecast, 30 day forecast, current weather data, hourly forecast for 4 days etc., User first needs to specify the location when prompted by the application. The application stores the location and sets it as default location throughout the session. If in case user wants to change the location he can ask the application using voice command of that particular location.
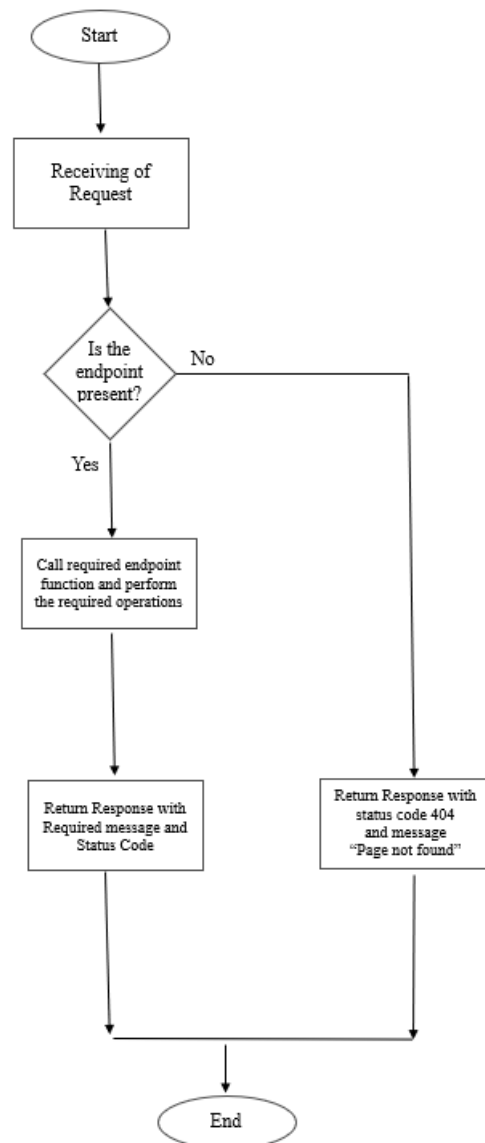
Fig 1. Working of Rest API

Three APIs were used in this project. Each application has its API key to interface with your application. The three keys were from NewsAPI, OpenWeatherAPI and Alan AI. Utilizing the NewsAPI, one can look and recover precise and current on-going news across the globe. A ton of inquiry sets are accessible, one can look and recover news by terms, classification, or by any news sources.

The application developer can redo the inquiry for the specific news. This HTTP REST API permits the designer to get to speedy news according to the given request. The frontend was created by the elements of this API as there are cards as per the news by terms, class, or by any news sources.

The basic syntax of HTTP GET request for getting the news has 2 endpoints which are "top-headlines" and "everything".

- If "everything" is used as an endpoint in the GET request all the articles regarding the given keyword or source are obtained in the output. Its basic syntax is

GET https://newsapi.org/v2/everything?q=bitcoin&apiKey=API_KEY

By using the above GET request all the articles on bitcoin from various resources is obtained as the results in JSON format.

- If "top-headlines" is used as an endpoint in the GET request all the headlines related to the given keyword or source are fetched as results. Its syntax goes like

**GET https://newsapi.org/v2/top-headlines?country=us&apiKey=API_KEY**

By using the above GET request all the top-headlines related to US from various resources is obtained as the results in JSON format.

These are some of the examples that are made accessible in the project for fetching news from NewsAPI. Similarly, user can ask news based on terms, categories, countries, and sources. OpenWeatherAPI[6] is responsible for weather updates as weather forecast is one of the main aspects of News.

The project offers a new, quicker, dependable, simple to utilize furthermore, an outstanding experience that assists the client with remaining informed and remain refreshed with the occasions occurring around the world. The framework can distinguish between the different keywords being said by the client and along these lines ready to return the news as indicated by the question given by the client. The framework recognizes different sources, areas, points and topics of the news that may be fascinating for the client.

As the quantity of words increase, ultimately the quantity of keywords moreover increases and the framework additionally brings news stories related to the keywords. In this manner, an assortment of news stories are fetched which may not be connected with the general pursuit inquiry yet connected with the specific keyword distinguished by the program. But the program figures out how to bring a more noteworthy number of related articles when contrasted with the quantity of irrelevant articles brought.

Alan conversational platform provides the voice recognition facility and processes the vocal directions given by the client by distinguishing the keywords for the request that the client has inquired. The keywords that are distinguished are gone through the NEWS API that looks for the news stories about the chosen keyword and returns the JSON record containing all the literary information that the articles contain. Material UI assists with removing the information from the JSON document and it passes the removed information to the Alan studio which examines the information and converts into voice and recites the articles to the client.
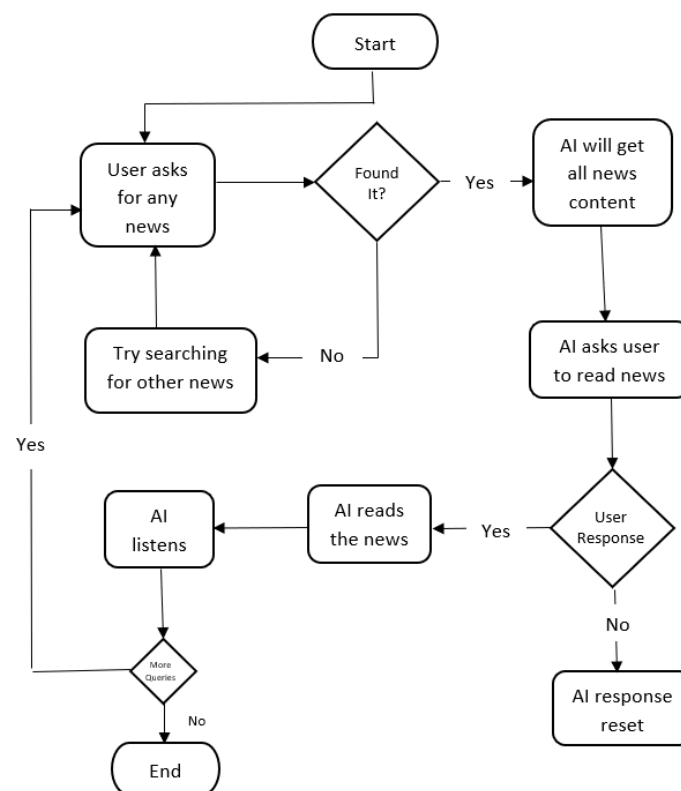

Fig 2. Working of the application

4. Results and Analysis
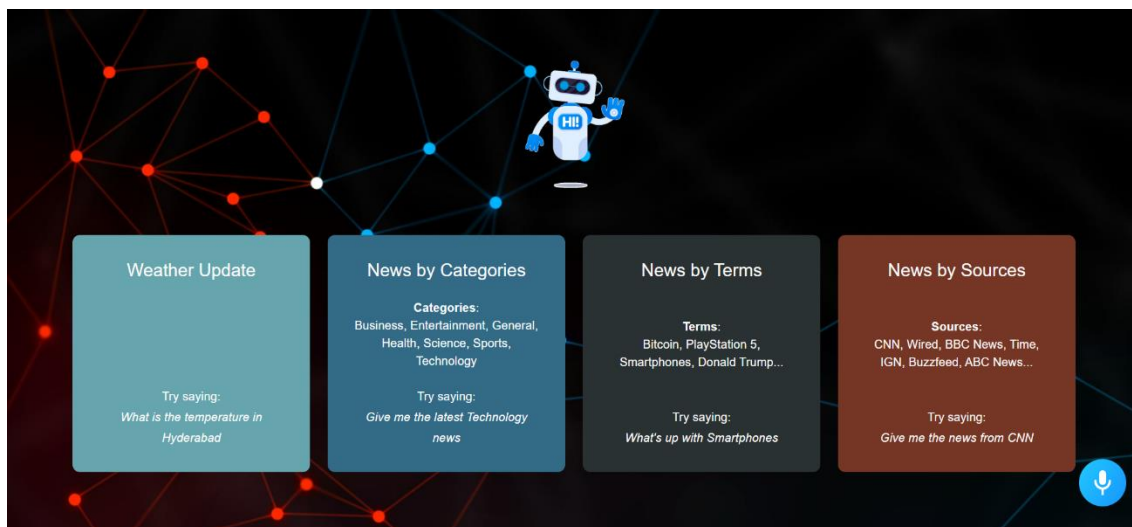

Fig 3. Home Page of the AI News Application

The homepage consists of sample commands in order to get started with the application. There are several cards which specify different varieties of news offered by the application. The cards give directions to new user to access news based on category, term or a source.
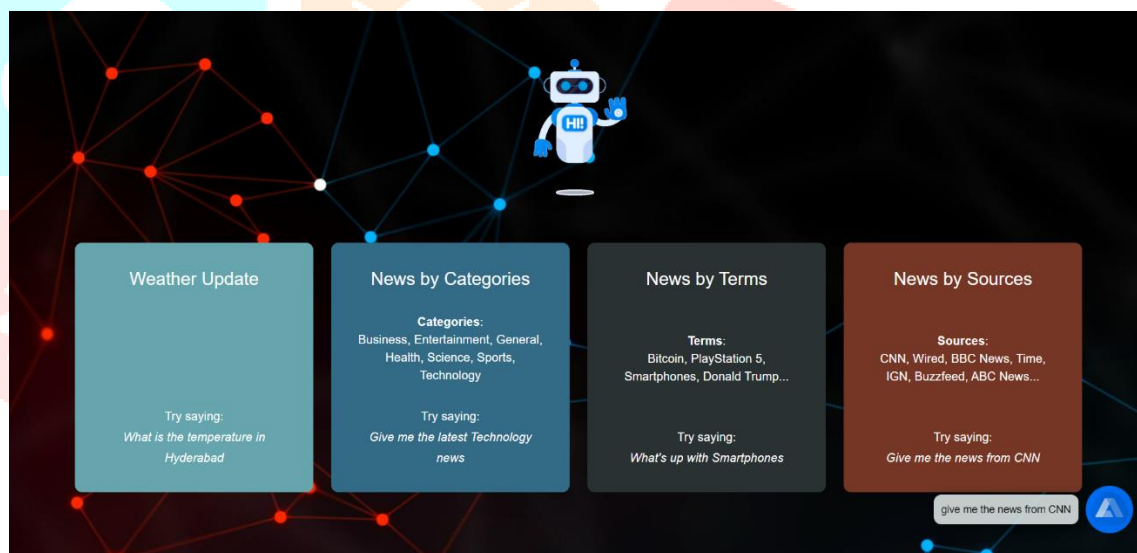


Fig 4. Using voice command to find news

The Alan voice assistant is activated by tapping the mic symbol that is placed on the bottom right corner of the application by default. The mic can be placed anywhere according to user interest and user can ask commands after activating it. The mic becomes inactive after 30 seconds of inactivity.
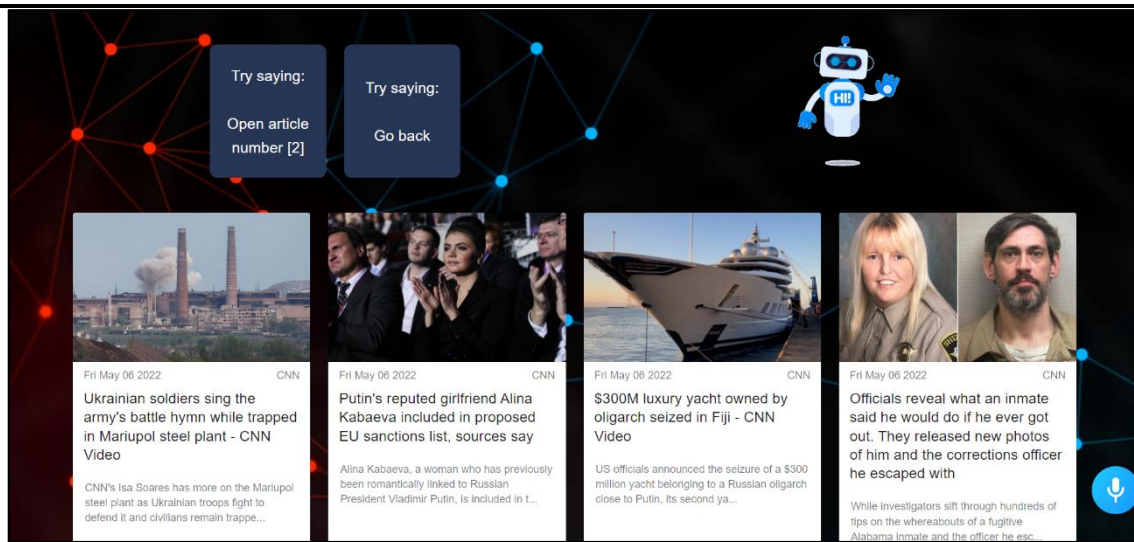
Fig 5. List of articles that are obtained based on voice command

After a successful request, News API fetches the news related to the keyword filtered from the given voice command. News API fetches 20 articles by default per API call. Based on the news available the cards can be from 1-20 in number. The news cards consist of the title i.e., headlines, Timestamp, source and short description about the news article. The user can proceed to the detailed information about particular news article based on the indexing of each article which is at the bottom right corner of the card. User can ask assistant to read the headlines that are fetched from NEWS API.
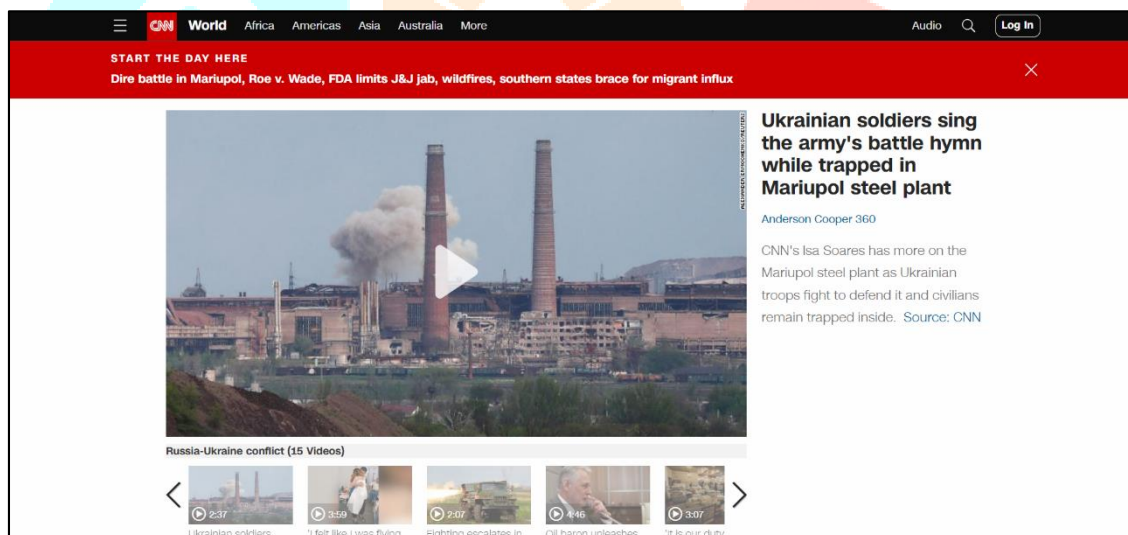
Fig 6. Target Page for more detailed information

The above figure is the target page where the detailed news can be seen. The user can still able to access the voice assistant as it is running in the background of the web application. User can navigate through pages using voice commands which helps great number of users making it simpler and user-friendly in nature.

5.Conclusion

Traditional way of reading Newspapers and magazines kills lot of time as people ordinarily spends finding out about articles in which they are not intrigued. With the help of this project, the client can get the news related to topics related to his/her interest in an instant. The application has the ability to read every title of the news stories and can open the source article for more detailed news whenever expected by the client. Alan can be coordinated into a lot more applications in the field of medical care, business, banking, and online business applications. Taking everything into account, we propose that the reconciliation of voice aides in news applications won't just upgrade the client experience yet additionally make news more captivating soon.

This project helps many people to stay updated and refreshes while utilizing as less time as could be expected. Users get educated and be well proficient with the events that are occurring round the globe in a very simple and intriguing manner. Individuals with restricted time currently can undoubtedly get up to date just with the help of voice assistance.

This project helps people suffering with visual impairment and locomotor disabilities by empowering them to be up to date with the events happening in the world irrespective of their medical condition. We thus conclude our research with successful completion of the project.

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