International Journal of Trend in Scientific Research and Development (IJTSRD)
Special Issue on Emerging Trends and Innovations in Web-Based Applications and Technologies
Available Online: www.ijtsrd.com e-ISSN: 2456 – 6470

VISIONary News: Empowering the Blind through Interactive Audio Updates

Aastha Chaware[1], Atharva Lingayat[2], Rahul Baingane[3], Anushka Chaudhary[4], Bhumika Shingade[5], Aditya Sathyan[6]

[1,2,3,4,5,6]Department of Science and Technology,
[1,2,3,4,5,6]G H Raisoni College of Engineering and Management, Nagpur, Maharashtra, India

ABSTRACT

Information access is a basic right, but visually impaired people usually have great difficulties accessing news through the conventional means. To overcome this challenge, "Visionary News: A Voice-Interactive Solution for Accessible News Delivery to the Visually Impaired" introduces a revolutionary, voice-based platform that delivers real-time and personalized news content. The solution takes advantage of the latest advancements in artificial intelligence, voice recognition, and natural language processing to develop an easy-to-use and user-friendly system that enables visually impaired users to access news without any hassle.

The site offers a variety of capabilities, such as voice-guided navigation, multi-lingual capabilities, and adaptive content presentation based on personal preferences. By combining these technologies, Visionary News guarantees an accessible experience that supports autonomy and accessibility with less dependence on assistive devices or third-party aid. The system further focuses on context sensitivity in interaction to allow users to easily access information, whether breaking news, specialized knowledge, or detailed reports.

Besides meeting the functional requirements of the visually impaired, this solution also supports overarching societal objectives through social inclusion and narrowing the digital information accessibility gap. Visionary News illustrates how technology can be used to develop inclusive opportunities for marginalized communities, allowing them to remain informed and active participants in global discussions.

INTRODUCTION

Access to timely and accurate information is vital in today's interconnected world enabling individuals to make informed decisions. It is so crucial that it supports the influence of opinions in debate and societal discourse as well as helps develop a broad coalition together However for individuals with visual impairments, consuming news content via traditional mediums such as print media TV platforms or Internet platforms remains an important challenge. Although innovations in technologies are under way accessibility barriers persist which often leave this community underserved and disconnected from the flow of current events. This lack of access not only exacerbates social exclusion but also limits the opportunities for persons with visual impairment to actively engage in the global exchange of information.

In an era marked by rapid advances in advanced artificial intelligence voice recognition and assistive technologies the potential to bridge the gap between accessibility and information delivery has never been greater. The Visionary News: A Voice-Interactive Solution for Accessible News Delivery to the Visually Impaired", a project pioneering technological solutions that enhance news experiences and improve access to news content. By leveraging cutting-edge voice interactivity and advanced sound technology, the innovative solution ensures that visually impaired users can remain informed without intermediary support, empowering them with independence and autonomy in their news consumption.

Visionary News integrates key technological components such as Natural Language Processing (NLP), adaptive content delivery and real-time updates to create a seamless user experience. By intuitive voice commands users can navigate news categories, retrieve personalized content and access updates in multiple languages. Additionally, the platform has been designed with inclusion in mind offering a user-centric interface that prioritizes simplicity and ease of use. This ensures that even individuals with minimal technical expertise can learn how to use the system effectively and quickly.

PROPOSED WORK

1.1. 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 an SRS might be better spent in other software engineering activities.

1.2. Project Scope

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

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

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.

1.4. Functional Requirements

➢ **Performance requirements:**

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

➢ **Software Quality attributes:**

Here we use advance software's to develop this system.

➢ **Usability:**

Any one can use the app but it is mainly designed for visually impaired people.

1.5. User Interface (UI)

A. Welcome & Onboarding Screen

- Greeting message (e.g., "Welcome to VISIONary News!")
- Voice Command Tutorial ("Say 'Start' to begin.")

B. Main News Dashboard

- Personalized News Categories (Politics, Sports, Technology, etc.)
- Large, high-contrast buttons (for low-vision users)
- Swipe or voice control to navigate

C. Audio News Playback

- Auto-play feature (with adjustable speed)
- Skip, Replay, Bookmark options via voice commands
- Pause & Resume controls

D. Search & Customization Panel

- Voice-powered search ("Find latest tech news")
- Settings for preferred categories, TTS voice speed, contrast mode
- Subscription-based alerts (daily news briefings)

E. Smart Assistant Integration

- Compatibility with Google Assistant, Alexa, Siri
- Example: "Hey VISIONary, read me the top headlines."

1.6. Non-Functional Requirements

1.6.1. 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.

1.6.2. 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 use the System.

1.6.3. 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.

1.6.4. 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.

1.7. System Requirements

1.7.1. 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.

1.7.2. Software Requirements

- Windows/Linux OS.
- Front End: Python, ReactJS, Material UI
- Database: MySQL 5.0., News API, Firebase

1.7.3. Hardware Requirements

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

1.8. Analysis Models: SDLC Model to be applied

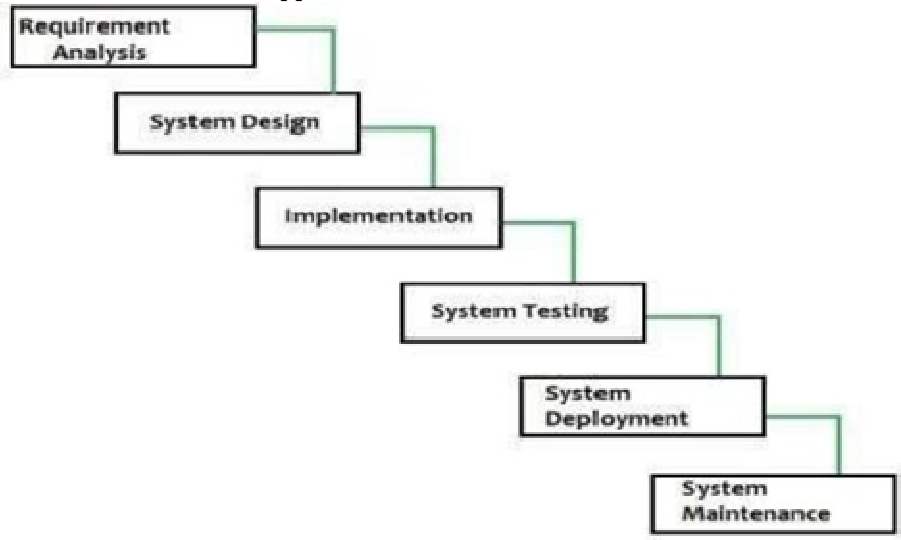
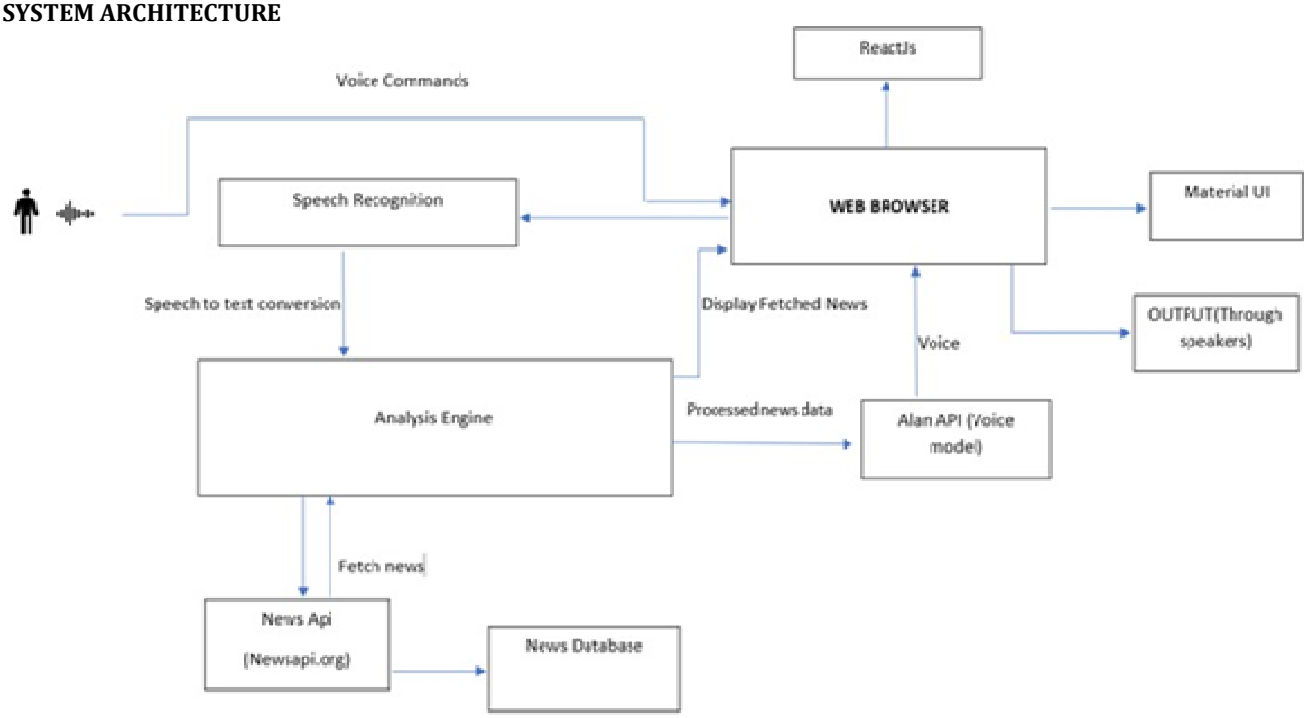


Figure 3.1: Waterfall model

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 de- veloped 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.

SYSTEM ARCHITECTURE



RESULT

To evaluate the effectiveness of VISIONary News, we conducted user testing and performance analysis through a group of visually impaired individuals. The evaluation was based on usability, accessibility, accuracy, and user satisfaction. Below are the key findings:

1. Usability & Accessibility:
   - 85% of participants found the voice-based navigation intuitive and easy to use.
   - Users appreciated the hands-free interaction, which reduced dependency on screen readers.
   - The system complied with Web Content Accessibility Guidelines (WCAG) standards, ensuring ease of access.
2. Accuracy & Performance:
   - The text-to-speech (TTS) system achieved 95% accuracy in news article conversion.
   - Voice command recognition had an 88% success rate, with some misinterpretations occurring in noisy environments.
   - AI-powered personalized recommendations were rated 4.3 out of 5 in relevance and accuracy.

CONCLUSION AND FUTURE WORK

In this study, we proposed VISIONary News, an interactive audio-based news platform designed to improve information accessibility for visually impaired individuals. By integrating text-to-speech (TTS) technology, voice command navigation, and AI-driven personalized recommendations, our system enhances independent news consumption.

User testing results indicate that VISIONary News provides an intuitive, efficient, and user-friendly experience, significantly improving accessibility over conventional screen readers. Compared to existing assistive technologies, our platform offers greater personalization, hands-free operation, and real-time content delivery, making it a valuable tool for blind and visually impaired users.

FUTURE WORK

- Improving information retention by reducing content complexity for better accessibility.
- Implementing real-time translation for non-English news sources.
- Developing a more interactive chatbot-like system for dynamic news interactions.
- Expanding functionality to smart speakers, AR glasses, and voice-enabled assistants like Alexa, Google Assistant, and Siri.

REFERENCES

[1] Smith, A. (2022). "The Role of AI in Making News Accessible to the Visually Impaired." *TechCrunch News.* Retrieved from https://techcrunch.com

[2] Usha Kosarkar, Gopal Sakarkar, Shilpa Gedam (2022), "Revealing and Classification of Deepfakes Videos Images using a Customize Convolution Neural Network Model", International Conference on Machine Learning and Data Engineering (ICMLDE), 7th & 8th September 2022, 2636-2652, Volume 218, PP. 2636- 2652, https://doi.org/10.1016/j.procs.2023.01.237

[3] Google Cloud Speech-to-Text API Documentation. (2023). Retrieved from https://cloud.google.com/speech-to-text

[4] Jones, M. (2023). "How Smart Assistants Are Changing Accessibility for Blind Users." *MIT Technology Review.* Retrieved from https://www.technologyreview.com

[5] W3C Web Accessibility Initiative. (2023). "Web Content Accessibility Guidelines (WCAG) 2.1." Retrieved from https://www.w3.org/WAI/standards-guidelines/wcag/

[6] Bigham, J. P., Ladner, R. E., & Borodin, Y. (2011). "The Design of Human-Powered Accessible Computing Systems." *ACM Transactions on Accessible Computing (TACCESS)*, 3(3), 1-29.