A Concise Review On E-Commerce Website For Visually Impaired

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***Abstract*: E-commerce has revolutionized the way people shop for goods and services, making it easier and more convenient to purchase products from the comfort of their own homes. However, visually impaired individuals face significant challenges in accessing and navigating ecommerce websites due to their reliance on visual cues. This can lead to a frustrating and isolating shopping experience, limiting their ability to make informed purchases and participate in online commerce.**

The purpose of this paper is to explore the challenges faced by visually impaired individuals when using e-commerce websites and to propose a solution to make e-commerce more accessible and inclusive. We aim to develop a voice-controlled e-commerce platform that uses natural language processing and machine learning to create a user-friendly interface for visually impaired users. This solution will enable visually impaired individuals to independently navigate e-commerce websites, browse products, and make purchases with ease.

***Index terms*- Speech Recognition, Natural Language Processing, Voice API, Alan AI**

I. INTRODUCTION

Speech recognition is the process of converting human speech into text that are assigned meaning to some defined actions. As the world continues to transition to a digital environment, it is essential for everyone to keep up with the changes. However, visually impaired individuals have not benefited from technological advancements as much as the general population has. While technologies like screen readers and braille keyboards have made it easier for them to access certain applications, they still face challenges accessing many critical resources and often require third-party assistance. To help address these issues, various web assistive technologies have been developed over the years, such as screen readers, special browsers, and screen magnification techniques. These systems enable users to comprehend web page contents through reading, voice commands, or screen magnification. Incorporating voice-enabled systems into web applications not only provides more options for users but also

enhances the usability of the applications for all users.

As more companies shift their focus to digital platforms, it is crucial to ensure that individuals with disabilities can access these resources with ease. By integrating Speech Recognition Systems (SRS) into web applications, users can navigate and interact with the platform using natural language, making it more convenient and accessible for everyone. However, many existing solutions have limited accuracy due to frequent misinterpretation. Therefore, this paper focuses on creating an e-commerce website based on Alan AI, Voice API, and NLP to improve accessibility for handicapped and visually impaired customers, allowing them to access platform services without relying on others.

II. LITERATURE SURVEY

All the related works that have been done by other researchers that are related to the current research problem are summarized in this section.

1. NLP And Machine Learning For Voice Synthesis

This paper presents a study of the state-of-the-art speech recognition systems and propose a taxonomy of SRS. Mandeep, Farhana, Haruna presented a voice-controlled e-commerce application using IBM Watson speech-to-text service as a part of a comparative study with other speech-to-text systems such as Google and Amazon [1]. IBM Watson speech-to-text service uses advanced NLP and machine learning technologies for voice synthesization and text conversion. They claimed that their web-application takes a voice command, converts it to text, extracts meaning from the text, and then performs a wide variety of tasks including searching, browsing, reading and writing text. The rest of the paper presents a background of the concepts, components, and applications of SRSs.

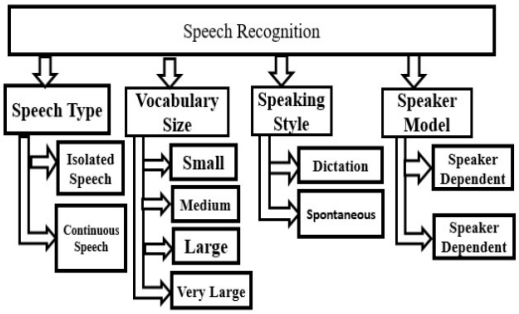

Fig 1:Taxonomy of SRS [1]

2. Artificial Neural Networks (ANNs), and Deep Neural Networks (DNNs)

This paper[3] is all about speech recognition systems and their applications in developing voice-controlled web applications. The authors discuss the existing literature on speech recognition systems and their limitations, as well as the potential for developing more sophisticated systems that can accurately recognize and interpret natural language commands.

The authors discuss the various techniques used in speech recognition, such as Hidden Markov Models (HMMs), Artificial Neural Networks (ANNs), and Deep Neural Networks (DNNs). They also discuss the different approaches to speech recognition, such as the acoustic modeling approach, the language modeling approach, and the hybrid approach.

The paper also discusses the challenges faced in developing voice-controlled web applications for different languages and accents. The authors highlight the

importance of designing speech recognition systems that can handle a variety of accents and dialects, and provide examples of techniques used to improve the accuracy of speech recognition in different languages.

3. Text to Speech and Speech to Text

The hands-free approach provided by the system goes to a great length and makes the user interact more often as the user usually prefers to use voice command rather than giving commands by typing[2]. One of the biggest advantages of the proposed system is that the voice recognition is not limited to just mobile phones, laptops or computers but voice recognition is being installed in all type of devices that users interact with like smart televisions, smart watches etc.

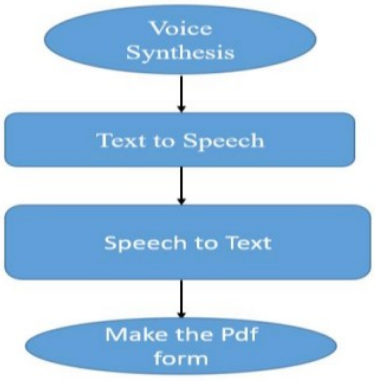

Fig 2: Data Flow Diagram[2].

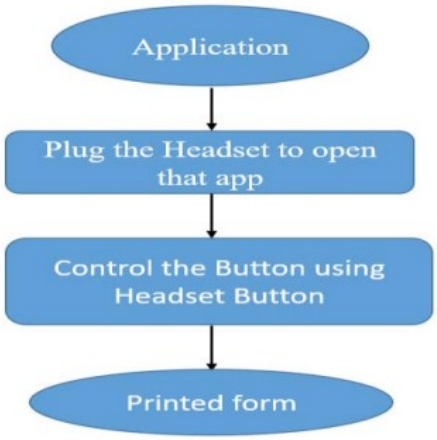

Fig 3:System Flow Diagram[2].

4. Alan AI

The Alan AI is a powerful voice assistant platform that enables developers to add voice-enabled capabilities to their web and mobile applications[4]. The platform is designed to help developers create conversational interfaces using natural language processing (NLP) and machine learning technologies. Alan AI is easy to integrate into existing applications and can be customized to meet the specific needs of individual businesses.

One of the key benefits of Alan AI is its flexibility. The platform supports a wide range of languages and dialects, making it accessible to users from all over the world. It also allows developers to create custom voice commands, which can be used to trigger specific actions or responses within an application. This gives users a more intuitive and personalized experience, which can lead to higher levels of engagement and satisfaction.

Alan AI also includes a powerful analytics dashboard, which provides developers with valuable insights into how users are interacting with their applications. This data can be used to

identify areas for improvement and optimize the user experience over time.

III. COMPARATIVE STUDY

In this section we present a comparison of the methodologies used in each literature surveys.

Comparative study

SL no.	Title	Concept	Authors	Year
1	Voice controlled ecommerce web application	NLP, Cloud based SRS for ecommerce applications	Mndeep Singh Kandhari, Farhana Zulkerine, Haruna Isah	2019
2	Voice Controlled News Web Application with Speech recognition	Use voice and speech as a medium to find and look for at your choice	Aaditya Chaparna, Ranjeet Kumar, Ajay Saini, Akash Kumar	2021
3	Voice Based form filling system for visually challenged people	speech to text and text to speech conversion that is fully operated by voice	S. Usharani, P.M. Bala, R. Balamurugan	2020
4	Alan AI	Alan AI is an end-to-end conversational AI platform for building reliable AI assistants.	Ramu Sunkara, Andrey Ryabov	

In a voice controlled e-commerce web application, the results can be summarized as follows. In terms of quality, Google proved to be superior to the other systems as it was able to identify 73.3% of the text with only 15.8% WER(Word Error Rate) and 73.3% PRR(Phrase Recogniton Rate). Cloud based SRS can be used, but not necessary. Voice API has got some limitations in context of e-commerce applications. JavaScript libraries also will be great use to implement Speech To Text (STT) and Text To Speech (TTS) services. Above all the mentioned techniques, usage of online AI tool such as Alan AI is found to be more convenient to integrate with e-commerce applications.

IV. CONCLUSION

A voice based e-commerce website can provide a convenient and user-friendly experience for the customers. The main focus was on the blind people who cannot use the E-commerce website by their own. The main motivation for development of such a website is the lack of availability of visually impaired friendly e-commerce website. The website has linear navigation through entire website and processes voice output to instruct users about each step and the inputs to be provided so that it is easier for navigation.

By following the best practices and staying up-to-date with the latest technology standards, we could provide a trustworthy voice-based shopping experience for the customers.

In future, we may implement other similar voice-controlled applications.

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