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ONLINE SHOPPING PLATFORM FOR VISION CHALLENGED PEOPLE

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ABSTRACT:

A website design that enables visually impaired and blind users to access and purchase without the aid of someone's assistance. The system provides speech instructions to users and requests input from them. To access different voice messages for various fields, the user must utilize the cursor to hover over the entire page. The procedure is advanced when the user provides input via keyboard keys. The website is built with React JS and its database is hosted on Firebase. As we all know, e-commerce websites are continuously expanding and in high demand for acquiring a variety of goods, both buyers and sellers benefit from the ecommerce platforms' ease of use. However, online retailers place less value on clients who are blind or visually handicapped. This research will examine the numerous facets of e-commerce websites that blind and visually impaired persons use on their own, without assistance, to select and purchase goods. Additionally, it will make it easier for someone who is blind to independently buy items from the e-commerce website. This project will also provide a summary of the ways in which various technologies can enhance the results of earlier research.

Keywords: Text to Speech, Speech to text, Ecommerce website, visually challenged

INTRODUCTION:

E-commerce is an important part of the business world today, but it can be difficult for visually impaired people to use e-commerce sites. This is because many e-commerce sites are not designed to be accessible to visually impaired users. E-commerce sites for visually impaired users will be designed to be accessible to people with various visual impairments, including blindness, vision impairment, and color blindness. The website will use the following features:

High-contrast text and images:

High contrast text and graphics would be used on the website to make it easier for those with low vision to read. In other words, use a light backdrop with dark text or a dark background with light writing. Furthermore, the text ought to be readable in its whole.

Text-to-speech capabilities:

The website would have text-to-speech capabilities so that visually impaired users could hear the text on the page. This would allow them to navigate the website and read the product descriptions without having to see them.

Accessible navigation:

The navigation on the website would be easy to use and would be accessible to users who use screen readers. This means using clear and concise labels for all links and buttons and avoiding using images or icons as the only way to navigate the website.

Descriptive alt text for all images:

All images on the website would have descriptive alt text so that visually impaired users could understand what the images represent. This text should be descriptive enough so that users can understand the purpose of the image, even if they cannot see it.

Additional features:

A visually impaired user would need to examine an e-commerce website for visually impaired users in addition to these elements to make sure it is user-friendly and accessible. This testing would assist in identifying any aspects of the website that want improvement, such as the font size, backdrop and text contrast, or navigation.

Making e-commerce more accessible to everyone would need the creation of a website specifically for visually impaired people. We can ensure that people with visual impairments have equal opportunity to participate in the digital economy by making ecommerce more accessible.

METHODOLOGY:

Web design:

By understanding the need and challenges of visually impaired users and accessibility guidelines and standards such as WCAG 2.1, and ensure that the design adheres to them we have to design the website for easy access and user-friendly modules. Colors should be minimal and high contrast. The card which contains product details and description should be in a classic design and easily readable. There should be more space between cards to ensure more readability of the users.

Front end development:

By adhering to the accessibility guidelines and standards such as WCAG 2.1, we have to develop the frontend of the e commerce webpage with one tap login page which contains google sign in option. The products are showed as cards with product description and product price details. Front end of the web page is done using React JS frame work with CSS, HTML and JS. Product details are retrieved from firebase and fetched to the products page.

Text-to-speech:

Begin by performing user research to learn about the specific needs and preferences of visually impaired people when it comes to TTS. Determine which sorts of content, such as product descriptions, reviews, navigation menus, and user-generated material, require TTS support. Choose a trustworthy and high-quality TTS technology or service that supports the necessary languages and accents. We utilized the react text to speech module in this case.

Speech-to-text:

Begin by performing user research to learn about the specific needs and preferences of visually impaired consumers when it comes to STT. Determine which categories of content, such as product descriptions, reviews, navigation menus, and user-generated material, require STT support. Choose a STT technology or service that is dependable and of good quality, and that supports the relevant languages and accents. We utilized the react speech to text module in this case.

Voice Search filters:

By integrating a speech recognition API into your website to convert spoken words into text. Ensuring that our website has a clean and accessible interface that works well with screen readers and voice commands. Use semantic HTML, ARIA (Accessible-Rich-Internet Applications) roles, and labels to make elements easily navigable. Place a prominent voice search button on your website, making it easily accessible via voice command or keyboard navigation. When the user clicks the voice search button or says a trigger phrase (e.g., "Search for..."), activate the speech recognition feature. Utilize the chosen API to capture and convert the spoken words into text. You can use JavaScript to handle this process on the client-side. Interpret the voice query and convert it into a search query for your e-commerce platform. Ensure that the search query is well-structured and compatible with your website's search engine. Offer a range of filtering options that can be controlled through voice commands. For example, users might say, "Filter by category," "Sort by price," or "Show products with free shipping."

Add to Cart:

Make an eye-catching "Add to Cart" button with clear text. Give audio and written confirmation that the item has been put to the cart. Cart Summary: Include a "Cart" icon or link that takes you to a page that displays the cart's current contents.

Wishlist Button:

Add a "Wishlist" button close to the product description. Create a separate "Wishlist" page where users can manage their stored items. Confirmation Feedback: Provide voice and text feedback verifying the item's addition to the Wishlist.

Payment methods:

Use high-contrast colors and fonts, avoid using small text or images, provide clear labels for all fields, allow users to skip steps in the checkout process, and offer a variety of payment methods, including those that do not require visual verification, to make e-commerce payment methods more accessible to visually impaired people. To guarantee that the payment procedure is simple, test it with visually challenged consumers. By adopting these guidelines, e-commerce companies can make their payment systems more accessible to visually impaired customers and provide a more inclusive purchasing experience for everybody.

Maintenance and updates:

Establish a regular maintenance schedule to ensure the system's reliability and update the model as necessary to adapt to changing waste characteristics. Set up a regular schedule for inspecting and cleaning the cameras and sensors. This will help to ensure that they are operating properly and that they are not contaminated with dust or dirt. Monitor the performance of the React TTS and STT and make adjustments as needed. This could involve finetuning the react TTS library.

SYSTEM DESIGN

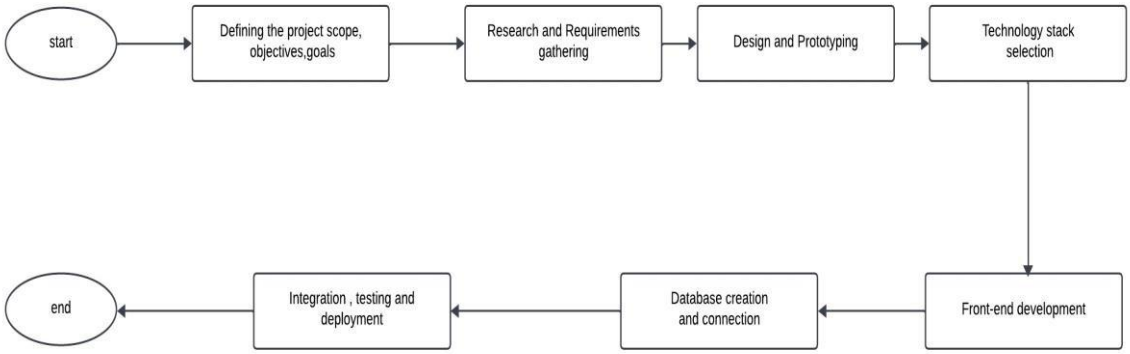

Fig 1 Proposed work plan

CONCLUSION

This project has explored the development of an ecommerce website for visually impaired users. The project has identified the benefits of having an accessible ecommerce website, as well as the challenges involved in creating one. The project has also proposed a number of solutions to these challenges. The project has shown that it is possible to create an ecommerce website that is accessible to visually impaired users. However, it is important to note that there are still some challenges that need to be addressed. These challenges include:

- Lack of awareness
- Technical challenges
- Cost
- Efficient visual identification
- Cost Savings and Operational Efficiency

FUTURE ENHANCEMENT

Improve the accessibility of the website: There is always room for improvement when it comes to accessibility. The website can be further improved by adding more features that make it easier for visually impaired users to use, such as:

- A text-to-speech option that reads the content of the website aloud.
- A zoom feature that allows users to magnify the text and images on the website.
- A keyboard-only navigation system that allows users to navigate the website without using a mouse.
- Add new features and products: The website can be further improved by adding new features and products that are relevant to visually impaired users. For example, the website could add a section for products that are designed for visually impaired users, such as braille keyboards and screen readers.
- Expand the reach of the website: The website can be further improved by expanding its reach to more visually impaired users. This can be done by translating the website into different languages and by promoting the website to visually impaired organizations and communities.
- Gather feedback from visually impaired users: It is important to gather feedback from visually impaired users to ensure that the website is meeting their needs. This feedback can be used to improve the accessibility of the website and to add new features and products that are relevant to visually impaired users.

By considering these ideas, you can continue to improve the ecommerce website for visually impaired users and make it even more accessible and userfriendly.

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