Final Design Documentation

Content

Talkify

Introduction

Talkify is a virtual assistant aimed at bringing voice-activated functionality to Windows, allowing users to interact with their computer through voice commands. With a strong focus on Human-Computer Interaction (HCI) principles, Talkify ensures a seamless and user-friendly experience, making everyday tasks more intuitive and efficient, all through the power of voice control.

Goal:

The primary objective of our project is to create an innovative **Python-based Windows plugin** that leverages voice commands to revolutionize the way individuals interact with their computers. By enabling hands-free control, our plugin aims to enhance accessibility and user experience, particularly for individuals with limited mobility, such as limb-impaired patients. “This technology will facilitate seamless system operations, transforming traditional typing and clicking into effortless voice commands”.

User Benefits:

1. **Enhanced Accessibility:** For limb-impaired patients, the plugin offers a vital means of accessing and controlling their computers, enabling them to perform various tasks without relying on physical inputs.
2. **Seamless Interactions:** By eliminating the need for typing and clicking, the plugin fosters a more natural and intuitive interaction between users and their computers, leading to a more enjoyable computing experience.
3. **Improved Efficiency:** The plugin streamlines computer interactions, allowing users to accomplish tasks more quickly and effortlessly, ultimately boosting productivity.

Scope:

The scope of this project encompasses the design and implementation of a user-friendly software plugin with a primary focus on enhancing accessibility and facilitating seamless interactions for users. The project will involve creating functionalities that enable computer systems to respond to voice-activated commands. With the help of these features, users will be able to use voice input for a variety of tasks, including launching apps, navigating software interfaces and carrying out commands. The project's scope will also include testing and improving the plugin to guarantee reliable operation and wide compatibility with a range of Windows environments.

Impact and Innovation:

Our project goes beyond conventional accessibility solutions by merging technology and innovation. By harnessing the power of voice recognition, we empower users, especially limb-impaired patients, to navigate their computers effortlessly. This initiative aligns with the broader goal of creating an inclusive digital environment, ensuring that technology is not a barrier but a tool that enhances the lives of all users.

Through this project, we aim to make a significant contribution to the field of assistive technology, promoting independence and equal opportunities for individuals with disabilities. Moreover, our innovation holds the potential to inspire future developments, encouraging the integration of voice-controlled systems into various applications, thereby enhancing accessibility and usability across diverse domains.

Target User:

Our target audience encompasses individuals facing physical challenges, specifically **limb-impaired** patients who may find it difficult or impossible to click or type. By catering to this audience, our design aims to provide an inclusive solution, ensuring that technology is accessible and usable for everyone, regardless of their physical abilities.

Constraint:

What are the environmental impact considerations for the product?

The environmental impact of a software application, such as a voice-controlled Windows plugin, is generally less significant. Environmental constraints may include ensuring the system is used in an environment with minimal or no background noise. Furthermore, the plugin cannot be utilized in locations where voice usage is restricted, such as in libraries where speaking aloud is prohibited

Are there any specific cultural or regional preferences we need to consider?

There are no specific cultural or regional preferences to consider, as this application is designed for universal usability. Anyone with basic English-speaking skills can use the application, ensuring inclusivity across diverse cultures and regions.

Materials:

Digital Components: Utilize readily available open-source digital components and software technologies, leveraging free resources to minimize costs.

Accessibility Standards:

Adhere to established accessibility standards such as WCAG, ensuring the plugin is universally usable.

Operational Constraints:

By default, Reserved commands cannot be used for other user purposes.

Voice Recognition Standards:

Follow industry best practices and open-source voice recognition libraries to ensure accurate voice command recognition.

Cost:

As a student, operate within a strict budget constraint, utilizing free and open-source resources available in the market to minimize costs. Ensure no additional expenses are incurred during the development process.

Timeframe:

Complete the entire development lifecycle, including coding, testing, and deployment, within a limited timeframe of 2 months. The project must be finished before the final exams.

Health and Safety:

Ensure the plugin's design does not cause any harm or discomfort to users. Implement user-friendly error handling mechanisms to prevent frustration or confusion during interactions.

Features:

Voice-Controlled Operations:

Talkify shall allow users to execute desired operations simply by voicing commands, providing a hands-free and intuitive interaction experience.

Custom Voice Commands:

Talkify shall allow users to add new voice commands along with the corresponding application path that should be added. This customization empowers users to tailor Talkify to their specific needs.

Instructions Page:

Talkify shall allow users to view instructions from the dedicated instruction section, that include the instructions regarding how to use the system.

Voice Prompt:

Talkify shall allow users to amend the voice prompts and application paths, providing flexibility and control over the customized voice interactions.

Application Path Amendment:

Talkify shall allow users to modify existing voice commands, providing the flexibility to update commands based on evolving needs or preferences.

Principles kept in Mind while creating Figma Prototype and Design:

Golden Rule of Design:

In adhering to the golden rule of design, our team meticulously crafted the user interface of our Figma Design with a keen understanding of the fundamental materials at play: the user and the software. Just as the choice of materials shapes the structure of physical designs, the seamless interaction between humans and computers is pivotal in digital interfaces. Every element, from buttons to navigation menus, was thoughtfully placed and designed, ensuring ease of accessibility and navigation. By comprehensively grasping the capabilities and limitations of both the user and the technology, we orchestrated a user interface that harmonizes with the natural flow of human-computer interaction. Similar to how the arrangement of seats impacts an airplane's safety and structure, our meticulous design approach guarantees a user experience that is intuitive, efficient, and user-friendly, enhancing the overall usability of the Figma platform.

To Err is Human:

In our design approach, we acknowledge that human fallibility is a natural aspect of user interaction. By understanding the propensity for errors, we have meticulously crafted interfaces that not only accommodate but also anticipate human mistakes, ensuring a forgiving user experience that minimizes the likelihood and impact of errors.

Trade off:

Allowing users to add, modify, and personalize voice commands allows for a more tailored user experience. However, this empowerment has a drawback: complexity increases with customization options, potentially leading to a steeper learning curve. Furthermore, accommodating a wide range of user needs and preferences through increased flexibility necessitates detailed user guidance to avoid confusion when configuring custom commands and paths.

User Focus:

As the plugin relies on voice recognition and is designed for individuals with limb impairments, it's highly likely that they may not interact with the plugin screens directly. In such cases, their relatives or friends might assist them in setting up the system. With this consideration in mind, the screens and prototype are crafted to be as simple and intuitive as possible. The goal is to ensure that even a novice user can easily learn and use the system. This approach prioritizes user-

friendliness, making it accessible to both the users and their helpers, enhancing the overall user experience.

Process Oriented Approach

The application should be process oriented. Process-oriented applications focus on the steps and workflows involved in completing a task or process. In the context of our Plugin Talkify, the emphasis should be on the workflow of recognizing and interpreting voice, and the subsequent actions or interactions that result from these voice input. The application's primary goal is to facilitate the process of translating voice signals into meaningful actions on devices and applications.

Conceptual Model

Primary Processes:

- **Voice Input Recognition:** The core process of the system involves recognizing and interpreting voice inputs made by the user.
- **Device Interaction**: Once a voice input is recognized, the system should facilitate interactions with the target device or application.

Design Presentation Rules:

- Provide clear and intuitive audio feedback for recognized voice inputs, ensuring that users understand which voice commands the system recognizes.
- Offer options for customizing voice command interpretations or associating specific voice commands with certain actions.
- Utilize a user-friendly interface that allows users to learn and practice voice commands easily.

Rules for Windows:

- The main interface should be resizable to accommodate various screen sizes and resolutions.
- The system should provide a movable overlay window that shows real-time voice input recognition feedback
- The system should allow the user to perform certain operations based on specific voice inputs.
- The system should enable the user to create custom commands based on specific voice inputs.

Major Displays:

- **Main Interface:** This is where users can customize their voice command profiles, view voice command history, and access settings for the system.
- **Device Interaction:** When a voice command is recognized, users should be able to navigate to the relevant application or device interface, which can be done seamlessly.
- **Settings:** Allow users to customize system preferences, including voice input recognition sensitivity and feedback options.
- **Instruction Screen:** This is where users can access guidance and instructions related to the system's operation.

Navigation Design

Mechanisms Used to Interact with the User:

- **Hamburger Menu:** This is used to offer additional navigation options and access various screens, such as settings.
- **Breadcrumbs:** These are employed to indicate the user's current location within the navigation system.
- **Call to Action Buttons:** These are utilized to initiate voice input listening.

Screen Clarity and Design

Each screen is crafted with keeping in view the clarity, making user interactions with Talkify not only effortless but also natural. We've ensured that every element, from buttons to navigation menus, is designed to provide a seamless user experience. Our approach to labels is to make them not just informative but also meaningful, with clear event names and descriptions that guide users through the software's functionalities.

Interaction Styles:

- **Point-and-Click Interface:** All screens contain buttons, making it a fundamental method for user interaction.
- **Windows:** Error windows have been added to the user interface.
- **Pointers:** A pointer is used to interact with the software and initiate voice input.
- **Icons:** Such as those for instructions, "About Us," and settings, are employed in the interface.
- **Buttons:** Various buttons are utilized, including those for starting and stopping voice input.
- **Toolbar:** A toolbar is implemented within the hamburger menu to provide easy access to functionalities.

Use of Color Scheme

We had used a green and dark green color scheme as it prioritized accessibility and ease of use. Here are some examples of how to use this color scheme:

- **High Contrast:** We had opted for a high contrast color scheme with light text on a dark background. High contrast makes it easier for users with visual impairments to read text and interact with the interface.
- **Minimal color variations:** We limit the use of color to avoid confusion.
- **Considered Color Blindness:** We made the color choices while also keeping in mind users with color blindness. We avoided relying solely on color to convey information and used patterns or labels to differentiate elements.

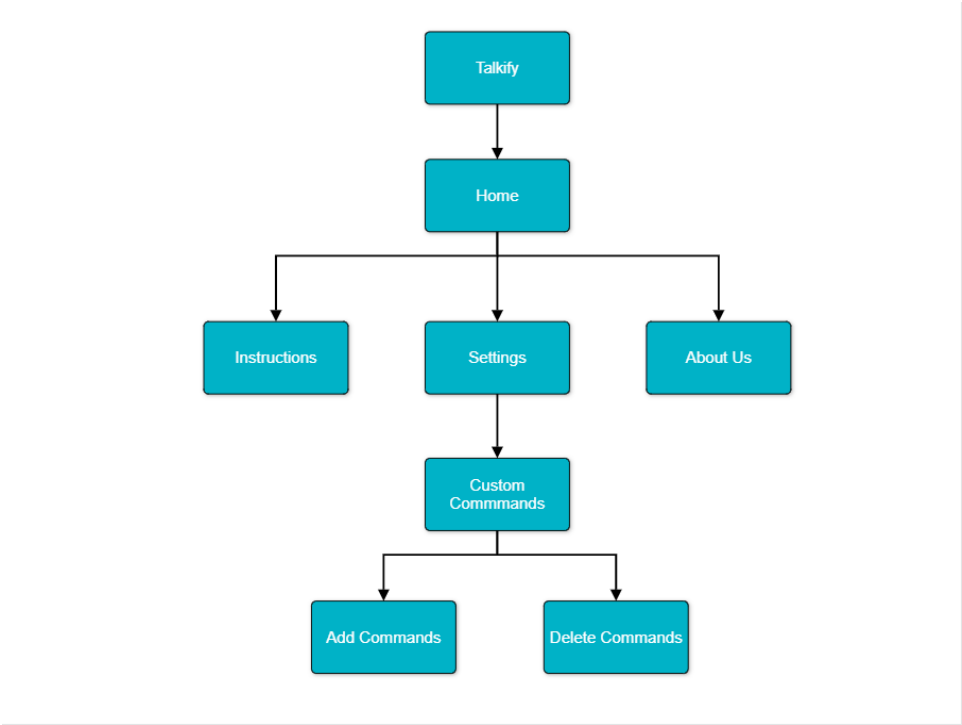
Overview and Link for Figma Design:

For an in-depth look at the high-level final design and prototyping of our project see the link https://www.figma.com/file/X1V4C5n8kIZKhAwBvGGcqO/HCI?type=design&node-id=147%3A306&mode=design&t=fmXAhZ6eGIlSNoQi-1 . This Figma design encapsulates the culmination of our design efforts, providing a detailed visual representation of our user interface and interactive prototyping, ensuring a holistic understanding of the project's user experience.

Norman's 7 stages of Action:

1. **Goal:** The Goal is to make the interaction for a Limb Impaired patient feasible.
2. **Forming the intention:** Using an assistant Like Talkify seems to be a good idea.
3. **Specifying the attention sequence:** Borrow a USB containing talkify from a Friend.
4. **Executing the action:** Install and set up the system for smooth working.
5. **Perceiving the system state:** Request for the task using voice command though talkify.
6. **Interpreting the system state:** Analyzing the task performed by system in response to command.
7. **Evaluating the system state:** Interaction was made feasible using Talkify for a Limb Patient.

Talkify Navigation Hierarchy:



Scenario:

Context and Goal:

Ali, a 20-year-old individual suffering from arthritis, faces difficulty in giving instructions due to his condition. He desires to watch YouTube videos but struggles to do so because of his limited typing ability.

Problem and current process:

Ali, dealing with the challenges of Limb impaired disease, found it difficult to open YouTube and play videos due to his limitations in giving instructions to system. Recognizing his struggle, his brother Hamza took the initiative to assist him. Hamza installed the Talkify plugin and patiently explained how it worked to Ali.

New Process:

After the plugin was installed, Ali felt a sense of relief and happiness. He no longer needed to physically click anything; instead, he could simply voice his commands, making tasks much more accessible. To test it out, Ali confidently commanded, "Play YouTube." The system promptly opened YouTube. With a smile, he then said, "Play a song," and the computer immediately started playing the requested song. This seamless interaction not only made Ali’s experience effortless

but also eliminated any physical fatigue he used to face while trying to navigate the computer. Ali was thrilled to have found a solution that catered to his needs, thanks to the Talkify plugin and his supportive brother, Hamza.

Figma Link:

https://www.figma.com/file/X1V4C5n8kIZKhAwBvGGcqO/HCI?type=design&node-id=147%3A306&mode=design&t=fmXAhZ6eGIlSNoQi-1

The End