# Software Requirements Specification

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**for**

# HawkEye - Visual impairment aid

Software Engineering Project
PEC Chandigarh


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# 1. Introduction

With the world racing towards an era of complete digitalization, a technological advancement that heavily relies on screen-based visual outputs, it is time we notice that a lot of people would not be able to reap the complete benefits of this societal change.

Since web experiences are inherently visual, the web is fraught with sites, tools, and apps that are practically unusable for people with visual impairments. It is a known fact that people need to use the web every day to surf, read and write emails, and to do anything else anyone can conceivably do on the internet. Users with visual impairments should not have to adapt their behavior in order to accomplish their goals effectively. Rather, we need to develop tools that should accommodate the needs of all users, including people with visual impairments.

Over the years there has been considerable development to solve these problems. Screen readers are the most popular tool in this domain, and accessibility tools are adapted according to the potential use of a screen reader. Today, developers are advised to provide text hierarchy, and pictures now need to have descriptive alternative texts that can be interpreted by the screen reader, and websites are structured to ensure they are easily readable and surfable.

The most common problems with the current accessibility tools arise with inaccurate picture descriptions, interpretation and summarization of further links of these links and decision-making while navigating websites.

## 1.1 Purpose

Our project attempts to bridge this gap by helping those with visual impairment access this information in a manner that is convenient to them. Our project encompasses a chrome extension that allows the user to input their form of disability, be it color blindness, hypermetropia, or incomplete visibility. It focuses on improving the readability and navigation of web pages from the perspective of a screen reader.

## 1.2 Product Scope

● Allows users with color blindness to choose their respective category of color blindness and instantly makes respective changes to the webpage in terms of color contrast and visibility to make it better accessible for the user.

● A feature for users to be able to zoom into a particular part of the webpage without increasing the size of the entire webpage, allowing them to clearly read the part they may be hovering over without distorting their view of the entire page.

● Another feature of simply creating a summary of the entire web page and displaying it on a separate tab, where the summary is conveyed to the user through speech synthesis allowing them to access this information in a compact manner without having the hassle of reading the entire text, by simply being able to hear it. The user will have the ability to play, pause, restart and even change the dictation speed according to their convenience.

### 1.3 Future Scope Of The Project

- Extend to more websites other than
- Query search - multiple page output

### 1.4 References

The application has been developed after thorough discussion with the faculty members and teaching assistants.

The following sites and books were referred while making the application:


- https://99designs.com/blog/tips/designers-need-to-understand-color-blindness/
- https://www.freecodecamp.org/news/building-chrome-extension/
- https://www.getfeedback.com/resources/ux/how-to-design-for-color-blindness/
- Fundamentals of Software Engineering, By Rajib Mall


# 2. Overall Description

## 2.1 Product functions

- Improve readability and navigation of the webpage from the perspective of a screen reader.

- Allows users with color blindness to choose their respective category of color blindness and instantly makes respective changes to the webpage in terms of color contrast and visibility to make it better accessible for the user.

- A feature for users to be able to zoom into a particular part of the webpage without increasing the size of the entire webpage, allowing them to clearly read the part they may be hovering over without distorting their view of the entire page.

- Users will be to search the title up by dictation or typing the query which one is interested in and the page opens up along with its summary button.

- Another feature of simply creating a summary of the entire web page and displaying it in a separate tab, where the summary is conveyed to the user through speech synthesis allowing them to access this information in a compact manner without having the hassle of reading the entire text, by simply being able to hear it.

- The user will have the ability to play, pause, restart and even change the dictation speed according to their convenience.

The Product focuses on mainly two classes of people:

- **Color Blind people:**
  - Select the category of colorblindness
- **Hypermetropia/ myopia:**
  - Use the zoom window
  - Move the magnifier to the required position
  - Adjust the zoom extent

## 2.2 Operating environment

This application is web-based and will be used on any System with Internet connection, but here we are using API's to work and facilitate our information.

## 2.3 Design and Implementation Constraints

The software must run on a Web browser with a good internet facility.

## 2.4 Assumptions and Dependencies

Following are the assumptions made while developing the product:

- The user should know the exact class of visual impairment he/she is suffering from.

# 3. Specific Requirements

This section specifies the detailed requirements that the system shall meet.

## 3.1 External Interfaces

### 3.1.1 User Interface

- Visual impairment type menu
- Color Blindness type menu
- Magnifier for hypermetropia/myopia
- Voice recognition search bar
- Summary button
- Play, pause, restart key
- Speed of dictation

### 3.1.2 Hardware Interfaces

- Internet connection on client and server side

### 3.1.3 Software Interfaces

- Any operating system for web browser interface

# 4. Functional Requirements

- A menu to select type of visual impairment.

- Users with color blindness choose their respective category of color blindness and instantly makes respective changes to the webpage in terms of color contrast and visibility to make it better accessible for the user.
- Magnifying the window to zoom in at a particular section of the page without increasing the size of the entire webpage and distorting the view of the entire page.

- Zoom magnitude control.

- Title query search by dictation or typing.

- Find page with title matching the query and show a Summary button

- Creating a brief but conclusive summary of the entire web page and displaying it on a separate tab.

- Summary conveyed to the user through speech synthesis.

- Play , pause, restart and even change the dictation speed according to their convenience.

- Feedback - The system should be flexible enough to accommodate evolving data, and change descriptions for the website with time

# 5. NONFUNCTIONAL REQUIREMENTS

## 5.1 PERFORMANCE REQUIREMENTS

The performance requirements identified as follows:

- Chrome version required **101.0.12** or later
- Need at least 2.5mbps Internet connection
- The system should provide an appropriate level of performance, the elapsed time between site loading and summary creation should be minimal.

## 5.2 SOFTWARE QUALITY ATTRIBUTES

- AVAILABILITY
- CORRECTNESS
- FAST
- MAINTAINABILITY
- USABILITY: The system should be usable by non-experts

## 5.3 SECURITY & SAFETY REQUIREMENTS

Since it's a chrome extension, the authorisation and authentication is handled by the browser itself.

## 5.4 INSTILL CONFIDENCE

The system shall make the user confident about the reliability of the summary from the System.