Calm Eye - Eye Strain Manager for Office Workers

Project Proposal and Feasibility Report

CP317 Spring 2020

Project ID: **CP317-TP05**

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Client Info and Problem

The client is the head of a department at Manulife. During tax seasons, his team experiences prolonged exposure to websites with bright colors which causes eye fatigue and reduces their performance. He suspects the imminent layoffs following the Covid-19 lock-down will put even more stress on his team. He wants a tool that can change the colors of websites to manage eye strain for his employees. He wants the tool to be easy-to-use since his department consists of older adults who are not familiar with new technology. He also asks for a functional beta as soon as possible for immediate use this tax season. Our goal is to implement a Chrome-based extension that manages websites’ colors, brightness, to keep track of exposure time of users.This problem applies to more people than just the employees working at Manulife and applies to everyone who uses a computer, however, since we’ve been hired by the head of the department, our goal is to build an application that they can use, with the choice of making this open-source up to the client.

Task and Preliminary Requirements Analysis

The client wants to browse the website more comfortably during the working period to improve user experience and maintain a good mental state. Customers want to turn their interface into a dark / eye protected mode. The team's work includes building the Google Chrome extension and developing the UI customization menu. The Google Chrome extension allows users to choose the appropriate color (night / dark / blue light filtering mode) for the page background and whether to turn it on or off. The UI customization menu allows users to modify the tools in the Google Chrome extension. There will be a timer in the corner to show the user how long it will be used. Users can choose to turn on the screen filter display automatically in a specific time period.

Suggested Deliverables

The primary component to this project will be a Google Chrome extension add-on, capable of effectively scanning each page load for textual elements that can be colour-modified. This primary component should:

1. Intelligently scan page elements during a page load or page element change.
2. Determine page elements that contain the following criteria:
   1. Header and footer components
   2. Site controls (sign-in/user buttons, contextual menus, buttons and interactive elements)
   3. Empty/dead space elements; unused areas on the screen that typically display as a blank white area (or another colour).
3. Select page elements from the determined set that should be colour-altered to present an alternative experience for the user.

In addition, a user-facing interface will be designed for modification of add-on settings. This UI should contain:

1. The product logo
2. An On/Off toggle, such as Light or Dark.
3. Customization options for colour; users should be able to pick a colour they wish to change to, not limited to black or the web page’s normal colour.
4. Sensitivity options, such as transparency and levels of colour/page element differentiation.
5. Custom page element specifications; enables the user to further customize and diagnose any page element issues upon modification (similar to popular extensions like AdBlock, where the user can walk through a process of blocking a specific ad that may have been missed or improperly rendered).
6. Page exemptions and customizability; users should be able to specify websites/specific site pages where the extension will not run or make any modifications.

Following agile methodology principles, we will provide several iterations of the above software product, and will complete development/testing in multiple sprints, with documentation and communication being provided through each iteration, as highlighted in more detail below. Finally, a detailed documentation will be provided on how to use and troubleshoot the product.

Process to be Followed

The team has decided to follow the Agile approach that involves beginning with a user interface mockup and gradually adding functionality until all of the client’s requirements are met. The approach was chosen under the following considerations:

* 1. The client is unclear of their requirements. New features need to be planned quickly and deployed or rollbacked based on feedback.
  2. Due to the limited scope, new features would only require days, if not hours to deploy or rollback. Changes in the product would not cause sudden stand stills.
  3. Useful software is continuously delivered. By using an iterative method, the team can quickly develop prototypes for the client to evaluate.
  4. The user interface is required to be intuitive and simplistic in order to satisfy older employees who are not too familiar with technology.

Below is a brief description of the agile process, specifically scrum, which is highly used throughout the industry.

* + A core component of agile development are user stories to communicate the desired result from a user perspective to keep focus and promote creativity. For this project, we have the following user story.
    1. As an employee at Manulife who spends the majority of the work-week on the computer, I want colour-modified display options so that I can decrease the strain on my eyes.
  + The first step of this process is to create a product backlog containing each requirement needed by the client/product owner. The requirements list is presented to the developer team where the deliverables of the product can be established and agreed upon.
  + The team then creates a scrum(plan) consisting of a series of iterations also known as sprints planned at the start of the project; however, the plan is a guideline and is modified accordingly during sprints. Each sprint has its dedicated deliverables, start, and end dates and will include planning, implementation, review and retrospect. A sprint will also entail periodic meetings with the development team, usually daily, as a checkpoint to review and discuss roadblocks along the way. Once a sprint is completed, a software update is provided to the client and client feedback is received.
  + Once all sprints are complete and the client is satisfied with the product, the product can be delivered to the client.

Below is the proposed outline of the iteration stages and milestones including what the team expects to have completed at each stage.

Process Outline

At every milestone, the latest version of the software will be delivered to the client, and feedback will be collected. Each feedback will be used to build the requirements for each iteration.

Iteration 1:

Create a general UI.

Add time-reading and scheduling capabilities. Add brightness detecting ability. Link them to UI

Create a function that changes screen color to amber-tint and reduces brightness according to surrounding light. Link this function with UI.

Iteration 2:

Backlog: Collect feedback from the client. Requirements are made.

Add color-scanning capabilities to map colors of areas of a website.

Create a theme which includes background and text colors.

Create a function that changes a website’s color to the theme. Link this function with UI.

Bug fixes

Iteration 3:

Backlog: Collect feedback from the client. Requirements are made.

Create 1 more theme. Change themes’ behaviours to take into account cases where a website texts’ color is not black.

Create a local database that allows the user to save which website to which settings.

Bug fixes

Iteration 4:

Backlog: Collect feedback from the client. Requirements are made.

Bug fixes.

Communications

We will be keeping in touch with the client via emails, conference calls and if necessary, client-site visits. The client will be notified when each phase of the object has been completed and after bug testing on the extension has become satisfactory. To inform the client of our implementation plans of their ideas and requirements, we will also be providing them with images and documents of our completed work, as well as execution logs. During the implementation phase, we will send them updates regarding the project through screenshots of the product as it develops. As for communicating among our team, we will be using Facebook Messenger as it supports sending links, photos and hosting conference calls. We also plan on having at least one Zoom meeting per week in order to further work on the project.

Business Considerations

There are several business considerations that should be considered going forward; especially with respect to the size of the program and what information will be stored.

*Sensitive information*

The Google Chrome extension function is developed based on browsing websites, customers will leave page addresses and history records. This is user's private information, which may be sensitive and must be strictly guarded by security measures. In this case, the UI customization menu will set up a password protected page to prevent malicious users from accessing and obtaining private information.

*Ownership*

The team consists of seven members who will work on the project for this semester and are the owners of the software. Once the product is delivered to the client, a limited ownership will be given and the client is allowed to make modifications. The agreement will not include any maintenance nor updates from the team after the product is delivered and approved by the client.

Risk Analysis:

To realize business benefits and reduce the risk of unexpected delays, costs and value erosion, the following risks have been identified and mitigations have been suggested to ensure the value and quality of deliverables.

1. *Project Out of Scope*

The scope of the project may not be viable, aligned with objectives or create a scope creep (uncontrolled, continuous increase in project’s scope). To avoid this risk, the team must communicate with the client to clarify scope translating any technical jargon to a logical business context. With this in mind, the team must also discuss with the client to understand their expectations and together define the outcomes of the project, re-estimate budgets and plan completion dates. Any changes and approvals from the client must have written documentation such as emails.

1. *Delayed Completion*

With a limited time-frame of three months, there is a possibility that the product may be completed later than proposed. To begin with, we must practice good time management skills allocating sufficient time to complete the project. By employing agile development, Post-implementation reviews are held after each development cycle to examine the client's response to the latest sprint.. In addition, there will be periodic meetings regarding the software, the client will be aware of delays and setbacks the team may be facing. To minimize the risks associated with a delayed completion, it is critical for the team and client to communicate effectively to decide whether the product is to be delivered once fully completed or deliver a semi-functional product with incremental updates. This factor can be measured with percent of expected benefits achieved, and percent of sub-programs in the project delivered on time.

1. *Unfeasible Requirements*

Once development begins, there may be requirements that are undoable; for example, a feature that could not be supported on the platform (Google Chrome). This may be an unlikely scenario, however, it is always helpful to plan in case this situation occurs. In such a scenario, we must discuss with the client if the requirement is necessary; if so, we may draft up a similar alternate requirement and if it is not necessary, the requirement can be removed. All changes must be accounted formally with written approvals.

1. *Insufficient Testing*

It is important to allocate sufficient time to test in order to minimize errors reported by the client and to avoid delivering faulty software. Since we have adopted an agile process development, each sprint will include testing of the new implementations and the software as a whole. Increment testing will allow there to be sufficient testing to be completed over the development of the software.

1. *Lack of Effective Communication*

Communication is vital to a successful project as it ensures client satisfaction and reduces unnecessary workload. A lack of effective communication can lead to compromised requirements, dissatisfactory clients, and additional work for the team. Therefore, discussion within the team and between the client and team should be periodically scheduled to discuss progress to reduce any risk associated with ineffective communication. A team member with strong relationship-building skills will be assigned to handle communication with the client.

1. *Lack of Resources*

Since we have limited resources, we must complete the project with the team members and the hardware we have. We cannot acquire the help of others nor more resources. To avoid the team facing a problem like such, it is important to define project requirements and specifications within scope which is feasible for the hours of effort we have. Moreover, required skills and resources must be clearly defined by the team where accountabilities need to be specified and distributed based on the abilities and availability of members.

Technical Requirements

Technical requirements are functions and attributes that must be considered in order to successfully complete a project. These are aspects such as performance and reliability, they refer to how the software is built. Some of the requirements include:

1. *Capable of reading and writing HTML documents*

Users must allow access for the extension to change website HTML data into their desired preferences. Selecting correct HTML elements and adjusting their values.

1. *Compatibility of users*

The Google Chrome extension should be able keep track of preferences for different individual accounts.

1. *Centralized database to keep track of user information*

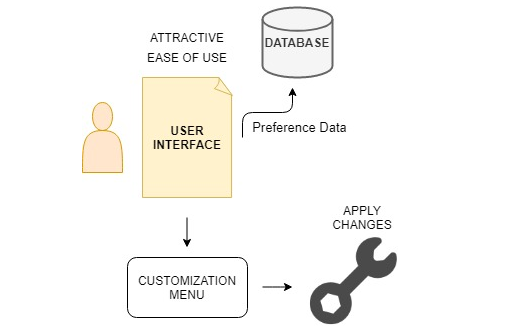
A database should be used in order to remember and coordinate user data. Including themes, transparency, or amount of screen time.

1. *Clear and concise UI*

Users should be able to easily identify and apply changes to their browser without any problems. This includes a customization menu to change preferences of individual Chrome appearance, On/Off Option, and page exemptions.

1. *Security and Safety*

Security measures must be maintained so that user information will not be used for malicious intent. Must also follow schemas, ensure constraints and preferably create a back up.



In the given figure above, the users are only capable of accessing and changing their preferences through our UI customization menu. Hidden from users, there will be a centralized database to store user data and settings. This database would preferably be in SQL. Since it is an extension to Google Chrome, the implementation would be in JavaScript with CSS and HTML.

Work Done by Each Team Member

**Shou Nakano:** Client Info/Problem, Communications, Survey Declaration, Formatting

**Connor Hagen:** Suggested Deliverables

**Daniel Kwan:** Technical Requirements

**Vinuyaa Siva:** Business Considerations, Process to be Followed, Risk Analysis

**Hai Phan Thanh:** Process to be Followed, Process Outline

**Yuki Chen:** Tasks and Preliminary Requirements Analysis, Business Considerations

Survey Declaration

* We have submitted Survey 1 and have done an equal amount of work in this project proposal.