CS5760 - Human Computer Interaction & Usability Testing

Spring 2023

Programming Analogies

Heuristic Evaluation

Application name: Programming Analogies

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Development Team:

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Undergraduate Application Description and Design

Description:

- The Programming Analogies app will store computing concept analogies. Computer science instructors/professors/teachers will be able to search, add, and view the analogies to find new ways to communicate challenging topics to their students. Instructors will also be able to create new analogies for use in their courses/classes. Similarly, TAs will utilize these analogies in their own teaching.

Design:

- The first page or otherwise known as the Browsing Page of the application includes a list of Misconceptions, Desired Knowledge, and Popularity in a columnar format.
- The Analogy page includes the analogy the user has created.
- The Analogy Comparison Page includes the Misconception, Desired Knowledge, Programming(and some subset of inputs), and comparison of two analogies side by side.
- Create Analogy Page will allow the user to fill in respective inputs for Analogy Context, Target Domain, Source Domain, and Common Elements.
- Signup and Login pages will include input fields for the user to create an account and log in (if registered with the app) respectively.
- User Info Page includes basic information about the logged-in user and the analogies the user has created.

User Interface (UI) Domain and Description

This app will fall within the UI domain of web applications for knowledge transfer through a medium. The UI will display a list of computing concept analogies ordered by popularity to the user. Furthermore, the user can create an account, add, view, search, and compare analogies.

Heuristic Usability Principles

Visibility of app status:
The users will be given appropriate responses from the application based on their inputs.

Match between system and real world:
The users are comfortable interacting with the application since language, words, phrases, and other information are in proper logical order.

User control and freedom:
The user is able to retract or revert back to the front page or the initial state of the application if they make a mistake.

Constancy and standardization:
The users are taken to the desired page or presented with the right result or information by the application since the actions of the application are defined and consistent.

Error prevention:
The users are presented with confirmation prompts before committing to an action.

Recognition rather than recall:
The users are able to see the instructions to navigate through the application properly.

Flexibility and efficiency of use:
The users who are unfamiliar and familiar with the application are interacting with it in a seamless manner.

Aesthetics and minimalist design:
The users are presented with clean, relevant, less complicated, and straightforward information.

Help users recognize, diagnose, and recover from errors:
The users if they make a mistake are presented with correct error messages.

Help and documentation:
The users are able to search for information about the application and instructions to use the functionalities of the application.

Potential Usability Problems

Visibility of app status:

- The user would not be able to navigate back to the initial state/home page of the application since it is unclear which page currently is the home/startup page of the application. This violates the visibility of the app status principle.

User control and freedom:

- The users of the application will have a hard time understanding the features, functionality, and set of steps to carry out the desired action and hence will make a lot of mistakes while interacting with the application. This violates the user control and freedom principle.

Constancy and standardization:

- Since the home page is not defined and the startup page of the application after logging in or creating an account is also unclear. This violates the constancy and standardization principle.
- The navigation bar is common to all pages of the application which highlights the inconsistency. This violates the constancy and standards principle.

- The buttons on the UIs are not standard in size and format. This violates the constancy and standards principle.

Error prevention:

- The users are not being prompted whether they have the access to create an analogy on the Create Analogy page. This violates the error prevention principle.

Recognition rather than recall:

- Since the home page is not defined and the startup page of the application after logging in or creating an account is also unclear. Moreover, the flow of the application is also not established. This violates the constancy and standards principle.

Flexibility and efficiency of use:

- The users would not be able to navigate back to the initial state/home page of the application since it is unclear which page currently is the home/startup page of the application. This violates the flexibility and efficiency of use principle.
- New users are unclear about the features on the Browsing Page, especially the Search feature. The user is expected to remember the analogy(if they have created any) and search for the same either through a keyword that is present in the analogy on the Browsing Page of the application. This violates the flexibility and efficiency of use principle.

Aesthetics and minimalist design:

- The users would not be able to distinguish between analogies and comprehend the analogies presented on the Analogy Comparison page as the design is not neat. This violates the aesthetic and minimalist design principle.
- The buttons on the UIs are not standard in design, and color. This violates the aesthetics and minimalist design principle.

Help users recognize, diagnose, and recover from errors:

- The Create Analogy, SignUp, and Login page does not specify the required inputs and also does not specify the format of the inputs. This violates the help users recognize, diagnose, and recover from errors principle.

Help and documentation:

- The users of the application will have a hard time understanding the features, functionality, and set of steps to carry out the desired action. This could violate the help and documentation principle.

Critical Usability Concerns

Login/User information/Create Analogy:

- The application fails to establish that the logged-in user is an administrator, student, or instructor/professor/teacher (since students are not allowed to create analogies) before proceeding to create an analogy on the Create Analogy page.

Login/User Info:

- No functionality is provided if the user wants to change the password, basically, the Login page lacks a Forget Password option. Since if a user forgets the password it will be almost impossible to log back in.

Create Analogy:

- The Create Analogy page has a lot of input fields. These fields are not described or defined for the user to go ahead and input any information.
- The Create Analogy page has no option to revert back to the original state, basically, the page lacks clear input contents, and cancel the analogy creation feature.

Critical Usability Scenarios

- Meg creates an analogy but later realizes that the analogy does not match the concept well and she is concerned that the students might not be able to grasp the concepts based on that analogy. Hence, she wants to delete the analogy and she was also looking for an option to Undo/Edit the created analogy as she wanted to modify it.
- Lois logs in to the application and wants to change her password. Lois is unable to find her profile just by browsing the UI, but she realizes that she can access her user profile by clicking on her "username" in the top right corner. However, on the "User Info" page, Lois is unable to change her password and is unable to alter any of her information.
- Stewie visits the application to assist him with some independent studying and erroneously assumes that he has to sign up for an account in order to use the application. On the "Sign Up" tab, he recalls that the person who told him about the app indicated he didn't need an account to use it. However, Stewie can not find a way to reverse the creation of his account.