Dark Mode Report:

A/B Dark Vs Light Mode Testing

Mini Project 5: SafeHealth App

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Date: 10/26/2022

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Executive Summary

This user experience testing consisted of performing informal interviews and think-aloud protocols on two user groups in order to determine if users prefer a light or dark mode version of the app and if there is a design that helps them complete tasks more easily.

A total of six (N=6) participants were interviewed for this research. Three participants were selected to test the light mode and the other three users were tested using the app's dark mode. The participants were asked to complete four (4) varying tasks within the application. While completing the tasks, the participants were timed, their errors were counted, and a success/failure rate was determined. The participants were then asked a series of questions regarding the design, navigation, usability, and their light/dark mode preferences. The following results and recommendations are derived from the analysis of the results of those interviews and user testing data.

Users & Methods

Users

Our usability test consisted of six (N=6) participants. We had three (3) participants test using the light mode version of the SafeHealth app, and three (3) participants test using the dark mode version of the SafeHealth app. All participants had no familiarity with the SafeHealth app prior to the initial usability test conducted.

- **Demographics*:*** As for the demographic information, the dark mode consisted of two males and one female within the age range of 19-40. Their race/ethnicity were one black participant and two white participants . The light mode consisted of two females and one male within the age range of 24-60. Their race/ethnicity were two white participants and one white/asian participant. From the dark mode participants, 3/3 preferred dark mode in their life compared to the light mode participants which 2/3 preferred dark mode. 2/3 of the dark mode participants had a visual impairment while 1/3 of the light mode participants had a visual impairment.

User Goals

Following the interview questions, the participants were tested based on these **user tasks**:

- Know how to sign into the SafeHealth app based on their user preferences
- Follow the appointment creation process in the SafeHealth app

- Know how to navigate the app through all elements
    - Hamburger menu
    - Home button
    - Back button
- Know how to log out of the app

Interview Goals

- Collect, compare, and analyze dark and light mode user stylistic preferences of the app.
- Collect, compare, and analyze dark and light mode user behaviors and efficiencies while using the app.
- Understand and empathize with light and dark mode users' preferences/behaviors while using the app.
- Ensure that accessibility is available in both light and dark modes for users of ranging abilities based on collected data.
- Refine the stylistic elements of the app from user feedback for dark and light modes.
- Understand if there is a need/want for a dark vs light mode feature for this app.
- Understand the unique background and abilities of the users.
- Understand the users' current usage of dark and light mode features in apps/devices.

Methods

We used a mixed methods approach including interviews, think-aloud task protocols, and task analysis.

- **Interviews:** Participants were asked questions about their demographic information, dark mode usage, and visual impairments. Users had both a pre and post set of questions:
    - ***Pre-Simulation:*** Included open-ended questions about users' initial opinions about the app's visual appeal
    - ***Post-Assessment***: Included quantitative and qualitative open and close-ended questions about the visual appeal and navigation ease of the app
- **Think-Aloud Protocol:** Users were asked to complete four tasks in the SafeHealth app:
    - Schedule an appointment with a doctor
    - Navigate to the home page from the appointment page
    - Locate the two-factor authentication setting
    - Log Out
- **Task Analysis:** Assessments were conducted before, during, and after the users interacted with the simulation.
    - ***Performance Metrics***: Quantitatively measured users' time on task, error count, and success/failure of tasks.

The following trends and recommendations are analysis of the qualitative and quantitative data recording through the use of interviews, the think-aloud protocol, and task analysis.

Trends

User Preferences

This study indicates that users prefer dark mode on the SafeHealth app due to user indications of their dark mode usage rates and average ratings for the app's visual appeal and navigation ease.

- **Daily Dark Mode Usage:** The dark mode participants used dark mode features on their phones more than the light mode users on a daily basis. Users were asked "How often do you use dark mode features on your phone/specific apps on your phone?" They were given the options of Always, Sometimes, or Never.
    - ***Light Mode:*** Always = 1; Sometimes = 1; Never = 1
    - ***Dark Mode:*** Always = 2; Sometimes = 1; Never = 0
- **Visual Appeal Rating:** The dark mode participants rated the visual appeal of the app higher than the light mode participants. The users rated the visual appeal on a scale of 1-10, with 10 being the highest.
    - ***Light Mode:*** 8
    - ***Dark Mode:*** 9.1
- **Navigation Ease Rating:** The dark mode participants rated the app's navigation ease higher than the light mode participants. The users rated the navigation ease on a scale of 1-10, with 10 being the highest.
    - ***Light Mode:*** 9
    - ***Dark Mode:*** 9.3

User Behavior

This study indicates that users are able to more accurately navigate the SafeHealth app in the dark mode, but take longer to do so compared to using the light version of the app. These conclusions are based on performance metrics including the average time on task, average errors made, and the success or failure of task completion.

- **Time on Task:** The light mode participants took an average of 1 minute and 3 seconds to complete the tasks. The dark mode users took an average of 2 minutes and 1 second to complete the tasks.
- **Errors:** The light mode users had an average error rate of 3.3 while the dark mode participants had a rate of 2.3.
- **Success/Failure:** All participants, both light and dark mode, had a 100% success rate.

Figure 1: Light Mode Performance Metrics

Metric	**User**		
	1	**2**	**3**
Time on Task	2m 3s	20s	42s
Errors	0	5	5
Success/Failure	Success	Success	Success

Figure 2: Dark Mode Performance Metrics

Metric	User		
	1	**2**	**3**
Time on Task	1m 45s	1m 50s	2m 27s
Errors	0	3	4
Success/Failure	Success	Success	Success

Recommendations

The testing ultimately led to the recommendation that the dark mode version should be the default version instead of the light version. However, users should be able to still choose the light version if they wish. Therefore, the dark mode should be the default mode, but have the option to toggle to light mode in the settings of the app.

This recommendation is supported by three significant trends in the research:

- Users were able to complete tasks on the app with more accuracy in the dark version. Dark mode users only had an average of 2.3 errors when completing the simulation tasks while light mode users had an average of 3.3 errors. Therefore, it can be concluded that the dark version of the app yields easier navigation.
- A large portion of users indicated that they already use dark mode on their device on a daily basis. Half of all users reported always using dark mode on their devices. Therefore, it would make sense to make dark mode the default option due to its established usage in participants.
- Users indicated a higher rating of visual appeal for the dark mode over the light mode. While the light mode had an average rating of 8/10,

dark mode had a 9.1/10 rating. This suggests users prefer the visual appeal of dark mode over light mode.