Grommet Theme Designer

M5: Evaluation

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Project Overview

The Grommet Theme Designer is a web-based application which enables designers, the primary stakeholders, to create themes for websites and web-based applications. Themes created with the Grommet Theme Designer will cover the spectrum of web design needs, including colors, fonts, element style (button, checkbox, etc.), and icon style (line width and end caps).

The theme designer will ensure the theme meets accessibility standards with notifications of inadequate contrast between colors for users with color deficiency (WCAG 2008). This is a significant capability because according to Dix (2004), approximately 8% of males and 1% of females suffer from colorblindness. These figures do not include users who rely on assistive technologies such as screen readers. The importance of this capability cannot be understated as *none* of the designers initially interviewed for this project had taken accessibility into account when designing themes.

When the designer is satisfied with the theme, it can be imported into Sketch. A new Sketch plugin will customize the Grommet Sticker Sheet with the theme's settings, which makes it easy for designers to begin designing their website or application.

Finally, the theme designer streamlines the handoff to developers by providing developers with the customized theme for the Grommet (http://grommet.io) web development library. This enables developers to efficiently implement the application as designed.

Users

The **primary stakeholders** of the Grommet Theme Designer are designers who create themes for websites and applications. For the scope of this project, this user group will be further subdivided into designers who use the OS X operating system and the Sketch design tool. The initial survey indicated 60% of the primary stakeholders use OS X as their primary operating system.

Primary stakeholders will generally have formal training in graphic design, web development, or a related field. Those surveyed described their occupation as either "Software and web development" or "Arts, design, and user experience" as shown in Figure 1.
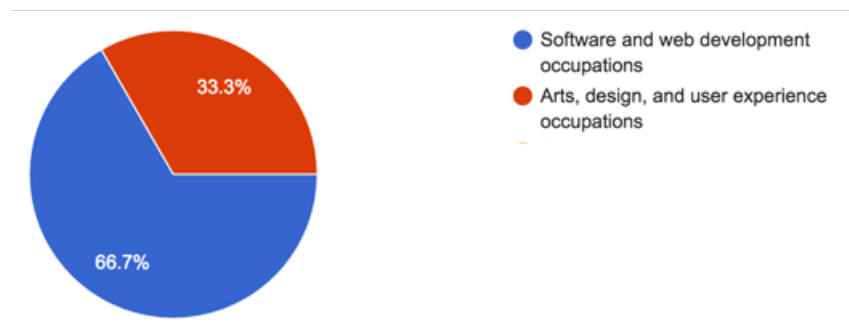

Figure 1. Occupations of designers (n=6)

The **secondary stakeholders** of this system are website and application developers who receive the theme output by the system.

There are two groups of **tertiary stakeholders** of this system who have no direct involvement with the project but will be affected by its outcome. The first are employers who have designers on staff who create custom themes as part of their job responsibilities. The second group of tertiary stakeholders is the users of websites and applications designed with the theme designer.

User Stories
The following user stories describe the capabilities which will be offered by the Grommet Theme Designer.

I. Foundation
   a. As a designer, I need to efficiently create a theme for a web application.
   b. As a designer, I need to preview a sample application using my theme.
   c. As a designer, I need to share my theme with stakeholders and developers.
   d. As a designer, I need to download my theme for use in Sketch.
   e. As a developer, I need to preview the theme and provide feedback to the designer.
   f. As a developer, I need to download the theme for use in the Grommet application development platform.

II. Color
   a. As a designer, I need a primary color to be suggested.
   b. As a designer, I need to specify a primary color based on my customer's brand.
   c. As a designer, I need to fine-tune suggested primary and secondary colors.
   d. As a designer, I want to be notified when colors lack differentiation by users with color deficient vision.
   e. As a designer, I want to be notified when colors lack adequate contrast to meet accessibility standards when text is placed on top of colors in my palette (e.g. in buttons).

III. Fonts
   a. As a designer, I need to select a font family.
   b. As a designer, I need to browse fonts for use in my application.
   c. As a designer, I need to preview and fine tune the typographic scale.

IV. Element style
   a. As a designer, I need to adjust the corner radius of buttons and controls.
   b. As a designer, I need to set the line weight within icons.
   c. As a designer, I need to set the end cap within icons.

V. Design tool
   a. As a designer, I need to import my theme into Sketch so I can design my application using my theme without manual entry of my theme settings.

Evaluation Methods

A formative research experiment was performed to test the hypothesis:

The Grommet Theme Designer will be easy to use, provide high user satisfaction, and will increase the likelihood of themes being accessible.

To test this hypothesis, six users from the primary stakeholder group were selected. Five of the test subjects are colleagues of the author and remaining test subject is employed by another company. The script in

Appendix A: Script was used to ensure consistent moderation of the experiment for all test subjects.

Before starting the experiment, participants were asked to review and agree to the consent document in *Appendix B: Consent Document.* The experiment was then performed in four stages. First, test subjects completed an initial online survey. Second, test subjects were allowed to practice using the prototype interface for 60 seconds. Third, test subjects completed a set of tasks using the online prototype. Finally, test subjects completed a concluding online survey.   Sessions were 30 minutes in length.

Tasks

Users were asked to perform a single task, which was to create a theme for a website or web application. Under the primary task, the following sub-tasks were expected to be performed using the online prototype of the Grommet Theme Designer. If any of the sub-tasks were not naturally covered by the test subject, they were prompted to complete them.

A. Color
   a. Select the desired primary color. (User stories II.a., II.b., and II.c.)
   b. Simulate various types of colorblindness. (User stories II.d. and II.e.)
B. Fonts
   a. Adjust the font in the theme. (User stories III.a. and III.b.)
C. Element Style
   a. Adjust the style of buttons, checkboxes, etc. (User story IV.a.)
   b. Adjust the visual appearance of icons. (User stories IV.b. and IV.c.)
D. Review and Sharing
   a. While working on your theme, would you ever want to preview your theme? If so, how would you do that? (User story I.b.)
   b. Now you'd like to review your theme with clients, colleagues and developers. How would you share your theme? (User story I.c.)
   c. Now you'd like to download your theme. How would you accomplish this? (User story I.d.)
E. Design tool
   a. Import the theme into Sketch. (User story V.a.)

Survey Questions

Test subjects were given two surveys during the experiment. The surveys were completed electronically using Google Forms. The initial survey was given to subjects at the beginning of the session. It consisted of seven questions, with six of the seven questions requiring a response. The seventh question was open-ended and optional. The complete questions in the initial survey can be found in *Appendix C: Initial Survey*.

The second survey was completed at the end of the experiment. It consisted of thirteen questions. One question measured the Net Promoter Score (Net Promoter Score, 2016). Two

questions measured the user satisfaction. Nine questions measured ease-of-use. The final two questions measured the influence and awareness of accessibility using the interface. The complete questions in the concluding survey can be found in *Appendix D: Concluding Survey*.

Testing Environment

The experiments were conducted online. The tasks were completed using an online prototype using InVision. These sessions were moderated and were conducted remotely using Skype. The audio and screen interactions were recorded while test subjects were interacting with the prototype. Subjects were asked to use the "think aloud" protocol while completing the tasks. This method was used to communicate the thoughts and assumptions the user was making. Since tasks were not timed, the "think aloud" protocol was suitable.

Results

Six participants completed the experiment on the Grommet Theme Designer. A total of 26 issues were identified as shown in Table 1. All issues were analyzed and assigned a severity according to *Appendix E: Issue Severity Legend*. A root cause was identified and a recommendation has been proposed.

Table 1. Issue List

ID	User ID	Severity	Issue Description	Root Cause	Recommendation
3	1,2,5	1	The label for the vision simulation menu was not clear.	The "Typical vision" menu label was not clear in its placement or function. User was not familiar with the formal names for color blindness, so opening the menu didn't clarify the meaning or purpose.	Change the label and content for the Typical Vision menu.
7	1,2,3,4,6	1	The + icon for for font was interpreted as uploading a new font from the user's system.	The use of the + icon in the current position was confusing and led to incorrect assumptions.	Move the + to the right of the section header, not the field.
8	1,2,3,4,5,6	1	For colors that violate a contrast or WCAG standard, suggest color variations that are close but would meet the guideline.	Designer would have to "hunt and peck" to find a color that would meet guideline.	Give suggested colors that would meet the guideline.
11	2,5	2	Need more granular control in line weight	The three values are not adequate for designers.	Add slider to give more flexibility in the line weight.
12	2,3,4,6	2	Move all controls to be inline instead of split across the panel and the body of the page	Having some controls on the left panel and others (for color) in the body of the page was confusing.	Explore moving all controls to be inline and remove left panel.
24	6	2	Combine the design and sample sections so the body fo the page is a rich sample with enough components to get a feel for the theme	The design tab feels like a sticker sheet when it would be more valuable to feel like a sample app.	Combine the design and sample pages.
16	3,4	2	The purpose of the + icon for element style was not obvious	The + icon next to element style was interpreted as adding styles to more elements, not for styling each corner of elements.	Move the + to be next to the header of the Element style instead of the box.
1	1	3	"Save" button label is confusing as it's really allowing me to download it, not save it.	Button label not representative of actual function	Change "Save" button label to "Download"
4	1	3	Would like to see a stronger delineation between the color and typography sections	There are no section labels between sections. Section labels are quite small.	Make better use of typographic scale to delineate sections.

6	1	3	When changing font, don't change scroll position.	When changing the font, the prototype automatically scrolled the fonts to the top of the viewport.	Gracefully animate the scroll rather than abruptly setting scroll position.
10	2	3	Stroke weight and end cap are better terms for designers than line weight	Terms used are developer centric	Change terms to align with primary stakeholder vocabulary.
13	2,6	3	Add clarifying text to color blindness menu	For the untrained, these terms are not self-explanatory	Add help text to menu items to explain their meaning.
17	3,6	3	The description of color blindness was too much information	The paragraph of text was useful the first time, but too much for frequent use.	Keep link to read more, but remove text from reference site.
19	4,5	3	Provide ability to dismiss alert by choosing to use an accessible color over it for buttons.	If an alert is raised, allow user to easily overcome it by choosing foreground color	Allow alerts to be dismissed by forcing a given foreground color to be used.
22	6	3	Suggest removing font category and provide just a big list of searchable fonts	With a good search, the category field isn't required	Remove font category.
23	6	3	The typical vision menu doesn't really apply to the Develop section	The placement of the typical vision menu gives the impression that it should apply to the develop section	Move the typical vision menu within the design/sample page.
25	6	3	The share button should not be strong primary color	Share button demands attention but isn't important enough to warrant the emphasis	Remove primary button style from Share button
9	1,5,6	4	The sample should be a more complete sample that has all the components used from the design page.	The sample page is too simple and doesn't show all components to see how the theme looks and feels as a whole.	Provide richer set of interactive samples with all the components to help designer visualize the created theme.
15	3	4	Spacing of element styling was too close to fonts so was assumed to be associated with that section	The spacing between the sections in the left menu was not consistent.	Ensure padding between sections is consistent in final implementation.
2	1	5	Would like to download sample app to start as the basis for development.	n/a	Make it easy to apply themes to existing sample apps.
5	1	5	Would like to be informed of the contrast values between colors	n/a	Allow two colors to be selected and calculate the contrast between them to ensure it is adequate.
14	2	5	For the Sketch app, changes in Sketch should generate a new theme.	Allow further refinement within Sketch and allow those changes to be saved to a new theme	Explore ability for Sketch plugin to create new CSS content.
18	3,5	5	Would like to see a "certified" or "meets XYZ" to prove it's good.	n/a	Give confirmation that theme meets accessibility standards.
20	5	5	Would like to have a reference for the types of colorblindness and their descriptions.	n/a	Add help text or documentation page to allow designers to learn more about color blindness and accessibility
21	6	5	Would like to start with something at a higher level to pick a primary color and a warm, cool, soft, hard feel and have the default values align	n/a	Explore changing inputs to start at a higher level of abstraction and default the values accordingly
26	6	5	Add text over the colors with the color that is ideal for readability	n/a	Add a text label over each color swatch with appropriate color to meet accessibility requirements.

Net Promoter Score

The Net Promoter Score (NPS) for the Grommet Theme Designer was measured in the concluding survey of the experiment. It was calculated to be 34. The maximum value for NPS is 100 while the minimum is -100.

User Satisfaction

User satisfaction was measured in the concluding survey. As shown in Figure 2, it was rated 4 or higher on a Likert scale when participants were asked whether they were satisfied with the interface. Two of the responses dropped to a 3 when participants were asked whether the interface meets their needs.
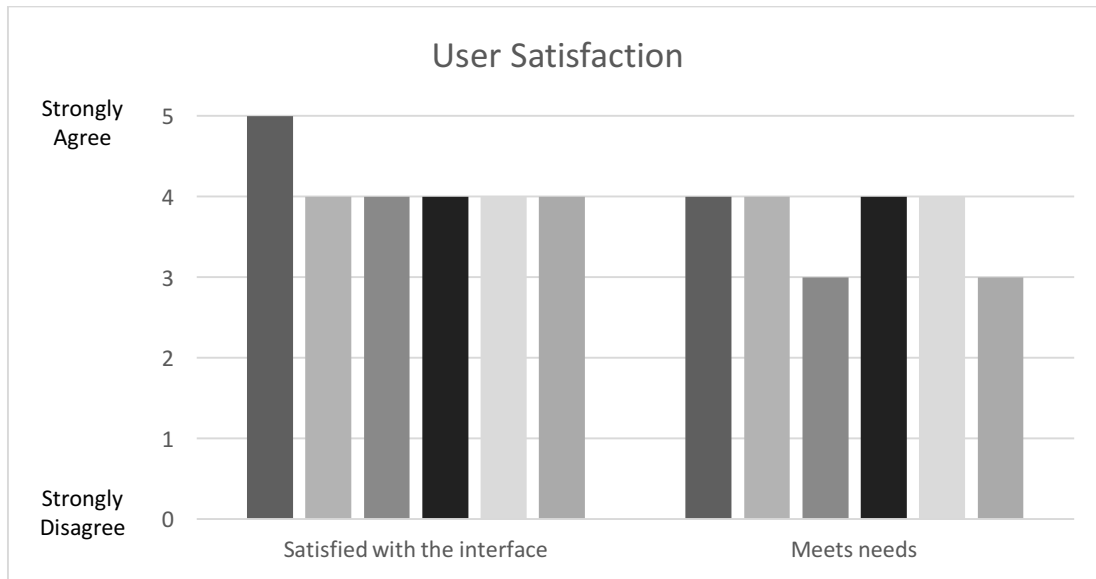

Figure 2. User satisfaction concluding survey results

User Friendliness

User friendliness was measured in the concluding survey. As shown in Figure 3 the responses were generally favorable with most responses being 3 or higher. The average score across the six users and 9 questions was 3.7 out of 5. The question regarding whether it was simple was the highest rated with an average of 4.3, while the the question regarding whether it was consistent was rated the lowest with an average of 2.8.
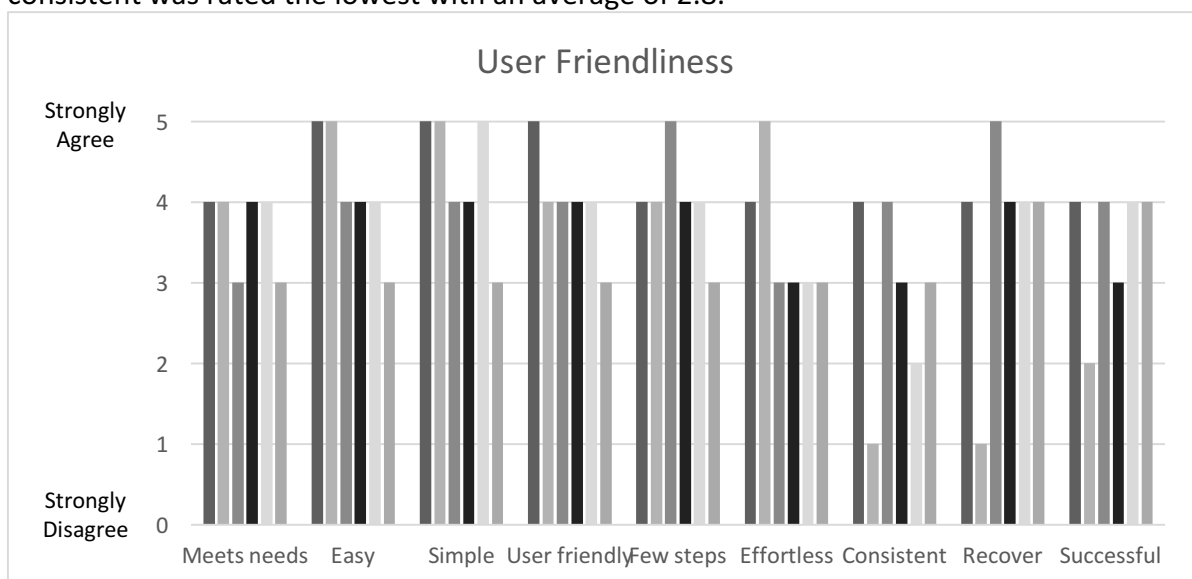

Figure 3. User friendliness concluding survey results

Accessibility Awareness

Accessibility awareness was measured both in the initial and concluding surveys. The responses in the initial survey in Figure 4 indicate 4 of the 6 users rated their accessibly awareness between 2 and 4 on a Likert scale, with the average being 3.7. Responses to the question regarding compliance with standards were lower with an average response of 3.5.
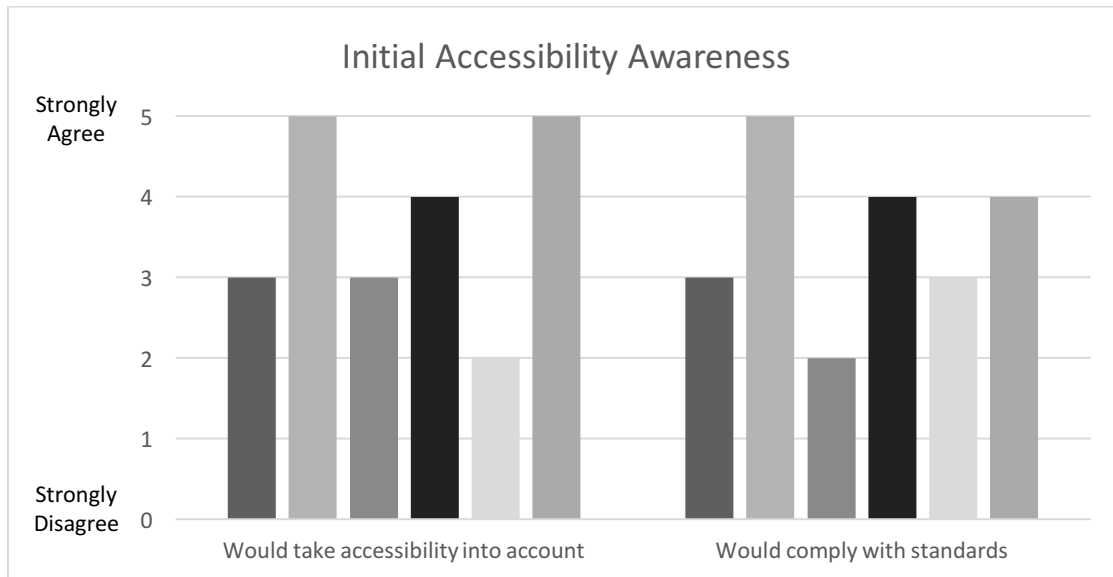

Figure 4. Initial accessibility awareness survey results

In the concluding accessibility survey results shown in Figure 5, all users rated their awareness of accessibility using the Grommet Theme Designer at either 4 or 5, with an average of 4.5.
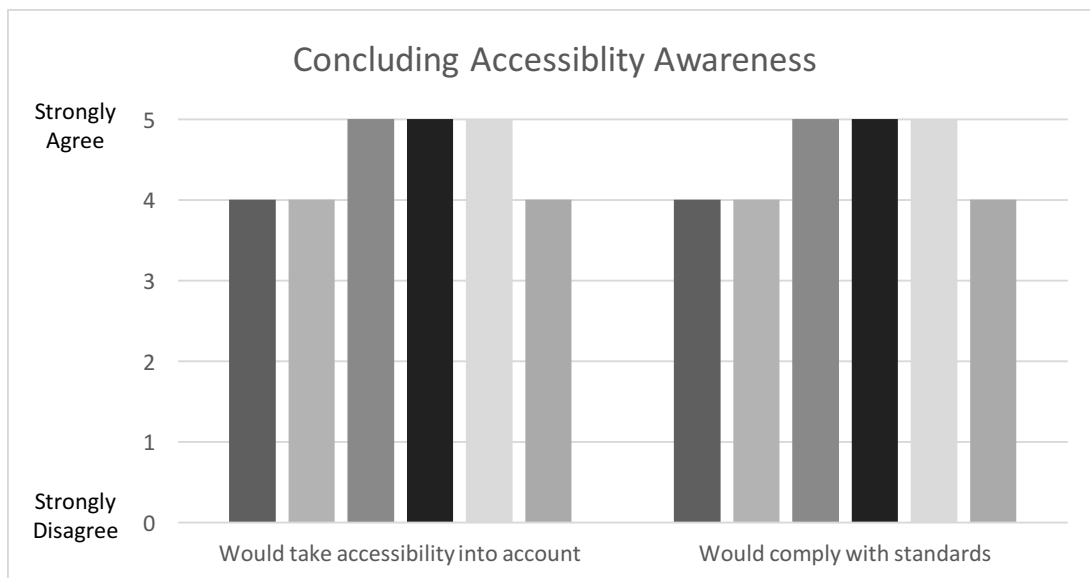

Figure 5. Concluding accessibility awareness survey results

Discussion

The overall feedback from test subjects showed the Grommet Theme Designer has potential. U1 stated, "This will be awesome" after completing the experiment (U1, 2016). The accessibility features were the highlight. While U4 was interacting with the prototype and encountered an accessibility recommendation they stated, "This type of feedback is awesome, man. Instant feedback that can guide selection of colors is great" (U4, 2016). U3 was even more enthusiastic, saying, "This would be insanely awesome." U3 went on to say, "This is definitely something new" (U3, 2016). U2 commented they "love" this feature (U2, 2016).

Issues

With the overall enthusiasm, there were several major issues identified with the system. The following issues were the most critical and have the greatest potential to improve the system.

Issues #12 and #24 were the most significant revelation in the experiment. When taken together, addressing these two issues will resolve many of the other issues identified. Issue #12 suggested moving all controls to be inline instead of split across the left side and the body of the page. Issue #24 suggested combing the Design and Sample tabs into a single page. Resolving these two issues would simplify the design and allow the designer to immediately see their theme in the context of a sample application instead of color blocks and typographic scales. As U5 stated, "I want to have confidence that my theme choices are being reflected, and they all fit together as I imagine them" (U5, 2016). Resolution of these two issues has the largest potential benefit in further simplifying the design.

Issue #3 involved the the placement and function of the Typical Vision menu. The placement being above the tabs, especially the Develop tab was confusing because it had no relevance to that tab. With the combination of the Design and Sample tabs as discussed above, this menu can be placed in body of the sample page so the control correctly maps to the function. Issue #13 is closely related to #3 in terms of the labels in the menu. U6 commented, "It's a little to Latin or scientific for me" (U6, 2016). As a result, the contents of the menu will be simplified for the layperson.

Issue #7 was encountered by 5 of the 6 users. The presentation of the "+" icon to add a secondary font was universally misunderstood.   Most users expected the "+" icon to allow them to upload a font of their own, instead of the intended purpose of allowing them to add a secondary font. This will be corrected when moving controls inline and allowing users to add a secondary font within the sample app.

Issue #8 was encountered by all 6 users. When an accessibility issue with a color is identified by the system, the system should suggest an alternate color that is as close as possible to the user's requested color, but corrected to meet accessibility guidelines.

Issue #11 is a relatively simple change to allow more fine-grained control over line weight. The three choices of bold, medium, and light were not sufficient to give the precision that some designers need.

Net Promoter Score
The Net Promoter Score is a benchmark used across industries to measure customer loyalty. It measures the extent to which customers and users will be either detractors, neutral, or promoters of your product, service, or brand. The Grommet Theme Designer received a score of 34 which is a strong score. This indicates when the solution is functional, there is strong likelihood users will promote it within their spheres of influence.

User Satisfaction and User Friendliness
The user satisfaction scores were very favorable. As the verbal feedback suggested, the test subjects were satisfied with its capabilities and excited about its potential.

The user friendliness ratings were moderate to high. Improvement is needed in the areas of consistency and recoverability where the user friendliness scores were lower.

Accessibility Awareness
Accessibility awareness was the highlight of the experiment results. Based on the class peer review feedback, this isn't a surprise but instead confirmation of the expected value this capability would deliver. The responses in this area were noticeably higher in the concluding survey and many of the unsolicited verbal responses from users were focused on this set of features. While subjects were more aware of accessibility at the conclusion of the experiment, there are issues relating to this capability that must be addressed to realize the full potential.

Summary
The experiment performed on the Grommet Theme Designer confirmed the hypothesis. The Grommet Theme designer was easy to use, it provided high user satisfaction, and it increased the likelihood that themes will be designed for accessibility. There are significant issues which must be resolved before implementing the design, but the experiment proved the potential of the Grommet Theme Designer.

Reflection
The prototyping and user feedback process is critically important. Even after a thoughtful design process, multiple design iterations, and a peer review cycle, testing the prototype with real users revealed many critical issues. This reinforces my belief that starting with low fidelity mockups that can be thrown away is a necessary step in design. In the case of the Grommet Theme Designer, another major design iteration is needed before starting implementation. The next steps are clearly understood and I'm eager to see the system get implemented and help designers create beautiful themes that are accessible to all users.

Appendix A: Script

Introduction

Today we're doing an experiment using an interactive prototype. The purpose of this experiment is to evaluate the design and usability of the Grommet Theme Designer for web-based applications and web sites. You will first be asked to complete an initial survey. Then you will use the prototype interface to design a theme. Your screen and audio will be recorded during this step. You will then be asked to complete a short concluding survey.

Consent Document

(Give link to consent document to participant)
This is the consent document that covers this experiment.
https://docs.google.com/document/d/1cY3BGC6w7YDt_Gl5Jx2iUD33gCn1Ghh03BPam4-hYQo/edit?usp=sharing

Initial Survey

(Give link to initial survey to participant)
http://goo.gl/forms/nzW6r67fd5

Prototype

(Give link to prototype to participant)
https://invis.io/ZG6CFJX69

We will use the interactive prototype for this part of the experiment. First, you will have one minute to familiarize yourself with the interface. During this time, you are free to explore the interface and perform any tasks you would like. At the end of the practice time, the interface will be reset to the home screen. Please begin familiarizing yourself with the interface now.
(Start timer, when time ends, proceed.)

Your practice time is up. Please navigate to this URL to reset your browser.
https://invis.io/ZG6CFJX69

The following tasks will be recorded. Please use the Grommet Theme Designer Interface to design a theme. Please do your best to "think out loud" and explain what you are doing, what you are observing, things you're assuming, and any insights or complaints you have.

When you're ready, please start.
When participant starts, take special note of any interactions the user attempts that do not work (which cause blue hints to appear). Prompt the user if they do not complete all of the following tasks.

    A. Color
        a. Select the desired primary color. (User stories II.a., II.b., and II.c.)
        b. Simulate various types of colorblindness. (User stories II.d. and II.e.)

      B. Fonts
          a. Adjust the font in the theme. (User stories III.a. and III.b.)
      C. Element Style
          a. Adjust the style of buttons, checkboxes, etc. (User story IV.a.)
          b. Adjust the visual appearance of icons. (User stories IV.b. and IV.c.)
      D. Review and Sharing
          a. While working on your theme, would you ever want to preview your theme? If so, how would you do that? (User story I.b.)
          b. Now you'd like to review your theme with clients, colleagues and developers. How would you share your theme? (User story I.c.)
          c. Now you'd like to download your theme. How would you accomplish this? (User story I.d.)
      E. Design tool
          a. Import the theme into Sketch. (User story V.a.)

After the subject has completed all of the above tasks proceed to the concluding survey.

Thank you for your time and feedback.

Concluding Survey
(Give link to concluding survey to participant)
http://goo.gl/forms/Y8vvqrisyh

Conclusion
Do you have any questions about the experiment? *(Wait for and answer any questions.)* Would you like to be sent a copy of the report that this data is used in? *(Wait for answer, record on consent document.)* Thank you for your time!

Appendix B: Consent Document
Participation and Privacy
Participation in this experiment is completely voluntary.
At any time you may choose to end the experiment for any reason.
Your privacy will be respected. Nowhere will your name appear on any of your results.
Your survey responses will be recorded anonymously.
Your interactive session using the prototype will be recorded in both the screen sharing as well as your conversation.

Benefits
While this experiment poses no direct benefit to you, improved web theme interfaces may benefit all designers.

Risks

The risks associated with this experiment are small.
You will be using your usual notebook/desktop computer.
Your screen and audio will be recorded while using the prototype which has a small risk of being snooped and used without your knowledge.

Would participant like copy of paper? Yes( )   No ( )

Appendix C: Initial Survey

Demographics

- What is your age?
    - o   18 to 24
    - o   25 to 34
    - o   35 to 44
    - o   45 to 54
    - o   55 to 64
    - o   65 to 74
    - o   75 or older
- Which of the following best describes your current occupation?
    - o   Software and web development occupations
    - o   Arts, design, and user experience occupations
    - o   Computer hardware occupations
    - o   Management occupations
    - o   Engineering occupations
    - o   Other
- Have you ever designed an application or website?
    - o   Yes
    - o   No

Creating Theme Questions

- I have designed my own theme (fonts, colors, controls, etc) for an application or website?
    - o   Yes
    - o   No
- When designing a theme, I take accessibility into account.
    - o   strongly disagree   1, 2, 3, 4, 5   strongly agree
- Of the themes I've created, most comply with international accessibility standards.
    - o   strongly disagree   1, 2, 3, 4, 5   strongly agree
- I generally take the following steps to ensure a theme is accessible. (optional response)
    - o   Long answer text

Appendix D: Concluding Survey

Net Promoter Score Question

- How likely are you to recommend this interface to a friend, colleague, or family member?
    - very unlikely 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 very likely

User Satisfaction Questions

- How satisfied are you with the interface you just used?
    - very dissatisfied   1, 2, 3, 4, 5   very satisfied
- How well does this interface meet your needs?
    - not at all   1, 2, 3, 4, 5   completely

Ease of Use Questions (Lund, 2001)

- It is easy to use.
    - strongly disagree   1, 2, 3, 4, 5   strongly agree
- It is simple to use.
    - strongly disagree   1, 2, 3, 4, 5   strongly agree
- It is user friendly.
    - strongly disagree   1, 2, 3, 4, 5   strongly agree
- It requires the fewest steps possible to accomplish what I want to do with it.
    - strongly disagree   1, 2, 3, 4, 5   strongly agree
- Using it is effortless.
    - strongly disagree   1, 2, 3, 4, 5   strongly agree
- I don't notice any inconsistencies as I use it.
    - strongly disagree   1, 2, 3, 4, 5   strongly agree
- I can recover from mistakes quickly and easily.
    - strongly disagree   1, 2, 3, 4, 5   strongly agree
- I can use it successfully every time.
    - strongly disagree   1, 2, 3, 4, 5   strongly agree

Accessibility Questions

- Compared to previous interfaces I've used, using this interface I would be more likely to take accessibility into account.
    - strongly disagree   1, 2, 3, 4, 5   strongly agree
- Compared to previous interfaces I've used, using this interface I would be more likely to create themes that comply with international accessibility standards.

o   strongly disagree   1, 2, 3, 4, 5   strongly agree

Appendix E: Issue Severity Legend

1. Usability disaster; must fix
2. Major problem
3. Minor problem
4. Cosmetic problem (more related to prototype itself than system)
5. New feature request

References

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