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Mentor: Dr. Shaundra Daily
DREU Site: Clemson University

Using User-Centered Web Design to Build an Accessible VENVI Website

Abstract:

The internet has become the main method of gathering information about anything in the world. Everybody uses the internet and the websites it hosts to fulfill their needs, so user accessibility should be the first thing web designers think about when designing a web page. One way to incorporate users' needs into a website is by utilizing the user-centered web design process while creating it. My mentor tasked me with the creation of a website advertising VENVI, a 3d virtual environment program that will help with her research, which aims to figure out how integrating motion with computer programming can promote computational thinking in young girls so as to increase the number of women in computer science fields in the future. In this report, I will show how I used the user-centered web design process to outline and create a user-friendly website to advertise and promote the software that my mentor and her team are creating.

Process:

My goal was to use the user-centered design process to make an accessible website that catered to a wide range of possible users while providing the necessary information about VENVI. To start, I will outline the major steps of the design process that I followed:

1. **Team Questionnaire**

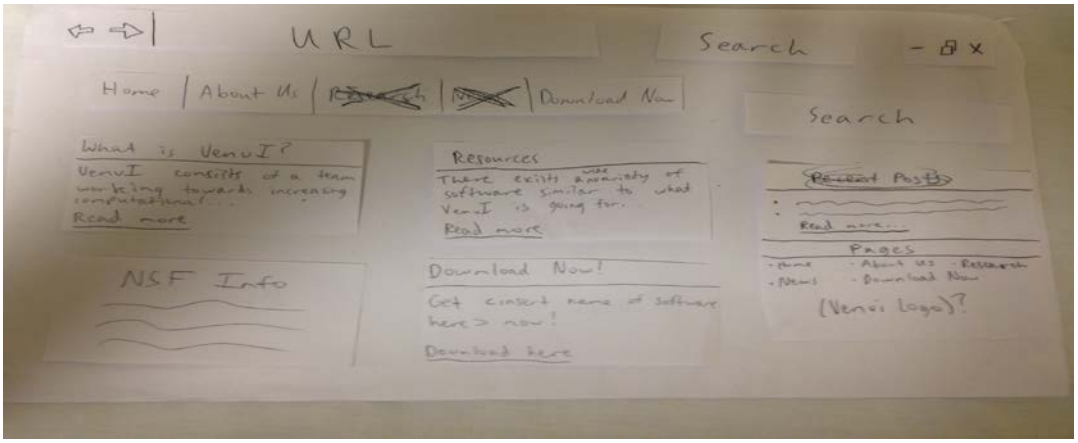
   I gave the team working on VENVI a questionnaire to get a sense of what direction everyone wanted the website to go. This was useful in that it gave me a lot of answers to questions I wasn't exactly sure how to answer and it ensured that everyone had an input on the website. I gained a lot of valuable feedback and suggestions, including the following:

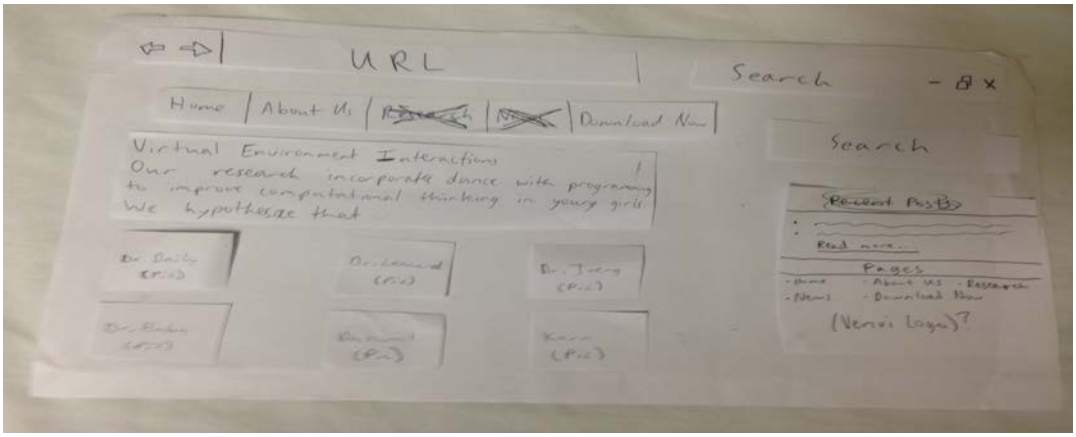
   - The website should be very easily navigable
   - Pictures should be used more than plain text to grab and keep the user's attention
   - The potential users of the site will range from young children to older people (parents and potential researchers)

   With this information, I drew some sketches of what the webpage would look like. Here are a couple of the sketches:

2. Paper Prototype/Usability Testing

The next step was in building a paper prototype for users to test, since it's much easier to edit and change than a direct online prototype (Cooper). In doing this, I used some art tools to make a model of the website using paper for users to interact with. I made each webpage as was drawn in the sketch and soon had the entire site set up on paper. Here is how some of it looked:





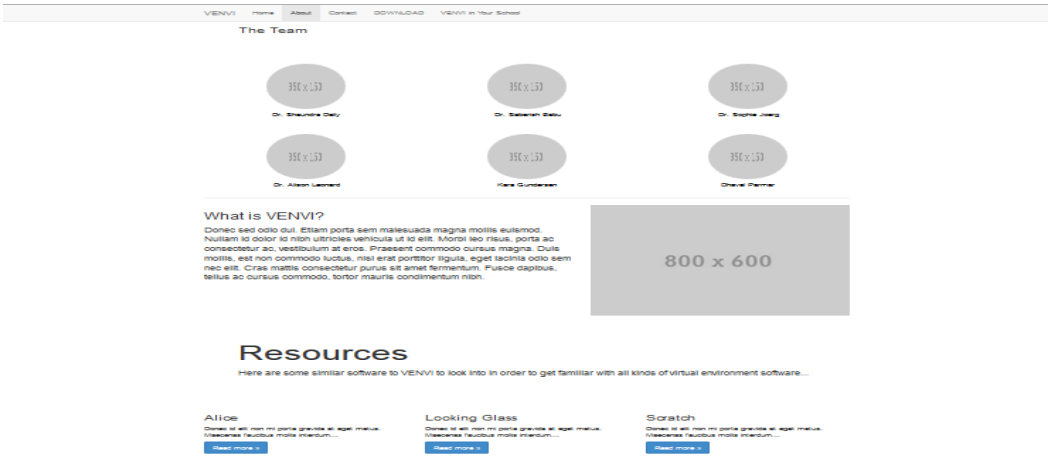
After testing, I gained some valuable feedback about what design elements didn't make sense and what I did wrong in some areas. Here's some of the feedback:

- I misplaced some elements, such as the individual about pages
- I fully omitted some important elements, such as a contact page
- I made some elements (NSF Grant info) too big
- Too much text was shown and not enough pictures
- Search and the persistent sidebar on the right side of the page were unneeded

After gathering all of that feedback, I re-sketched some things and moved elements around accordingly.

3. Wireframe/Online Mockup

In this step, from the sketches drawn after the prototype phase, I created a wireframe/online mockup using HTML and CSS with the Bootstrap library (the reason I say wireframe/online mockup is because I was already more familiar with HTML and CSS than wire-framing software, so it was easier to outline the positioning of certain elements in this format, making it more like a mockup). In doing this, I was able to implement the changes suggested from my paper prototype feedback on the computer, which would mirror where most users would actually see it from. This also makes it much easier to code and develop the actual website in the future. Here are some pictures of the mockup/wireframe:

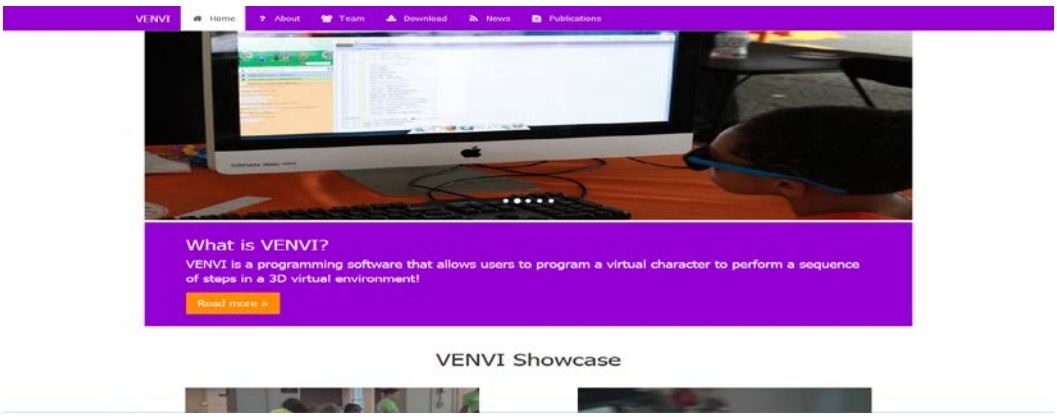


When I showed the wireframe/mockup to my team, I got more valuable feedback that would go into the actual website. Here's some of said feedback:

- The team members pages were unorganized; separate them by student, professor, DREU student
- Some elements were misplaced (instead of a contact page all by itself, combine it with the team members to make a team page)
- Publications tab was missing and news needed to be tweaked structurally
- Better organize download tabs and add an archive of older versions of the software

4. Implementation of Website

Now, using all of the feedback that I've gathered from users and my team, I implemented all of the changes into the final design for the website. Take a look at some of the pages:



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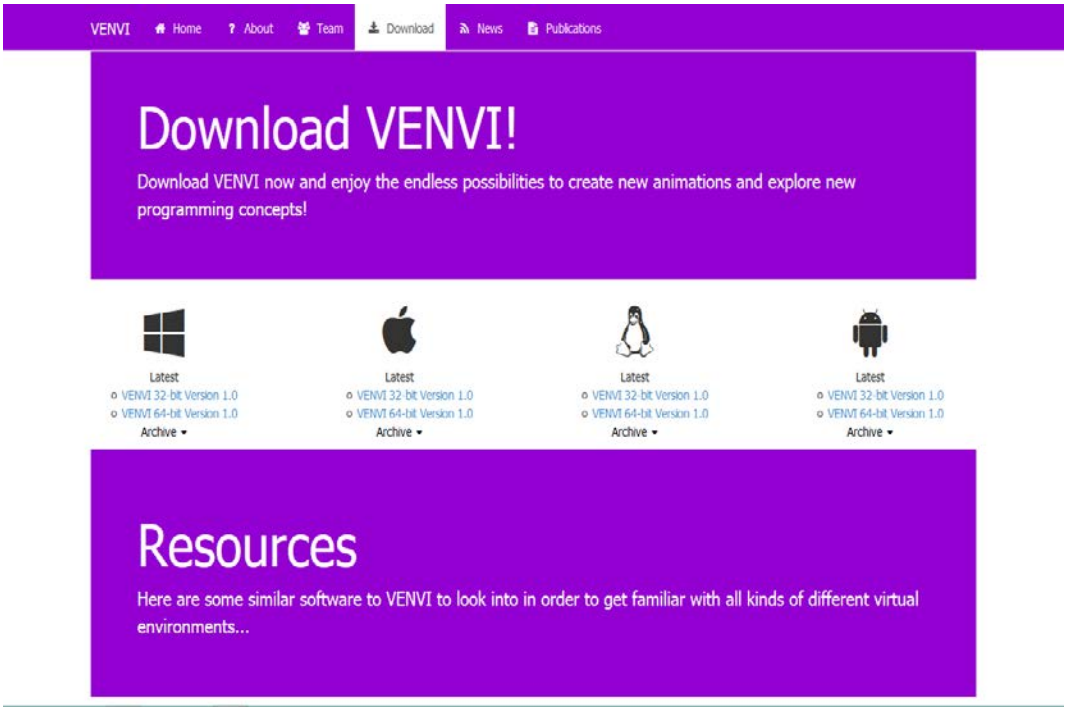

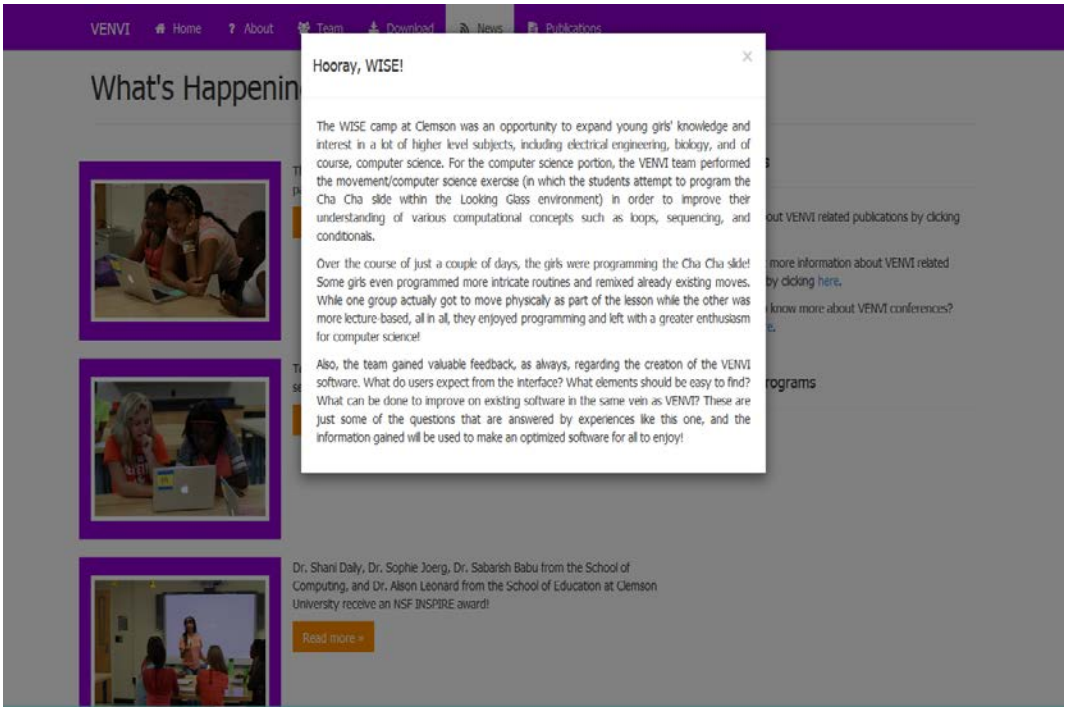

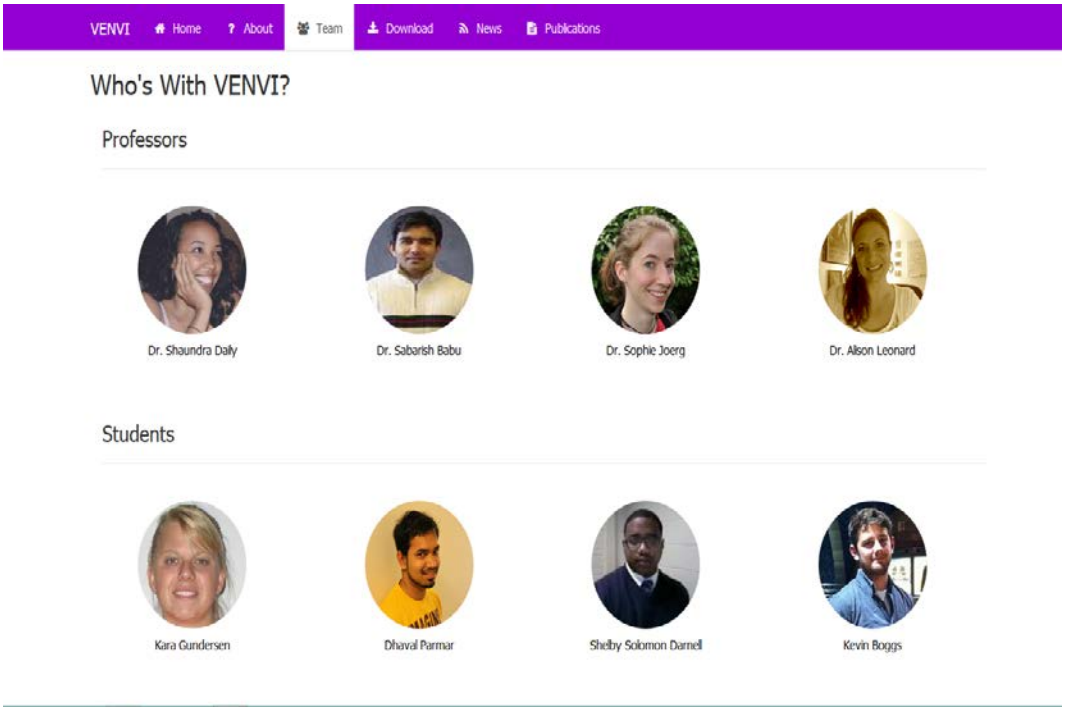
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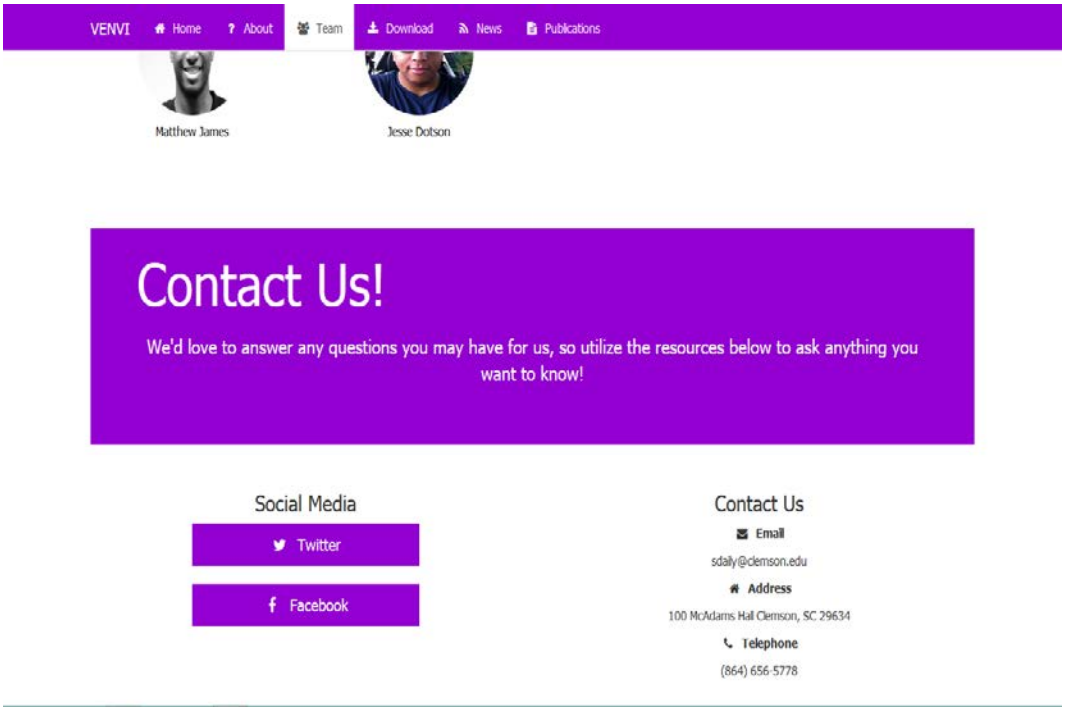
Dr. Alison Leonard
Students
Kara Gundersen
Dhaval Parmar
Shelby Solomon Darnell
Kevin Boggs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Matthew James
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Results:

I finished the website to the satisfaction of the VENVI team and my mentor while making it accessible to the users and nice to look at. Now, instead of the static blog that is the current iteration of the VENVI website, a more interactive and accessible model will be in place to inform users about the software.

Conclusion:

The website I created will hopefully reel users who look at it into downloading the VENVI software and learning programming. Also, while I was not directly related to the actual programming of the software, I am confident that it will be invaluable to the progress of the research and provide an enjoyable avenue through which young middle school girls can program in a fun and exciting way (through motion).

References:

1. Cooper, Alan. “The Perils of Prototyping”. *Cooper*. N.p., 15 May 2008. Web. July 17, 2014. http://www.cooper.com/journal/2008/05/the_perils_of_prototyping