

YOUTHSERVICES.NET

SIMPLIFYING ATTENDANCE TRACKING

Final Report by

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ABSTRACT

Youthservices.net is a web-based attendance tracking tool targeted at providers of youth service programs, such as non-profit organizations and school districts. The system is not intuitive to learn and many common tasks could be streamlined. Our design process started with contextual inquiries, personas, tasks, and affinity diagrams, then moved to paper prototyping, Balsamiq prototypes, and ended with an interactive prototype. Our usability tests included four tasks: adding a participant, editing a participant, adding a new group activity, and adding a new case note. Task times and number of errors for each task were measured, in addition to a post-test survey to capture the user's opinions of the prototype. The original website was used as a control condition. We did not test enough users to get statistically valid results; however, feedback from users during and after the tests was positive. The usability testing allowed us to pinpoint what we have created successfully and what flaws the new prototype still contains. Overall, the participants were satisfied with the new prototype more than the original prototype.

INTRODUCTION

Youthservices.net is a web-based attendance tracking tool targeted at providers of youth service programs, such as non-profit organizations and school districts. These clients need a centralized place to manage their data, including participants (name, age, birthdate, etc.), activities (meeting dates, times, enrollees), and attendance (who was present or absent at each activity each day). This data typically needs to be aggregated and reported to funders and evaluators in order to acquire and maintain grants. Before youthservices.net, most clients accomplished this with paper forms or spreadsheets. Collaboration and aggregation was time-consuming and error prone. Youthservices.net manages all this data and automates report generation for our clients.

Youthservices.net has been online since 1996 but has never had a dedicated graphic designer or usability specialist. As a result, the system is not intuitive to learn and many common tasks could be streamlined. The company has much to gain by redesigning their interface, including lower training costs, fewer help desk calls, and greater appeal when selling to potential clients.

DESIGN PROCESS

Contextual Inquiry

Before we started thinking about a website redesign, we conducted two contextual inquiries with current users of Youthservices.net. Both of the users are program administrators who had strong opinions regarding the existing user interface. The main everyday tasks of the users include entering new cases and running reports to make sure all the data has been entered correctly. In addition, the users oversee all program cases, collect and read case referrals and oversee cases' progress reports. From the interviews, we have learned about many pertaining issues with the website. For instance, the website was too slow, the transition between the pages had many unnecessary steps, and the website page layouts were inconsistent. Furthermore, we sent a survey to existing users to gain a better understanding of how the system is commonly used across a wider population of users.

After analyzing this data, we identified four main fundamental tasks performed on the website: entering a new case, running quarterly reports, entering new group activities, and entering new participants. We noted that clients use the system in many different ways (e.g. victim outreach vs. monitoring kids vs. group attendance).

We created several fictitious personas that resembled the interviewees during the contextual inquiries. However, as we worked through the redesign of the website, we modified the original personas to more accurately reflect the userbase of the system. We concentrated on two main personas for our redesign.

Figure 1 – The original website

Personas

Persona I

The first persona is a case manager named Judy. She is 32 and her main job is to interact with students. For instance, she helps them study, tutors them in various subjects (e.g. math, english), and gives them emotional support through active listening. She enters case notes, attendance, and student information (e.g. correcting names, birth dates, etc.). She is computer savvy and familiar with data entry and user interfaces, in addition to being a heavy internet user.



Figure 2

Persona II

The second persona is a 46-year-old program administrator named Autumn. She interacts mostly with case managers and other program administrators, but typically not directly with students. She is responsible for entering new activities and students (e.g. their names, birth dates, and parent's information) into the system. She is not as computer savvy as the case managers but is familiar with various forms, entering and searching for data online, and using different websites.



Figure 3

Affinity Diagram

We created an affinity diagram (see Appendix I) to cluster and sort issues we discovered during our contextual inquiries. We found that the website had several problems, including lack of error and save messages, inconsistent button labels, and inconsistent list sorting. We also pinpointed the main tasks that were performed using the website: entering new cases, running quarterly reports, entering group attendance, and entering new participants.

Task Flow

After creating the affinity diagram, we brainstormed and created paper sketches of the website workflow, as shown in Figure 4. For instance, we decided that one of the main workflows should be the following:
login page --> home page --> view participants --> participant's details page --> edit participant information --> save --> participant details page.

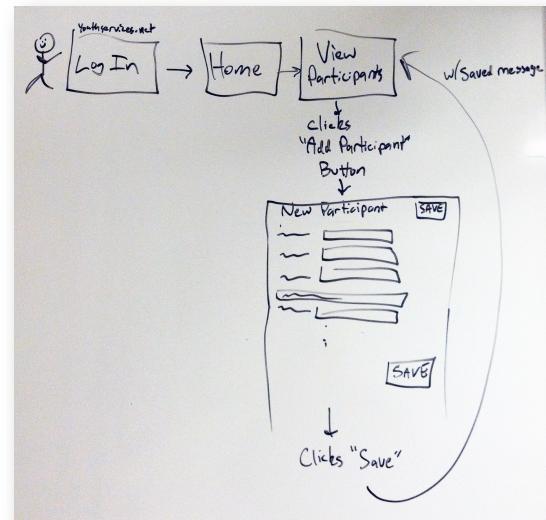


Figure 4

Prototype Sketches

After deciding on the page flow of the website, we created sketches of individual pages.

Using markers and construction paper, we created a low fidelity prototype. There were at least ten sketches of different pages (Figure 5 is an example of one of the sketches). Unlike the original Youthsevices.net website, we created a simple version of the search (text input and a search button) and created a dashboard view of the participant's details page.

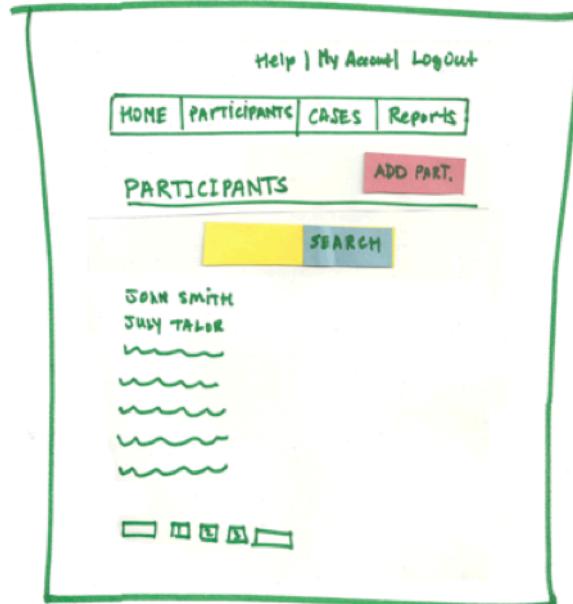


Figure 5

Balsamiq Prototype

After creating the lo-fi prototype, we used Balsamiq to create a refined version of the prototype. We added several changes to the Balsamiq prototype, including changing the navigation orientation from the top to the left and creating a hierarchy of headers. In addition, Balsamiq allowed us to create interactive faux functionality. For instance, buttons and links were clickable in order to demonstrate the task flows we had in mind. In addition, we mimicked saving data and displayed a “saved” notification message.

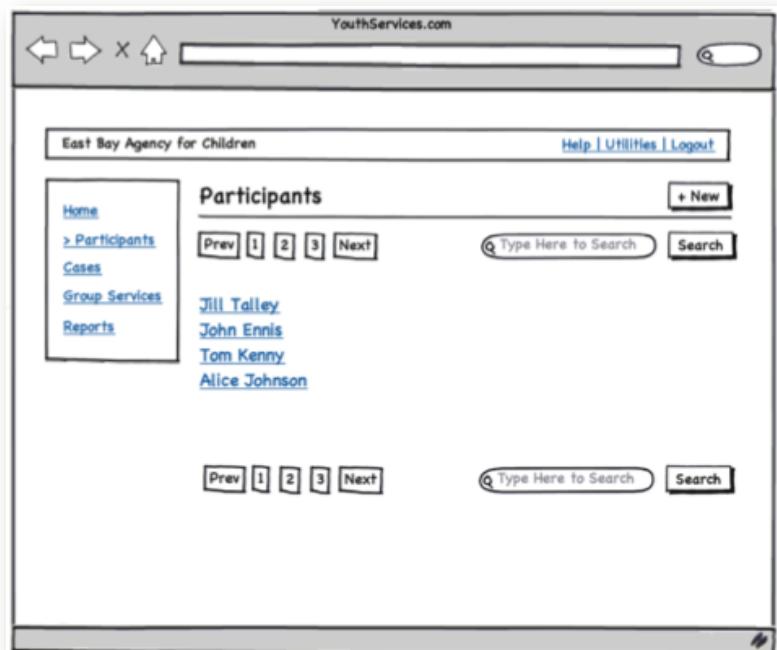


Figure 6

Final Prototype Implementation

The final prototype was implemented with HTML, CSS, and some PHP. These technologies were chosen for a number of reasons. First, HTML and CSS were used because Youthservices.net is heavily form-based, so in order for usability tests to be valid users needed to enter actual data into forms. Most prototyping tools do not allow this.

Next, a small amount of PHP was used to generate the header, footer, navigation, and lists on each page. This was useful so that we didn't have to copy and paste HTML across many different files, and so basic changes to the site only had to be made in one place. Finally, we are both comfortable with these technologies so there was no learning curve to implement our prototype.

There is a lot of functionality not implemented in our prototype. Since Youthservices.net has been used for over a decade, it has expanded to include numerous modules and to meet various client demands. As a result, our prototype only focuses on the core attendance tracking and case management tasks. For example, many clients track the test results of their youth, but our prototype does not account for this.

The screenshot shows a web application for 'East Bay Agency for Children'. The main title bar says 'East Bay Agency for Children' and has 'Help | Logout' links. On the left, a vertical menu includes 'HOME', 'PARTICIPANTS' (which is selected), 'GROUP ACTIVITIES', and 'REPORTS'. The main content area is titled 'Edit Participant' and contains several sections:

- General Info:** Fields include First Name (Linda), Middle Initial (S), Last Name (Robinson), Birthdate (1/5/1998), Gender (Male), and Email (ashley@aol.com).
- Race and Ethnicity:** A list of checkboxes for racial and ethnic categories: American Indian/Alaskan Native, Asian/Pacific Islander, Black/African American, Hispanic/Latino, and White. None are checked.
- Education:** Fields for Special Education (Y/N/Unspecified) and Grade (Pre-K-12). Grade is set to 'Pre-K'.
- School Attending:** A dropdown menu showing 'Heights Elementary'.
- Parent/Guardian:** Fields for Parent First Name (Sandi), Parent Last Name (Robinson), Relationship (Mother/Stepmother), and contact information: Home Phone (415-753-7500), Work Phone (415-555-0122), Other Phone (415-555-1234), Email (sanday@aol.com), Street Address (1511 Jefferson St), City (blank), State (blank), and Zip (blank).

At the bottom right of the form are 'Save' and 'Cancel' buttons.

Figure 7, URL: jlzych.com/youthservices.net

USABILITY TESTS

We tested five users and asked them to perform four tasks: add a participant, edit a participant, add a new group activity, and add a new case note. In addition, we used the original website as a control condition. Each participant interacted with the new Youthservices.net interface and the control condition. To control for learning or fatigue effect, we randomly assigned each participant to interact with the control condition at the beginning or end of the experiment. The participant followed the same four tasks in the control condition and in the experimental condition. The same evaluation metric was used in the control condition and in the experimental condition.

Two of the test subjects were potential new users who had never used youthservices.net before and fit our two personas (see “Personas” above). The remaining three were expert users (had been using youthservices.net for years). For the pilot test, we used our classmates. Furthermore, we tried to measure the ease of use of the website, how fast the participants completed the tasks, overall errors for the experimental and control conditions, and overall satisfaction of the prototype. We considered “success” when there were fewer errors, faster time completion, and overall positive feedback for the new prototype compared to the original website (control condition).

EVALUATION METRICS

Quantitative

To measure efficiency, we recorded task completion time and number of errors. Below you can see the average time and errors distribution for the experimental and control conditions. We started recording time after the user read the instruction and entered the login page. We stopped recording time when the user completed one of the tasks and said “done”. Errors were counted only when the user clicked a button or link by mistake (as opposed to a system error, like leaving a required field blank), or said “done” when they were not actually done. This method was chosen because our prototype did not implement system errors.

	Avg. Experimental (errors/ seconds)	Avg. Control (errors/ seconds)
New Participant	1/129.4	3/197.2
New Group Activity	0/138.6	5/219.6
Edit Participant	0/82.8	2/97.4
New Case Note	0/78.8	2/180.8

As seen from the data above, the experimental condition had on average between 2 and 5 fewer errors compared to the control condition and the task completion time was on average about 15% to 56% less in the experimental condition compared to the control condition.

Unfortunately, the number of participants was not large enough to get statistically significant results (such as through regression analysis, Anova, T test, etc.). Nonetheless, if these results hold across a larger test base then the new prototype is a better user experience compared to the original website. We ran a paired T test for the task times; however, the results were not statistically significant but are included in Appendix II (along with the distribution graphs of each user's test times).

Qualitative

To capture positive or negative feedback of the user interface, we recorded audio and took notes to record emotional responses and comments uttered. In addition, we used a questionnaire/survey at the end of the test to record qualitative evaluation. Overall, participants were satisfied with the new interface. They liked the nice layout and big text, search autocomplete feature, and notification notices (e.g. “save” messages). Nonetheless, several participants thought that the new prototype was not as comprehensive as the original website and lacked color/graphic design (both of which we were aware of going into the tests).

Please see Appendix III and Appendix IV for survey results and users comments.

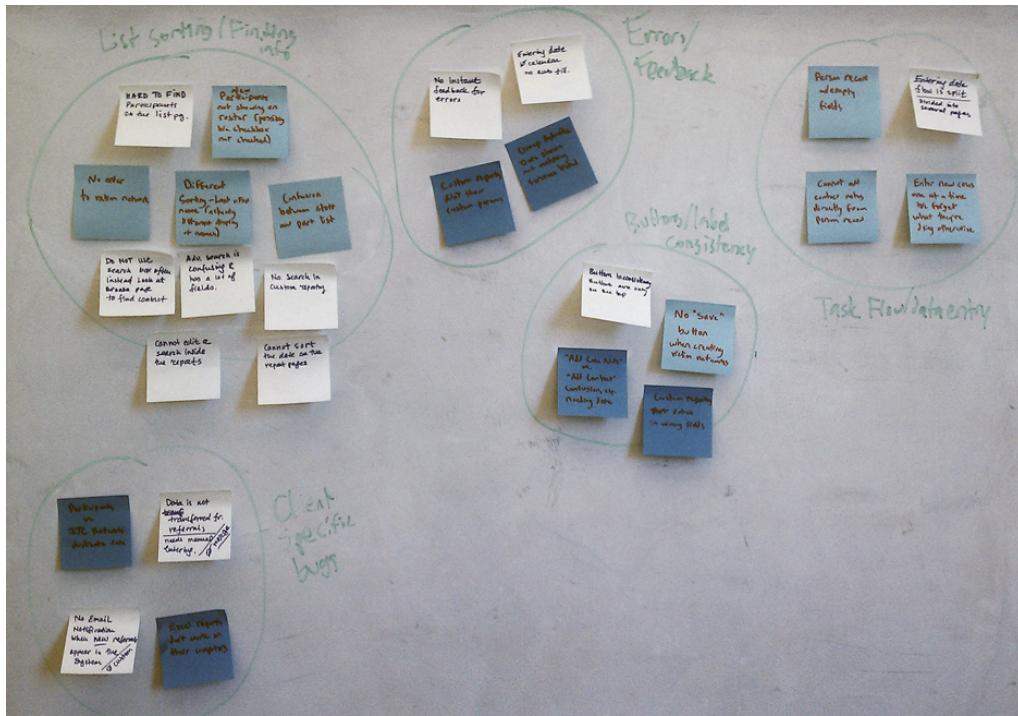
CONCLUSION

As our quantitative and qualitative results show, the interface is faster to use, less error prone, and well-received by our usability test participants. This is good early validation that shows we're on the right track; however, further testing is needed for many reasons. First, more test subjects are needed to obtain statistically valid results. Second, there are hundreds of existing clients with varied needs, so more testing is needed to verify our interface works better (or at least not worse) for all of them. Finally, the prototype is far from comprehensive in terms of functionality (as discussed in the "Final Prototype Implementation" section), which no doubt skewed the results in our favor. These issues are easily addressed by implementing missing functionality in our interface, testing additional users, and iterating.

For the future modifications, we would like to add more graphic design elements to the HTML prototype, such as better colors, icons, buttons, and better designed navigation. We would also like to expand functionality of the website by adding missing modules alluded to above, ability to pull reports, and searching by ID numbers.

APPENDIX I

Affinity Diagram



Balsamiq Prototypes

East Bay Agency for Children

Group Services > Basketball

General Information

Date Range: 3/20/08 - 4/20/08
Times: Tue., Thurs. 10:30 AM - 11:30 AM
Categories: Counseling

Enrollees

Tom Kenny
Jill Tally
John Ennis
Jay Johnston
Jerry Minor

[View All >](#)

Attendance

Date	Time Range	Count
3/20/08	10:30 AM - 11:30 AM	(5/5)
3/22/08	10:30 AM - 11:30 AM	(4/5)
3/27/08	10:30 AM - 11:30 AM	(5/5)
3/29/08	10:30 AM - 11:30 AM	(3/5)
4/2/08		

[View All >](#)

Group Services Overview

Edit Participant

General Information

Name: John Ennis
Birthday: 10/02/91
Gender: Male
Address:

[Edit Picture](#)

Comments

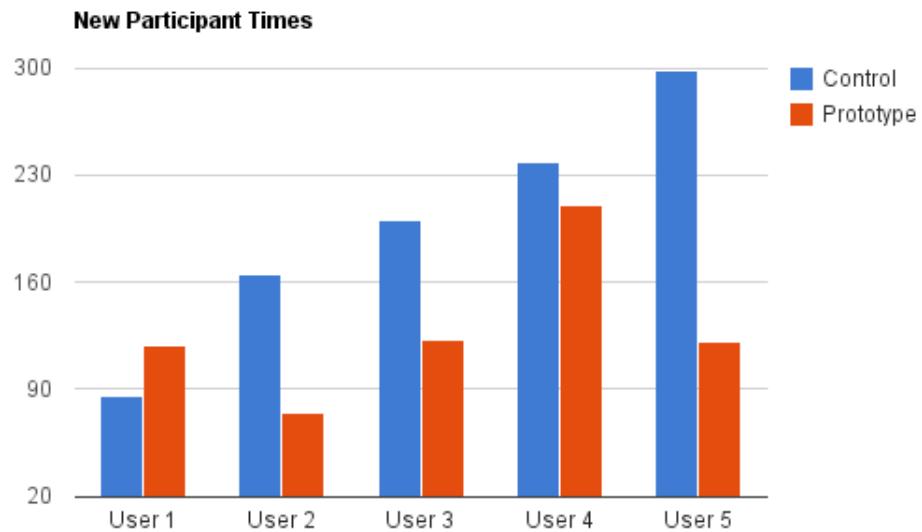
[Cancel](#) [Save](#)

Edit Participant Form

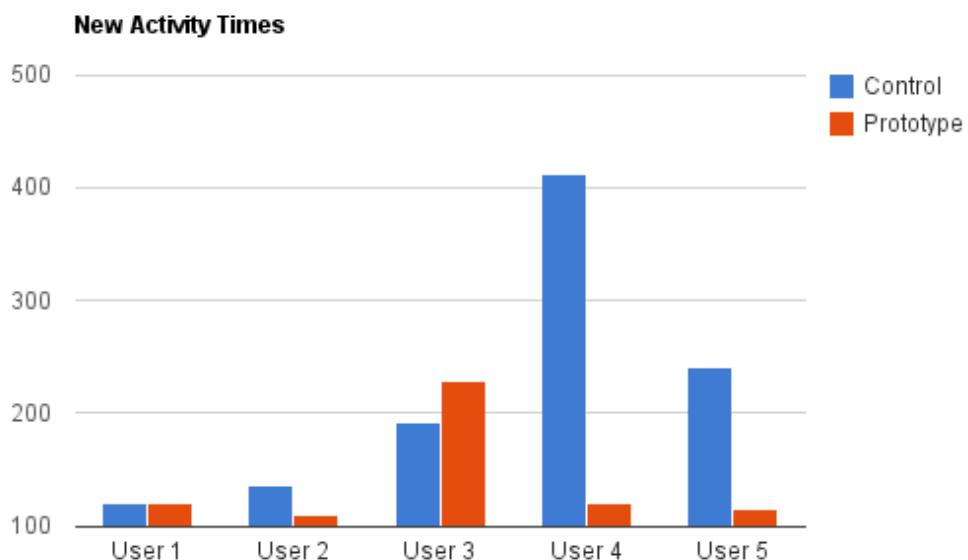
APPENDIX II

Evaluation Results

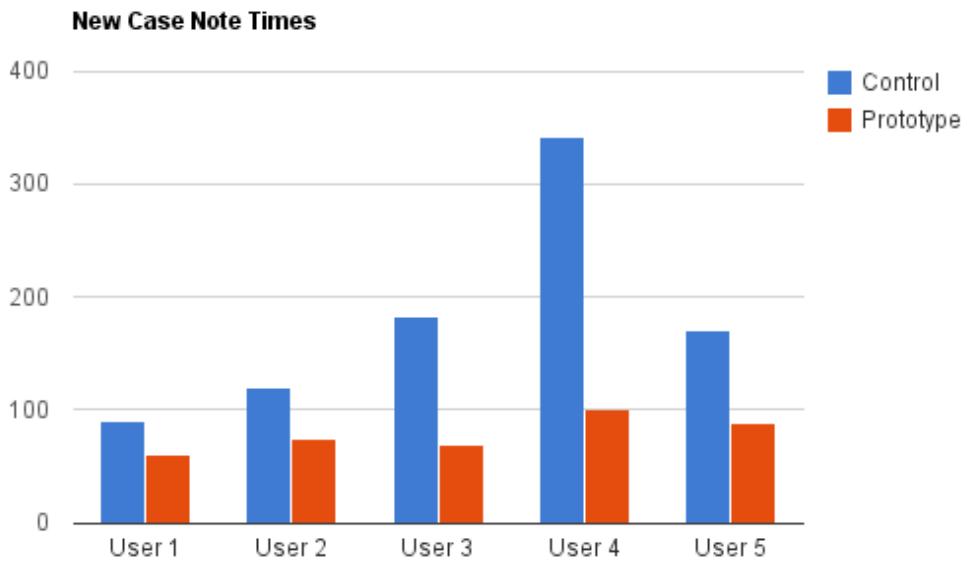
The charts below show the task times for each test user. Although overall the prototype was faster to use than the control, none of the results are statistically significant according to the p- values calculated using a paired t-test.



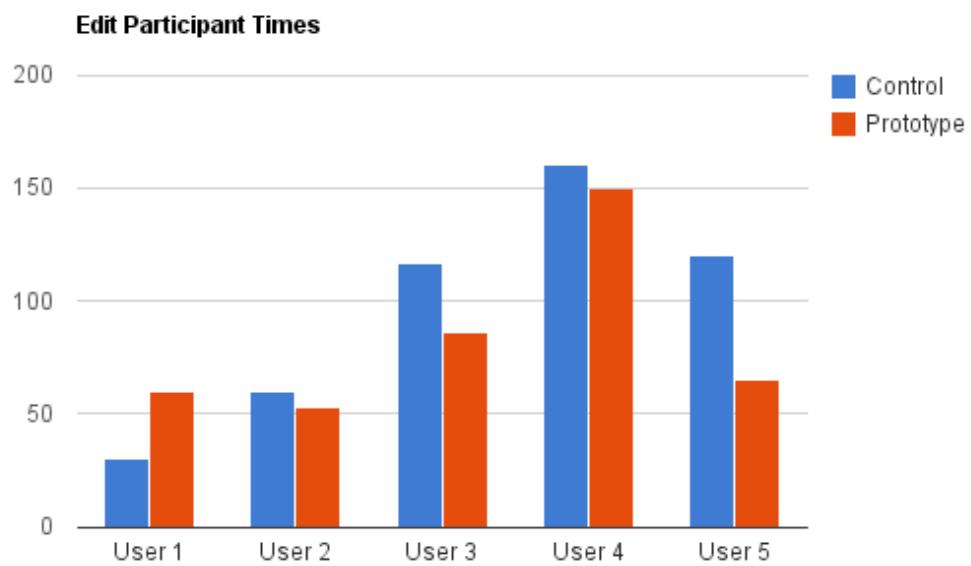
The mean time to enter a new participant was 197.2 seconds for the control, and 129.4 seconds for the prototype. The two-tailed p-value was 0.1246, which is not statistically significant.



The mean time to create a new activity was 219.6 seconds for the control, and 138.6 for the prototype. The two-tailed p-value was 0.2430, which is not statistically significant.



The mean time to enter a new case note was 180.8 for the control, and 78.8 for the prototype. The two-tailed p-value was 0.0535, which is not quite statistically significant.



The mean time to edit a participant was 97.4 for the control, and 82.8 for the prototype. The two-tailed p-value was 0.3586, which is not statistically significant.

APPENDIX III

Notes Summary, Errors & Time

User	New Participant				New Group Activity			
	Control	Notes	Proto	Notes	Control	Notes	Proto	Notes
1 Times	85			"First name came up, 119 that's nice"	120	Added 30 seconds to time b/c she didn't actually type the description (just "blah blah blah")	120	Confused about time entry - 24 hour clock or AM/PM?
1 Errors	0			0		Initially thought she was done, then realized she hadn't entered any categories yet	0	
2 Times	165		75		135		110	
2 Errors	0		0		0		0	
3 Times	200	- Confused by two add buttons - Having a calendar is nice, if it lets you do both, but it's weird that the calendar starts at 2011 for the birthday. - Don't like that it doesn't say that it saved it and stays on the same page.	122		191	The tab's font size is too tiny	228	"Dates, don't know how do I put the date in... Give an example." For the description, it would be nice if it showed how long, # of words it should be (word counter).
3 Errors	0		0		1	Added single date instead of repeated dates. Confused about add dates	0	
4 Times	238	Calendar doesn't work until you type in date	210	Checked first if participant exists. "I find this website as more user friendly"	412		120	Likes repeats for multiple days
4 Errors	2	- Search instead of adding; - Can't get the name to show up	1	Hit "Return" to go to text input but saved instead	3	- Switched to events instead of group activity - Confused by time selection (am v pm) - Could not save, time already existed - Thrown off by the fact that "Group Services" and "Individual Services" have their own buttons, whereas participant types do not have their own buttons - No notice that data has been saved	0	- Remarked "This is awesome" when he saw the time/day input - Wanted more instructions for time input (AM/PM) - Liked the save notice at the top
5 Times	298	- After saving, remarked: "Stays on stupid create page"	121	Didn't like "Save" button on the right	240	saved	115	top
5 Errors	1	Went to check participant was created and searched by "last name" when he thought he was searching by "first name"	0		0		0	

Number of errors and task completion time in seconds for New Participant and New Group Activity tasks (for Control and New Prototype).

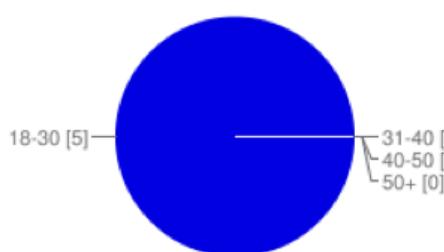
Edit Participant				New Case Note			
Control	Notes	Proto	Notes	Control	Notes	Proto	Notes
30		60		90	Added 15 seconds to time because she didn't type the full case note (just "blah blah blah")	60	
0		0		0		0	
60		53		120		75	Initially confused at lack of "Individual Services" or "Case Notes" left menu item
0		0		0		0	
117	No Save button at the bottom	86	It's nice that when searching by first name, it still finds it and shows the last name first	182		69	Again the whole date thing
0		0		2	Confused on where to click. Don't like to click on extra tabs. "I would like to just click on the student link."	0	
160		150	Browsed list instead of searching	342		101	
1	Forgot to save, but no major problems	0		0	Confused about where to go, had to guide them. Could not find where to add text until she scrolled down.	0	Wanted to go to Reports first
120		65	First move was to search for participant, liked the autocomplete	170	Confused by two add participant buttons when selecting which participant to add a case note for	89	Found it very easy to find where to add a new case note
1	Clicked "Participants" > "Youth Participants" when he meant to search	0		0		0	

Number of errors and task completion time in seconds for Edit Participant and New Case Note tasks (for Control and New Prototype).

APPENDIX IV

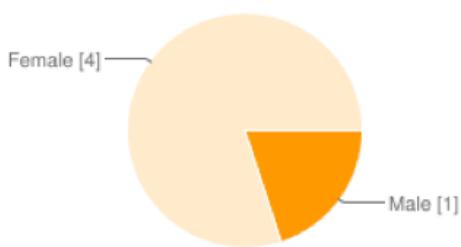
Qualitative Summary (Post Test Survey Summaries)

Age Range



18-30	5	100%
31-40	0	0%
40-50	0	0%
50+	0	0%

Gender



Male	1	20%
Female	4	80%

What are your overall impressions about the layout of the site?

Basic layout, "barebones" style, but it had everything that was needed to complete the tasks. I do like the "recently updated" records and group activities on the home page, and the "save" button at the bottom of the reg forms (as opposed to only on the top). Site is very plain, but I understand it's not meant to look 'pretty' right now. The layout looked clean and simple. I liked that actions were represented by buttons, while navigation was represented by links. The layout of the site was different from the first to second site. The first site was less cluttered, easier to navigate, larger ...

What are three things you like best about the site?

1. List of recent actions on home page
 2. "Help" link located on upper right next to "Logout," so it isn't cluttering up the left menu
 3. Initial page for a specific group activity shows an enrollee summary and an attendance summary
- I like that the Group Activity entry was reduced to a single page. This makes data entry go much faster, though I wonder if it would negatively affect processing speed when saving/creating

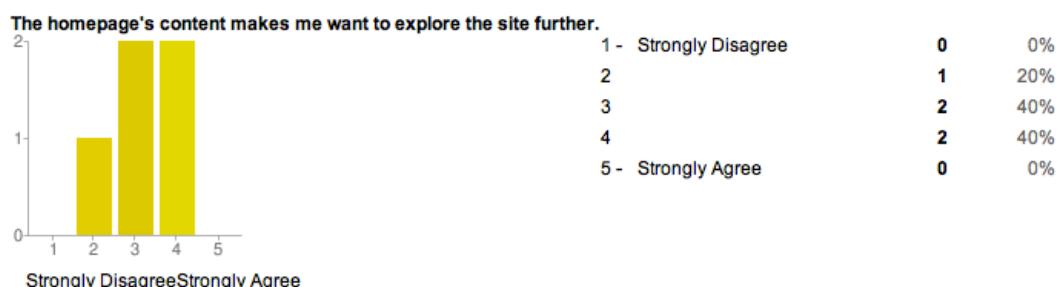
an activity and dates, all in one action. I also like that there was a list of recently updated records, as that seems to be a trend across many systems that allow multiple user...

What are three things you like least about the site?

1. When creating activities, you can't vary the times (i.e. the times entered have to apply for all the selected weekdays, instead of having different start/end times for each day. This is particularly important for CA ASES activities when they have differing start times throughout the week, to accommodate minimum days). However, this may just be a result of a more stripped down version of the site 2. List of group activities only shows names, and not the dates 3. Home page ONLY shows the recently updated info, and no other info about the site itself (site coordinators, site contact info, etc...)

General Site Usability

Please rate how strongly you agree or disagree with each of the following statements. 1: Strongly Disagree 2: Somewhat Disagree 3: Neither agree nor disagree 4: Somewhat Agree 5: Strongly Agree

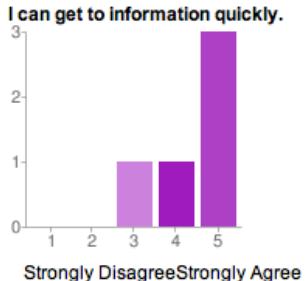


It is easy to find my way around the site.



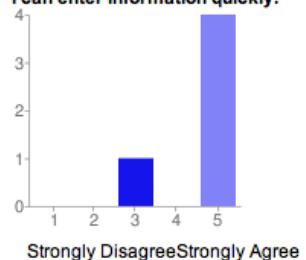
1 - Strongly Disagree	0	0%
2	0	0%
3	0	0%
4	0	0%
5 - Strongly Agree	5	100%

I can get to information quickly.



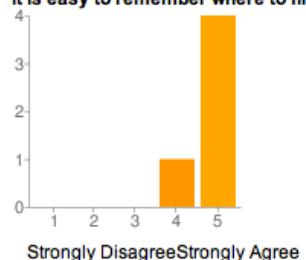
1 - Strongly Disagree	0	0%
2	0	0%
3	1	20%
4	1	20%
5 - Strongly Agree	3	60%

I can enter information quickly.

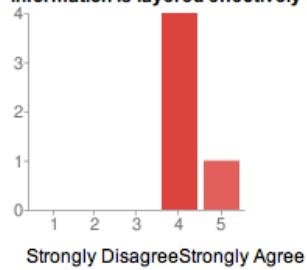


1 - Strongly Disagree	0	0%
2	0	0%
3	1	20%
4	0	0%
5 - Strongly Agree	4	80%

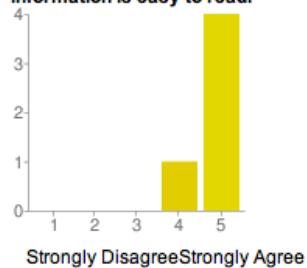
It is easy to remember where to find things.



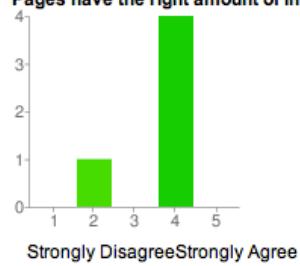
1 - Strongly Disagree	0	0%
2	0	0%
3	0	0%
4	1	20%
5 - Strongly Agree	4	80%

Information is layered effectively on different screens.

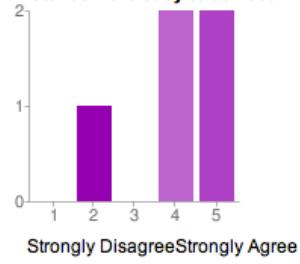
1 - Strongly Disagree	0	0%
2	0	0%
3	0	0%
4	4	80%
5 - Strongly Agree	1	20%

Information is easy to read.

1 - Strongly Disagree	0	0%
2	0	0%
3	0	0%
4	1	20%
5 - Strongly Agree	4	80%

Pages have the right amount of information.

1 - Strongly Disagree	0	0%
2	1	20%
3	0	0%
4	4	80%
5 - Strongly Agree	0	0%

Mistakes were easy to correct.

1 - Strongly Disagree	0	0%
2	1	20%
3	0	0%
4	2	40%
5 - Strongly Agree	2	40%