# LabRAT Task Management Tool

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## 1. INTRODUCTION

LabRAT is a lab communication and task management tool designed to help professors manage labs and assign tasks. It also creates a page with all the professors information:

***Background*** : LabRAT makes it easy and fast to create a website for yourself and your research lab, even with no web development experience. It provides a central place to find research opportunities and apply to become a research assistant, simplifying the recruitment process.

***Expected types of users*** : Professors, Graduate Students, Students and Lab Members.

***Contexts of use*** : Our system will typically be used by professors and students in a school setting. This system will most likely be used to assign tasks and obtain information.

***What the system will be used for*** **:** LabRAT creates a website for professors and provides a means to manage their Research Labs.

***Constraints*** : A large constraint on our project was the amount of time given to work and the people we found to test our webtool.

## 1. REQUIREMENTS GATHERING

### *Data gathering method*

The core idea for our project began with a request from a male UCSC Psychology professor around 55 years old with very little web development experience, for a personal website that would display his basic information and allow undergraduates to apply to be research assistants. As we were not going to be available to maintain the website or make changes, we decided that it would be best to make the system with some sort of easily editable interface that would allow the professor to make changes without needing to use any code, just simple forms.

Once the HCI course began, we expanded on this basic idea, to a tool to manage a research lab, and involved more potential users to understand what the requirements of the system would be. We had informal discussions with 2 other UCSC professors from the psychology department, one with some web development experience and one with considerable experience, as well as 3 graduate students who were working in those professors' research labs. All of these potential users had similar complaints with the current systems they were using. Communication within their labs was almost exclusively done via email, which led to many problems such as misplaced emails and more. Task management was a very common request from all those interviewed, with one lab using google docs currently and the rest using nothing but email communication to assign and manage tasks. Another thing that stood out from these initial discussions was that each professor had a unique method of receiving and reviewing research assistant applications. This was inline with our personal experiences as undergraduates who had sought research opportunities in various labs. As we looked for labs to apply to we found that there was no central location for openings or lab descriptions, rather each professor had their own website (personal or

created through the university), their own applications, etc.) and the only way to find a listing of all the research labs was to make a phone call to the psychology undergraduate advising office and be directed to multiple web pages with partial listings. This process was frustrating and it became clear that application process (email, physical fulfilling the requirements of a lab management tool laid out by those we interviewed, would allow for a listing of these labs and professors that would be much easier to navigate when looking for a lab to join.

Below is a list of the competitive analysis that we did in order to refine our requirement list.

***Competitive analysis***

| | **Professor's Websites** | **Wordpress** | **E-mail** |
|---|---|---|---|
| **Strengths** | - Easy to access (Just google Professor and the website link comes up)<br>- Professors are completely in charge of content and its organization. | -Fairly easy to use compared to coding a website by yourself. | - Well-known and mostly everyone knows how to use it.<br>- Quick and simple to send emails. |
| **Weaknesses** | - Websites often have too much unorganized content.<br>- Can be hard to see important links.<br>- Everyone has separate websites instead of having one central network where Professors, graduate students, and undergraduates can communicate.<br>- The quality of the website depends on the professor's experience level and time spent. | - Not very user friendly<br>- Many plug-ins you need to learn how to use.<br>- More features than needed usually confuses users if they are not experts. | - Not organized.<br>- Incoming emails are not easily filtered.<br>- Difficult to maintain group conversations through email.<br><br>e.g. Professor's get too many emails which are hard to filter so they forget about them. |

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|---|---|---|---|
| **Examples** | Professor Whittaker's website: http://people.ucsc.edu/~swhittak/Steve_Whittaker_Santa_Cruz_HCI/Steve_Whittaker.html<br>Professor Kawamoto's website: http://psychology.ucsc.edu/about/people/singleton.php?&singleton=true&cruz_id=ahk | Mercedes Benz website made with WordPress: http://www.mercedes-benz.com/en/<br>Snoop Dogg's Website made with Wordpress: http://snoopdogg.com/<br>Find more here: https://wordpress.org/showcase/archives/ | UCSC Gmail, Yahoo, Hotmail, Aol, MSN, |

As described in detail above, we used a combination of Ideo methods modified to fit our project, in order to form our requirements, including Activity Analysis, Character Profiles, Competitive Product Survey, Five, Whys, Unfocus group, Be Your Customer, and Try It Yourself.

1. **REQUIREMENTS ANALYSIS**

# Vincenzo Bartoli

***"As someone in charge of a number of research assistants and the work they are supposed to do, I need a tool that can help me effectively manage my team so I can ensure the highest quality results."***

## Key Characteristics

Vincenzo is a 24 years old, second year astrophysicist graduate student running his own research under the direction of his astrophysics advising

professor. He has taken on four qualified, but new research assistants this quarter and is having trouble organizing his group's efforts, and is looking for more.

## Background

Vincenzo has always been a hard working student and scientist, and has finally settled in to his new position as an astrophysics graduate student at UCSC. The professor he is working under was so impressed with the work he did during his first year that he gave Vincenzo his own lab space to conduct research for the next four years. Now in his new role as manage, Vincenzo feels equipped with dealing with the task of communication within the lab, as he has never been in charge of something so administrative. He simply wants communication within his group to be efficient , but also allow the public to see some of the astounding work that is sure to come out of his new lab.

## Goals

Create a website for his lab group that he can easily manage, will give the public something to see regarding his work, as well as a space for his group to collaborate and communicate effectively.

## Frustrations

Has no experience with web development and doesn't have time to learn. He currently has no way to advertise the work he's doing, except through social media sites like Facebook and Linkedin, which he does not like using.

# Emily Clark

***"I would love a tool that streamlines website creation and makes it easy to facilitate. While i have the necessary tools and experience to create a website myself, I often don't have the time."***

## Key Characteristics

34 years old. Originally from Blackwell, Texas, Professor Clarke has BA in Computer Science from Notre Dame, and recently received a Masters in Computer Engineering UC Berkeley. She recently started

teaching in UCI and has a lot of classes to teach, so she barely has any time to respond to emails much less create a website on her own.

Background Emily is a professor recently recruited by the Computer Science Department in UCI . his is her first year as a professor, and is familiar with languages such as python, ruby, C#, C etc. from her udies at Notre Dame and Cal. Her area of expertise is in creating and engineering things from robotics to mulations. While she knows how to create and manage a website, she is more concerned with getting erself appropriated with UCI's campus and the classes she teaches..

Goals Emily wants to have the tools or an app to create a website with relative ease and quickness.

Frustrations Emily is swamped with work concerning her classes, Research Assistants as well as esponding to emails. She wants to create a website herself for better communication with her students but doesn't have the time to make it herself.

# Jeremy Smith

***"I really want a tool that allows to have an efficient and effective communication with professors. They are always busy but we need answers as soon as possible."***

Key Characteristics 21 years old. From San Francisco but attends University of California, Santa Cruz. Third year of Computer Science major and working in Professor Jacksons research lab. It is the second year he works in the lab so he has experience.

Background Jeremy is a Computer Science student. He applied for the research Lab to get some experience and learn directly from a professor. He knew that it was going to be hard to combine his studies and the lab but he really think that it is a good way to learn from first hand. However he is always struggling with time and busy but he is really organize and gets time for everything. He usually finds problems in the research lab when getting feedback or answers with the professor. Professors are busy and have more important things to attend and unwillingly sometimes forget to answer or help Jeremy. Jeremy does not want to be struggling if it is not going to be worth it.

Goals Have an effective and efficient communication in the research lab with the professor. Talk to other students in the lab to coordinate research possibilities.

Frustrations Does not have time to go to the professor's office so instead he emails. He does not like to waste time because of the inefficient communication.

# Melody Wu

***"I love the lab communication tool because I can easily apply to RA positions and get really fast feedback from Professors."***

Key Characteristics 20 years old. Originally from San Francisco butattends University of California, Santa Cruz. Third year cognitive science major who wants to get into Professor Lakemere's research lab. It is the second year she has applied to the lab because she wants to gain experience. She enjoys talking to people and likes to discuss and collaborate with others.

Background Melody Wu is a third year cognitive science major. She applied for the research Lab to get some experience and learn directly from a professor. She is a third year cognitive science major who wants to work and get experience in the HCI lab.

Goals Wants to have a good working relationship with her colleagues including the other undergraduate students, graduate students, and the Professor. Melody also wants to learn how to be effective and efficient when it comes to communication in the research lab with the professor. Talk to other students in the lab to coordinate research possibilities.

Frustrations Melody does not have time to go to the professor's office to turn in the RA application. She thinks it would be easy if there was a website she can just apply on with her resume and transcript.

# Kevin Mitchell

***"I try to stay on top of emails, especially those from members of my lab, but it can be difficult. I have many other pressing things every day. I can't miss a lecture, or my daughter's birthday, but my research matters to me and I wish there was a more efficient way to manage the lab."***

Key Characteristics Kevin is 48 years young and has been an Associate Professor at UCSC for the past 7 years. He teaches courses in Psychology, Linguistics, and Anthropology. His research focuses on ancient languages, learning about the cultures that used them and gaining insight into how language affects society.

Background He received a B.S. from UCSD, double majoring in Psychology and Anthropology. For the next 2 years he traveled around the globe working on various Anthropological projects, helping to discover and map a previously unknown Mayan ruin on the Yucatan Peninsula. He returned to school and got a Ph.D in Psycholinguistics from Brown University and after a few years working in other research labs, began teaching and conducting

his own research at UCSC. Currently, he has 2 graduate students and 6 undergraduate students working in his lab. The graduate students have each been working with him for a little over 2 years, while 3 of the undergraduates have been assisting his lab for almost a year and the rest are new this quarter. He currently teaches three classes that require time to plan as well as lecture and meet with students. He has a wife and two children, ages 9 and 11, that also demand and deserve much of his time. His research is important to him but he occasionally feels that other things take precedence and he is unable to manage his lab as effectively as he desires. The University has put pressure on him recently to make a website rather than use their listing which only shows basic information. He is working on doing this with Wordpress but he has little time and this is low on his list of priorities.

## Goals

Communicate with the members of his lab quickly and efficiently as well as monitor and facilitate their communication with each other. Make a better website for himself with little effort and time.

## Frustrations

Sometimes his work day can become hectic and it is difficult to keep track of all the emails regarding his lab and respond in a timely manner to those that he wants to. He can get bogged down with small questions that other RA's could have answered instead or by being unnecessarily cc'd on long conversations between lab members. He wants a better website but cannot find the time to learn how to make what he really wants, and finds Wordpress limiting and hardly better in terms of time required.

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| **Name** | Melody Wu | Jeremy Smith | Vincenzo Bartoli | Emily Clark | Kevin Mitchell |
| Persona Characterized By | Undergraduate student who is very interested in applying to a Professor's lab. | Undergraduate student who currently works in the lab. | Graduate Student running the site for their Prof. | Tech-Savvy professor who was recently hired at a university | Not so tech-savvy professor juggling managing his research lab, teaching, and his personal life. |

| Age<br>Occupation<br>Gear | Age - 20<br>years old<br>Student<br>Majoring in Psychology and Cognitive Psychology | Age - 21<br>years old<br>Student<br>majoring in Computer Science | Age - 24<br>years old<br>Works for the professor but is not a web developer by trade | Age - 34<br>Computer Engineering<br>Professor | Age - 48<br>Professor in the psychology / cognitive science department. |
|---|---|---|---|---|---|
| Quote | "I love the lab communication tool because I can easily apply to RA positions and get really fast feedback from Professors." | "I really want a tool that allows to have an efficient and effective communication with professors. They are always busy but we need answers as soon as possible. " | "*As someone in charge of a number of research assistants and the work they are supposed to do, I need a tool that can help me effectively manage my team so I can ensure the highest quality results.*" | *"I would love a tool that streamlines website creation and makes it easy to facilitate. While i have the necessary tools and experience to create a website myself, I often don't have the time."* | *"I try to stay on top of emails, especially those from members of my lab, but it can be difficult. I have many other pressing things every day. I can't miss a lecture, or my daughter's birthday, but my research matters to me and I wish there was a more efficient way to manage the lab."* |
| Customer Profile | Melody wants to work in the HCI field. Working with a Professor in the lab will help her gain the skills she needs to get a job. | Jeremy combining his studies as undergraduate with the research lab so he need to use his time in an efficient way and get a useful experience from the lab. | Vincenzo has a lot of other work to do for the lab, so having a tool which assists managing a website and communication makes his job that much less tedious | Emily has a lot of work taking up her attention leaving her with little time to create and manage a website on her own | Kevin has many other things that demand his time. His lab is important to him and he wants to make it easy for interested RA's to apply. He feels that communication to and |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | between his lab members could be better. He also needs to make a website and doesn't have the skills or time to build what he wants. |

# IDEO Methods used to create personas:

**IDEO METHOD FOR MELODY is Surveys and Questionnaires (Ask):**

We gave a survey to Melody where we asked questions about the process of applying to the RA position of multiple labs of Professors and Graduate Students. Some of the questions that were asked included, "How easy is it to apply for RA positions?" "Did you understand how to look through all of the RA postings efficiently?" "What can be enhanced?" "What features did you like the most?" The process was very quick because Melody had to just sit down and write down her answers.
Melody's answers are listed below:

"How easy is it to apply for RA positions?"

- It is super easy to apply for the RA positions. I liked the interface because it is really easy to navigate through the Professor and Graduate Students labs and see what kind of research they are doing.

"Did you understand how to look through all of the RA postings efficiently?"

- Yes I did!

"What can be enhanced?"

- I think the web tool looks really great and works efficiently. I think one way it can be enhanced is getting a notification when a new RA posting is made so I can apply really quickly.

"What features did you like the most?"

- I liked that you can search for what kind of position you are looking for.

**IDEO METHOD FOR JEREMY is Narration (Ask)**: We used this technique

on Jeremy, an undergraduate student that currently works in a lab for a professor in Computer Science. We were with him in the lab and asked him to narrate a specific task. The task that he did was communicating with the professor via emails. This is the situation:

Jeremy was currently working with a partner in the lab doing some research on a topic. The professor wanted a summary and a conclusion of their research in a week. They want to know if they should include some aspects to the report. They decide to email the professor but he is "Julia has given me the list of articles that we need to use but some of them are marked with an "x". We don't know if that means that we should use them or not."

"*(To Julia)* I think we should ask the professor because we cannot start until we don't know this and we don't have that much time."

"I am opening my Gmail account to email the professor."

"*(While typing the email)* We sometimes have to wait for his reply because he is really busy and I guess he receives a lot of emails during the day and sometimes skips mine. Once I emailed him and he never responded me. I talked to him and he told me that he might have skipped over my email because he was replying to another professor and forgot about my email."

"Okay I have sent the email. I hope he answers soon. This is really a problem because I don't think I get the feedback or answers when I need them and then I waste time waiting for them. Then we will have to do the second part really quickly and we won't learn as much as we would have if we had had more time. Sometimes I think that professors should have a separate tool for the lab or a way to notify that the email is from the lab."

taking to long to respond. Until they get the reply they cannot continue their report.

This is the narration:

"I am here in the lab working with my partner Julia. We are doing a research on the internet's effect on society that professor Jackson assigned to us three days ago."

"We are now finishing the first part. Let's start the second one."

From applying this technique we have realised that what lab students need is a tool that isolates their emails so that professors have them there and do not lose them.

**IDEO for Vincenzo - Social Network Mapping (Look):** When looking at Vincenzo's issues, it is obvious that he is dealing with a social issue, one that revolves around getting people connected to the work that he wants to do. In order to help him as much as possible, we looked at the social network structure that already exists within his lab, specifically how it is failing to communicate in its current state.

Currently, Vincenzo is using the system already put in place by his advising professor, that is, emails and weekly meetings. All of the data collected

for the experiments they are running, as well as documentation for how to run the studies is handled through the school email. The head researcher (the professor) sends emails to his graduate students daily, instructing them on new ways to collect data or about ways they are falling short in their data collection methods. Although this works for his advisor, Vincenzo want's a space for his group to collaborate online, as the school's email system is out of date (they don't use gmail services, but they have a drive account set up for certain documents).

Vincenzo needs to be in contact with not only his research assistants and his professor, but also prospective undergraduates and interested

The public display of his work is something that could help Vincenzo out with these prospects. It gives them a basic idea of the work he is already doing. If an application system is built into this public display, the amount of emails he would get for applying to work with him would reduce the number of excess emails he receives through the school.

Most importantly, Vincenzo needs to be in close contact with his research assistants. Currently, the only method to reach them is by email or phone. When contacting his entire group, mass emails with attachments are the only solution. What he really could use is a platform which all the RAs in his team can look at and communicate upon simultaneously(similar to google drive). In this space, they could share documentation as well as data.

astrophysicists. He is bombarded with emails from excited undergrads everyday, but has little time to respond to them, let alone read them. These emails gunk up his school email, making it harder for him to communicate in general.

The undergraduates that contact Vincenzo can be a nuisance when it comes to effectively communicating with his lab, but they are still people that Vincenzo would love to get into contact with when he has time. However, because it takes a significant amount of time to sort through these emails, it is something that Vincenzo is afraid of undertaking in the first place and instead chooses to use his time in ways he thinks are more important. If managed properly, Vincenzo could get more work done in less time.

**IDEO for Emily - A Day in the Life (Look)**

Every day Professor Clark wakes up at 7:00am starts getting ready for her commute which takes about an hour. At 8:00am she lectures her first class of the day for about 2 hours. Afterwards she holds office hours for her students until a meeting with her department at 11:30am. The only time she has to eat while at school is 12:30pm to 1:00pm, after which she teaches for her second class of the day. After her lecture at 2:00 she has another meeting with graduate students applying to be her assistants, and meets with the TA's of the class. At 5:15 Professor Clark gets ready for her drive back home. Due to LA traffic she does not get home until 7pm. She has a quick dinner with her fiance and spends the rest of her night replying to emails and settling her housing paperwork. At 11 She finishes off any left over paperwork before going to bed.

**IDEO for Kevin - Five Why's (Ask)**

As part of an informal interview with Kevin Mitchell, I used the Five Why's method to gain a deeper understanding of his attitudes and behavior around managing and communicating with his lab. While discussing how he chooses which Research Assistants work in his lab:

Interviewer: "Why do prospective RA's email you sporadically throughout the quarter and in mass near the end of each quarter"

Kevin: "As part of their undergraduate degree many students need to participate in a lab. I ask them to wait until the end of the quarter but some do not listen."

Interviewer: "Why do you ask them to wait?"

Kevin: "It is easier for me to deal with a number of applicants all at once than throughout the quarter. Also the information that they give me is more recent."

Interviewer: "Why is it easier to deal with them all at once?"

Kevin: "I get them as individual emails with a paragraph or two of their interests and why they think they'd be a good fit in my lab. It's just hard to keep track of those throughout the quarter, much less read them and keep track of who I've given a spot to."

Interviewer: "Why do they email you individually and in that format?"

Kevin: "I ask them to. On my website, it says to email me with a brief description of their research interests and why they would be a good fit and attach an unofficial copy of their transcript. "

Interviewer: "Why do you have them use that format and email?"

Kevin: "I used to ask undergraduate students to come to their department and pick up a paper copy of an application, fill it out, and take it to their office. I got complaints that it was hard to find me in my office and that people would prefer to not have to make multiple trips to the department. I felt like this was a way to modernize that process and it certainly became easier, but I get so many emails every day that it is hard to manage them all."

The same method (Five Why's) was also used to further explore his attitudes and behaviours with regard to communicating with and between the members of his lab.

***Scenarios.***

**Vincenzo Bartoli**: Vincenzo has a lot of other work to do for the lab, so having a tool which assists managing a website and communication makes his job that much less tedious.

**Emily Clark**: Tech-savvy professor who just got hired at the university. Emily has no time to create a website because she is a new professor. She uses LabRAT to help her make a quick website.

**Jeremy Smith**: Jeremy combining his studies as undergraduate with the research lab so he need to use his time in an efficient way and get a useful experience from the lab.

**Melody Wu**: Melody wants to work in the HCI field. Working with a Professor in the lab will help her gain the skills she needs to get a job.

**Kevin Mitchell**: Kevin has many other things that demand his time. His lab is important to him and he wants to make it easy for interested RA's to apply. He feels that communication to and between his lab members could be better. He also needs to make a website and doesn't have the skills or time to build what he wants.

***Use cases***. Professor needs a new profile, manage tasks and labs. Students want to obtain information about a professor. Students want to apply to become part of a lab or research position. Graduate students wanting to manage a lab or assign tasks.

*Requirement summary*.

**Functional/Non-Functional Requirements**

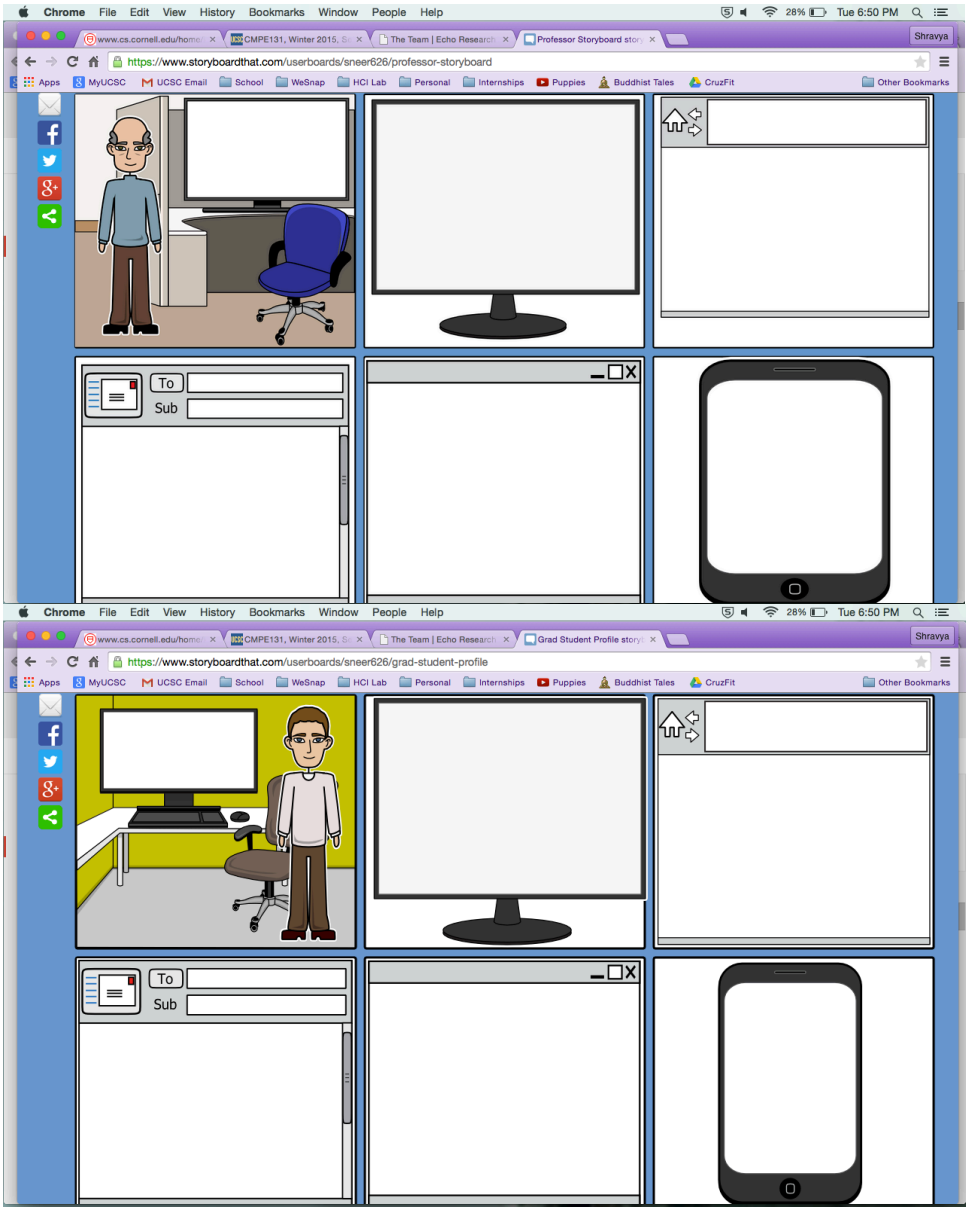
| Functional Requirements | Type of Priority and Reason |
|---|---|
| The web application will allow users to create an account, log in and out, and edit their personal information. | High Priority. This will allow users to access different parts of the site, communicate with each other, and be able to use the features of the site. |
| The administrator will be able to approve users accounts, allowing them to add their personal info to a profile and access the forum. | High Priority. This will allow Administrators to have the ability to grant access to the users so they can create their own personal profile. |
| The web application will create a website customizable by the administrator. | High Priority. This is the entire purpose of this web application. |
| The generated website will include an application that the administrator can customize and users can fill out and submit for review. | High Priority. As this is a website designed for professors, streamlining the application process benefits both students and professors. |
| The website will contain a forum with access and use restricted to logged in users. | High priority. Users should be able to communicate with students/staff quickly and efficiently |
| The web application will have a directory of websites that have been created by administrators. | Medium priority. This would allow users to easily find the different websites from a central location. |
| The web application allows Administrators to upload files. | Low Priority. There is not a huge necessity for Administrators to upload files but it could prove useful. |

| Non-functional Requirements | Type of Priority and Reason |
|---|---|
| The web application will be accessible on mobile devices through the browser. | Medium Priority. Most users will be accessing the web application from computers. |
| The web application will be free of bugs and errors. | Medium Priority. We do not have enough people to manage and facilitate the system. |
| The creation of a new website through the web application should be highly user friendly, guiding them through the creation process | High Priority. We want to make sure that administrators who are not tech savvy can create their own site with ease. |
| The editing of personal information as well as other website content should be simple and easy for any user, especially for those with little experience with computers/web development. | High Priority. A specific strength of the web application and created site is that it will be easy to use and appeal to users with little to no web development experience. |
| The homepage by default will display the administrator's information (picture, bio, selected works, contact info) and be easily modified by the administrator. | High Priority. Pictures and information are crucial to the webpage experience; the application simplifies the process of website creation. |

1. **LOW FIDELITY PROTOTYPES**

1. **Storyboard**

We had users work together to create storyboards of an ideal software tool to help them manage and communicate with their lab. They were given templates of interactions with a computer, outlines of a computer screen, and outlines of a mobile device's screen.




To recruit users for the storyboard we sent them the following email:

*"Hi _____,*

*As part of my Human Computer Interaction class, my group and I need to recruit users to create a storyboard for a lab management/communication tool. We are creating a web application that would allow Professors, Graduate Students, and Undergraduate RA's to easily communicate.*

*We need you to help us. We will give you a template like the one shown below which you can quickly fill out. The process will take about 20 minutes.*

*If you would like to help us design an effective web application, please respond with some times that you may be available, the sooner the better.*

*Thank you very much for your time."*

We recruited two professors, three graduate students and two undergraduate students. We had several sessions: one with a professor and two graduate students, one with a professor, a graduate and an undergraduate student, and then one graduate student by himself and finally, an undergraduate by himself. In these sessions they would talk between themselves to address the issues that they had and draw on the templates we gave them, how they would ideally like to interact with a system like the one described. They could use as many templates as they needed. These were the questions that we asked them:

*"Undergrad: How do you currently go about applying for a lab?*

*I. Professors/Grad Students: Imagine using software which makes it easier to apply to a lab as well as communicate with current lab members. Show us how you would use this and what it would look like ideally.*

*II. Professors/Grad Students: Imagine using software which makes it easier to set up a website for your lab. Show us how you would use this and what it would look like."*

We then took all of the ideas on the user generated storyboards and compiled them into a coherent plot and final storyboard.

We analyzed the feedback that we got and decided to include two new features in our tool that were explained to us as required by the users. We added a tasks level in the hierarchy which will be now labs with projects and then taks. Users would be able to create tasks for each projects. The other feature that we included is the "Mark as complete" option which would provide a double check option before finishing a task. This allows professors and lab managers offload the work of making sure tasks are complete onto fellow lab members. In addition, we also learned that the communication aspect of our website wasn't as useful and required as we had initially thought. Through the sessions from the storyboarding we received feedback from one expert user that explained to us how this feature is usually not very welcomed and used in systems like this one. When an application takes up the responsibility of communication between a group, they often fall short of their main competitor, email (Whittaker & Sidner, 1996). This leaves the communication aspect of the application unused, or duplicated in their email, as users are still required to use email to take care of other communication. We were directed toward a number of empirical studies that indicated the same thing, and because of this we decided to take all versions of a "forum" out of our final design.

Whittaker, S., & Sidner, C. (1996, April). Email overload: exploring personal information management of email. In *Proceedings of the SIGCHI conference on Human factors in computing systems* (pp. 276-283). ACM.


1
I want a website for my research lab!
Prof X
2
Sign Up to Create Your Site
This looks like perfect site!
3
ENTER YOUR INFO:
Name/Title:
Upload Picture: Choose File
LAB Name:
LAB Desc.:
Upload Publications: (PDF) Upload File
4
Create an application for those interested in the Lab.
Your Application will already ask for Name, Major, Comments, and upload resume forms. Enter More here:
Field Name:
Field Name:
Field Name:
5
Cool, Now I have a public page and an online application for my lab!
6
I want to join Prof. X's Lab. I'm going to apply through his new website!
Ambitious Annie
7
Ancient Language Lab
Apply
Prof X
Prof X likes cake He also likes Ancient languages.
There's the Apply Button!
8
Application
Please Include all fields
Name: AmbitiousAnnie
Major: Linguistics
Comments: I like cake too. And ancient languages.
Upload Resume: resume.pdf
Submit
Awesome! That was easy. I'm glad I can send my application digitally to the prof. instead of through email.


9
All A New applications!
My Dashboard
My Projects
Prof X
10
Ancient Language Labs
Prof X
Ambitious Annie
-linguistics Major
Comments:
I like Cake too.
And Ancient language
Resume.pdf
ACCEPT
DENY
Annie is the perfect RA candidate. I'll accept her!
11
Sweet! I was just notified I'm part of the lab I can't wait to get my first Assignment!
Ambitious Annie
12
Y! I want you to expand your research on Ancient Chinese Syntax. Please use our new website to organize this. It's easy to use, and I gave you permission to create Projects.
Awesome! I'll get that up and running so I can make use of our RAs
Prof X
Grad Student Y
13
Ok. The Project is up. Now let me invite Annie.
Chinese Lang Project
Project files:
Project Members
Timeline
14
Project Invite
Accept
Decline
Sweet! My first Assignment
Project
Files
Members
3 New Member Annie
15
Now that I have an RA, I'll Assign her a task.


1. **Inspection**

For the usability evaluations we used Nielsen's heuristics to parse apart how our website needed improvement. We decided to use this instead of cognitive walkthrough because we have done evaluations using Nielsen's heuristics in class before, and felt like we were closer to experts on that for of critique. When we decided to do heuristic evaluation, we searched for heuristics that would be useful for our product: a website. We found other website specific heuristics but they contained significant amount of information that was not directly applicable to our project. We decided that Nielsen's was more appropriate.

After each of us doing a heuristic evaluation we discussed what we have found.

- High priority fixings were typos, formatting and descriptions on the website.
- Medium priority fixings were creating confirmation boxes to avoid accidental deletions, "Edit" buttons to enable the edition of labs/projects/tasks created by the users and "Success" dialogue boxes to inform users of successful uploads and creation of forms.
- Low priority fixes included proper input field lengths and merging the professor profile creation from two step to one step (which was an issue because of the framework we used, Web2Py).

None of those were changes in basic functionality and requirements, they were all improving the functionality and refining it. After the evaluation we proceeded to fix almost all of them.

**Wireframes**

We used a program called Axure to design the wireframe for our website. It is a program which is used specifically for designing websites. It is also a $400 program which is available to students for free, so we decided to use this project as an opportunity to learn this wireframing utility. We are very content with the outcome of using the program, as it helped us efficiently get an idea of how we would have to structure our site in order for it to function properly.

We chose to design the website in the way we did to make the important parts of the site easily and readily accessible. Our website has access to user Profile, Search, My Labs and Help on the top of every single page of the website because we felt like those were the most crucial parts of the site, and the user can get to every part of the site within three or four clicks at most. As far as colors go, we chose to have the website background be a neutral color of gray to make the overall site easy on the eyes. Links to the professor's sites are colored deep blue because it makes it easy to recognize those words as links. We chose very clashing colors (purple, yellow and green) for tasks, projects, and labs (respectively) to distinctively separate them from each other.

***Method***.

We chose to do an online approach so we decided to split our experiment into 2 separate studies.

Our first study was completed to test Professors and Graduate Students and the second study was based to test Undergraduate students. We decided to go this route because we are testing different things in both experiments.

Professors and Grad Students were either split into Group LabRAT or Group Standard. Group LabRAT used our system and Group Standard used the standard way they normally would complete the tasks. For Prof/Grad test, we gave them instructions in which Professors and Graduate Students first had to take a had to create their own webpage with an About me page, a page that describes the focus of their lab, and a page that briefly describes a current project in the lab. After completing the tasks, Prof/Grads were required to take Post-tests based on the system they used to complete the tasks. The tasks given are to browse through a list of Professors and their Research Labs using our system, LabRat. Then read through information that is listed on these pages and find a lab that you are interested in being a Research Assistant for. Apply for the RA position.

***Users.*** List their details (age, gender, experience with similar system, domain expertise, etc.).

**USER TESTING**

| Participant Code | Participants | Status | Group Type | Pre-Test? | Post-Test? | Email Sent? |
|---|---|---|---|---|---|---|
| 10 | Steve Whittaker | Professor | LabRat | | | yes |
| 11 | Christy Byrd | Professor | LabRat | Taken | Taken | yes |
| 12 | Faye Crosby | Professor | LabRat | Taken | | yes |
| 13 | Alan Kawamoto | Professor | Standard | | | yes |
| 14 | Bryan Holbrook | Graduate | Standard | | | yes |
| 15 | Christy Starr | Graduate | LabRat | Taken | Taken | yes |

| | | | | | | |
|---|---|---|---|---|---|---|
| 16 | Artie Konrad | Graduate | LabRat | Taken | Taken | yes |
| 17 | Barrett Anderson | Graduate | Standard | | | yes |
| | | | | | | |
| 1 | Karthik Thota | Undergraduate | LabRat | Taken | Taken | yes |
| 2 | Natalia Quinteros | Undergraduate | LabRat | Taken | Taken | yes |
| 3 | Sanusha Bijj | Undergraduate | Standard | Taken | Taken | yes |
| 4 | Swathi Balaji | Undergraduate | Standard | Taken | Taken | yes |
| 5 | Harika Adivikolanu | Undergraduate | LabRat | Taken | Taken | yes |
| 6 | Sanjuktha Sandeep | Undergraduate | LabRat | Taken | Taken | yes |
| 7 | Raina Ahuja | Undergraduate | Standard | Taken | Taken | yes |
| 8 | Meghana Ponna | Undergraduate | Standard | | | yes |
| 9 | Linda Armstrong | Undergraduate | Standard | | | yes |
| 10 | Evelyn Alvarez | Undergraduate | Standard | | | yes |

| |
|---|
| Christy Byrd: Professor, Female, Intermediate Experience in Web Development |
| Faye Crosby: Professor, Female, No Experience in Web Development |
| Christy Starr: Graduate, Female, Little experience in Web Development |
| Artie Konrad: Graduate, Male, Moderate experience in Web Development |
| Karthik Thota: Undergrad, Male, Research Assistant, Computer Science Major |
| Natalia Quinteros: Undergrad, Female, Econ Major |
| Sanusha Bijj: Undergrad, Female, Bioengineering Major |
| Swathi Balaji: Undergrad, Female, Bioengineering Major |
| Harika Adivikolanu: Undergrad, Female, Digital Media and Animation major |
| Sanjuktha Sandeep: Undergrad, Female, Computer Science major |
| Raina Ahuja: Undergrad, Female, Computer Science major |

***Testing setup.*** We did the testing online so we could give users flexible hours to work on the tasks. Professors and Grad Students were either split into Group LabRAT or Group Standard. Group LabRAT used our system and Group Standard used the standard way they normally would complete the tasks. For Prof/Grad test, we gave them instructions in which Professors and Graduate Students first had to take a had to create their own webpage with an About me page, a page that describes the focus of their lab, and a page that briefly describes a current project in the lab. After completing the tasks, Prof/Grads were required to take Post-tests based on the system they used to

complete the tasks. The tasks given are to browse through a list of Professors and their Research Labs using our system, LabRat. Then read through information that is listed on these pages and find a lab that you are interested in being a Research Assistant for. Apply for the RA position. Our variables for the Prof/Grad experiment included the same as our variables in the undergrad experiment included: Independent-- UCSC Psych faculty website Dependent-- Time and Happiness afterwards.

Here are the surveys in which open-ended questions and close-ended questions (using Likert scale) were asked:

Pre-test (Undergrad)
https://www.surveymonkey.com/s/ZFLD36R
Post-Test (Undergrad)
https://www.surveymonkey.com/s/ZFPYZQ3
LabRat Post-Test (Undergrad)
https://www.surveymonkey.com/s/ZGHPCPW
Standard Post-Test (Undergrad)
https://www.surveymonkey.com/s/ZB7NCW8

Pre-Test (Grad/Prof)
https://www.surveymonkey.com/s/Z3TVFJL

| Ugrad | Group LabRAT | Group Standard |
|---|---|---|
| Mean | 3.7197 | 2.8867 |
| Median | 4 | 1 |
| Mode | 5 | 1 |
| SD | 1.1876 | 1.2608 |

Post-Test (Grad/Prof)
https://www.surveymonkey.com/s/Z3FGJ5S
LabRat Post-Test (Grad/Prof)
https://www.surveymonkey.com/s/ZBQ9FB7
Standard Post-Test (Grad/Prof)
https://www.surveymonkey.com/s/ZBF9C9B

***Analysis.*** How you analyzed the data (mean/median/mode? Standard deviation/quartiles? Qualitative data analysis? T-test/ANOVA?).

## Quantitative Data

Undergrads

**P value and statistical significance:**

The two-tailed P value equals 0.5249

By conventional criteria, this difference is considered to be statistically significant.

**Confidence interval:**

The mean of Group One minus Group Two equals 0.9050

95% confidence interval of this difference: From -1.1165 to 2.9265

**Intermediate values used in calculations:**

t = 1.0586

df = 7

standard error of difference = 0.855

We had a high rate of attrition, with many participants not completing the study and so, could not complete a table for Prof/Grad. All participants that completed our instructions were in the LabRat group but the participants who did not complete the survey were in the standard group and so we cannot compute statistics between the two.

**Qualitative Data:**

Undergrads

7/7 Participants rated that LabRAT was easy to use to find professors.

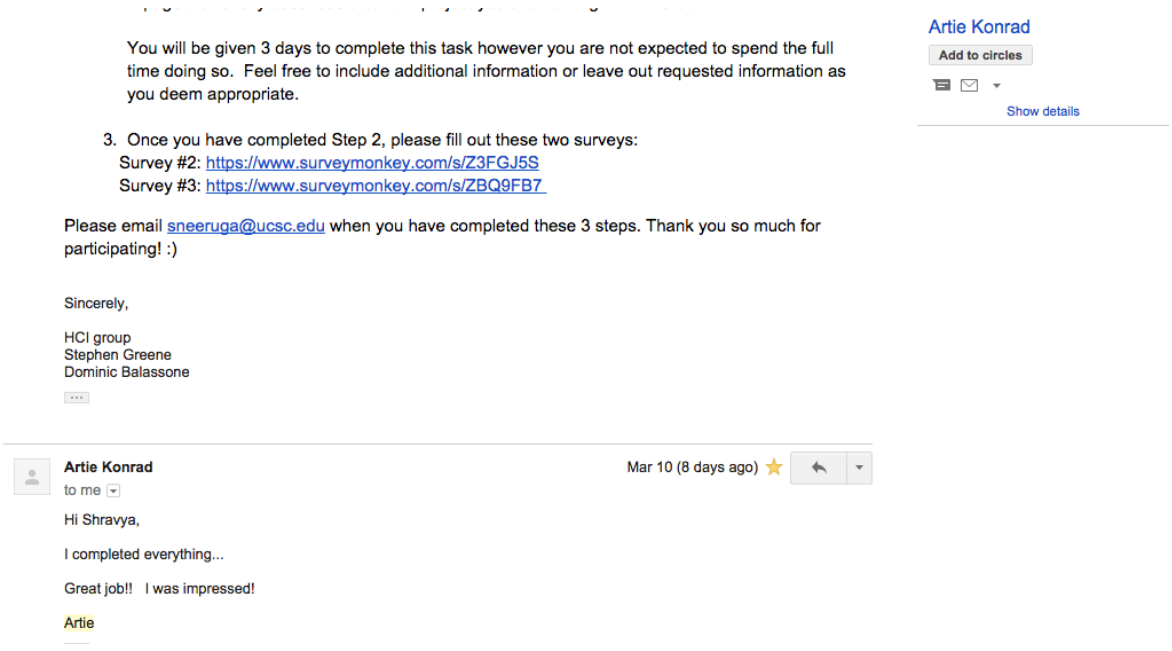
7/7 Participants also rated LabRAT easy to apply to labs

Grad/Prof

All participants said they contact their labs through email.

Most participants said they have intermediate to no experience in Web Development

***Results.*** A major limitation influencing conclusions that can be drawn is participation rate. It is important why the participants that did not complete the study did so and this will be explored in the future. Those that did complete the study found that LabRat was simple and easy to use but should definitely be more aesthetically pleasing because the colors are dull and ugly. Undergraduates found it easy to use when applying to a lab and finding Professors. Professors and Grad Students found it simple to use to upload their bio and research. The only concern was the interface colors itself which is a simple fix. Interface colors are very important because if the website is not pleasing to the eye, people are less willing to use it. Some color testing can be done and we can pick the best colors for our website and incorporate them in a matter of minutes.



You will be given 3 days to complete this task however you are not expected to spend the full time doing so. Feel free to include additional information or leave out requested information as you deem appropriate.

3. Once you have completed Step 2, please fill out these two surveys:
   Survey #2: https://www.surveymonkey.com/s/Z3FGJ5S
   Survey #3: https://www.surveymonkey.com/s/ZBQ9FB7

Please email sneeruga@ucsc.edu when you have completed these 3 steps. Thank you so much for participating! :)

Sincerely,

HCI group
Stephen Greene
Dominic Balassone

Artie Konrad
Add to circles
Show details

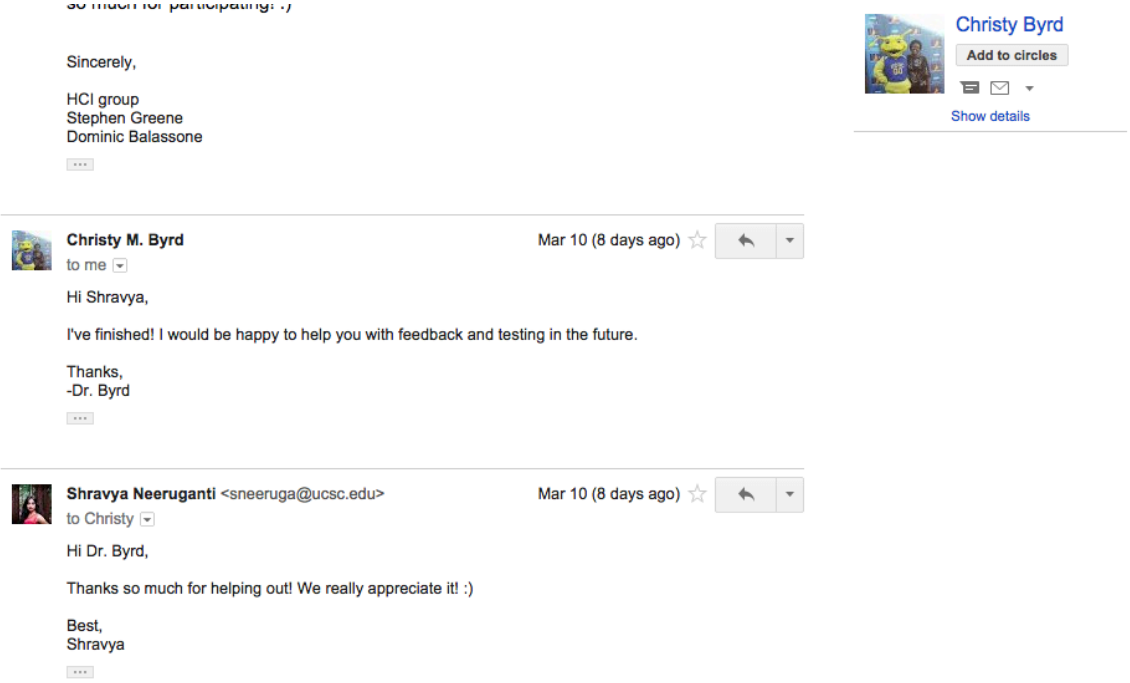
Artie Konrad
to me
Mar 10 (8 days ago)

Hi Shravya,

I completed everything...

Great job!! I was impressed!

Artie




## 1. FINAL VERSION

For the heuristic evaluation we had our high fidelity prototype done in Web2Py to go through and evaluate. As explained in the heuristics evaluation section, we identified several problems that we divided by priorities and fixed them. From this, we obtained an improved version that would be the final version to present in class and for the users to evaluate. The main differences that can be found in the final version are improvements in the flow of the website: edit and back buttons as well as formatting and descriptions that were changed and adapted. In fact, the back buttons were completely dropped for a different system, one which uses clickable titles instead. One important aspect that we also added to our last version is giving feedback to the user through "successful upload" messages and error prevention through confirmation boxes to avoid accidental deletions. This feedback is crucial when in comes to users' ease of use for the website, making each submission a little more solid in the users view when made. Finally, one main change that can be appreciated right away is the color schematic matching the hierarchy of labs, projects and tasks. Each level has a color that is accumulated and displayed on the sides of the website to indicate the user in which level he or she is.

There are several things that we would change if we had time. The major change we need to make before our system is ready to aid professors in a way that will make the task system better to use is the timeline feature. We included a placeholder for it in the final system, using the vis.js library, but we had trouble connecting it to our databases created through Web2Py. We are still investigating a work around for this, but it may involve remaking the databases from scratch. The layout could use an overall tune-up, with more colors to differentiate where the use is in the site, and making it a little more pretty and easy on the eyes. As

mentioned before, the professor creation process is two steps, limited by our framework, which should be a single, easy step for users (the fewer clicks, the better in this case). One small thing we would change is adding the ability for professors to choose an already made school from a list instead of entering it on their own. This leads to confusion as to what format they should enter the information, such as whether to abbreviate or not, as well as backend issues with database naming.

With these in mind, future iterations should be ready to launch to many professors at once so they can start managing their labs all from one website.

All of our main requirements were filled, which includes having a professor generate a webpage for themselves when creating an account, creating a searchable database of professor profiles, including a lab application integrated into the page, as well as a lab management system underneath that. We also added the ability for professors to offload the lab management to another member of their lab, a feature requested by many we interviewed.

In summary, using the different types of system evaluation and user testing techniques at different stages of development heavily shaped our final product. It was the use of these techniques that allowed us to make meaningful changes to the design of our product, all of which where skills learned in the class, and using storyboarding and wireframing to refine our ideas, and heuristic evaluation to refine it even further once we had a prototype ready, it has shown us how important is is to perfect our design before actually trying to make something too detailed. This realization saved us a lot of time and allowed us to focus on what the user really wants instead of what we think they want. We learned the importance of using user focused evaluation to inform every design decision in order to ensure we were moving in the correct direction, not merely moving and calling it improvement.