ResearchWeb

IPRO 321
Project Plan

Anandha Abhay
Zachary Cornelius
Tom Corsus
Maximilian De Courten-Myers
Adam Eberlin
James Kapaldo
Bethany Nicholson
Yuriy Sizyuk
Stephen Sundberg

Advisor: Robert Ellis

IPRO It takes a team!
INTERPROFESSIONAL PROJECTS PROGRAM

Team Roster

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Team Information

Robert Ellis – Team Advisor

Anandha (Matt) Abhay – Team Leader

Anandha is a 4th year Computer Science and Math Education student. He has experience with multiple programming languages and various development strategies. He also has some corporate and start up experience. He hopes to learn more about programming in Ruby and rails development as well as developing his leadership skills. He expects this IPRO to work as a cohesive unit throughout the semester and he expects the team to rally together to create a fully functioning prototype to present on IPRO day.

Zachary Cornelius – Vice Team Leader

Zach is a 4th year Electrical and Computer Engineering major. He hopes to contribute his knowledge of backend programming and hardware management to the team. From the project he would like to develop his leadership abilities, experience a professional environment, and learn more about website management. He also looks forward to learning how to lead a team of developers to a shared goal. He expects the team to research and develop a well-made final product.

Tom Corsus

Tom is a 3rd year Humanities major with a focus on Philosophy. He has extensive formal writing experience as well as strengths in editing and assessing aesthetics. He hopes to gain teamwork and professional experience from this project. He also looks forward to learning more about website usability. From this IPRO he expects to develop an understanding of what it means to work professionally in a well-organized team.

Maximilian De Courten-Myers

Max is a 4th year Computer Science student. He has prior experience in SQL Table and view design. In addition, he has an understanding of controls and models. He plans on learning more about SQL, JAVA, C++, Perl, PHP, Haskell, and CakePHP and how they can be applied to website development through this project. Overall he thinks that the team will produce a great product and hopes to have a good teamwork experience.

Adam Eberlin

Adam is a 3rd year Computer Science Student. He has experience in software engineering and web design. He also has knowledge of graphic design. He hopes to learn more about team collaboration and user interface design from this project while developing his communication skills and proficiency in Ruby. He expects this IPRO to deliver a valuable research asset through solid, responsible teamwork.

James Kapaldo

James is a 3rd year physics major. He hopes to contribute his understanding and experience of working in active research facilities. He hopes to gain additional understanding of the workplace environment as well as an increased understanding of academic research. He expects that working with his team will lead to an effective and fruitful IPRO project.

Bethany Nicholson

Bethany is a 3rd year Chemical Engineering major. She brings her organizational skill and punctuality to the team as well as a non-computer science perspective. She hopes to develop her leadership and communication abilities and learn more about website development. She thinks that the team will be able to create a site that will make research accessible to more people.

Yuriy Sizyuk

Yuriy is a 3rd year physics major. He has problem solving experience that he can contribute to the project. He hopes to gain a useful tool for his research at the end of this project. He is pessimistic about the outcome of the IPRO project.

Stephen Sundburg

Stephen is a 4th year Computer Science student. He has experience with PHP and MySQL. From this project he hopes to further develop his knowledge of PHP and learn more about CSS and other scripting languages. He expects this IPRO team to successfully bring separately developed modules together in a functional prototype.

Team Identity

ResearchWeb

"Taking the search out of research"

Team Purpose and Objectives

Team Purpose

ResearchWeb is meant to broaden IIT undergraduate participation beyond the existing mechanisms such as fellowships, research and reading courses, and departmental projects. There is also the possibility of broadening this program to other scholarly individuals outside of the IIT undergraduate community. These individuals include IIT graduate students, students from other universities, and promising high school students. ResearchWeb is also meant to improve the transition, and perhaps promote if need be, the transition from undergraduate education to graduate education. This would be fulfilled through practical research experience.

Objectives

1. Create a simple, functional open source product.
2. Create a strong and effective team environment.
3. Conduct adequate research to fulfill user requirements.

Background

Sponsor

This project does not have an official sponsor aside from the faculty adviser, Robert Ellis, and the IPRO office.

User Problems

There are four main problems for undergraduate students wishing to conduct research.

- Undergraduates do not know how to approach the research process.
- Research opportunities are not made readily available to undergraduates.
- Undergraduates have difficulties getting their research disseminated.
- Undergraduates do not have adequate resources for collaboration amongst their peers or professors.

Solutions

The ideal solution to the problem is a website with several components.

- A research area linking to research projects, sorted by topic.
- Links to profiles of researchers and the projects they are involved with.
- An online forum to facilitate discussion between researchers, as well as real-time, web based communications such as instant messaging and email.

Historical Success or Failure

There do not appear to have been any prior attempts at creating a fully interactive online community for undergraduate research. However, there are some resources for publishing undergraduate research with support for making comments such as the Journal of Young Investigators (http://www.jyi.org/), sites for posting open problems and posting solutions such as the Open Problem Garden (http://garden.irmacs.sfu.ca/), and sites with general information for conducting undergraduate research such as A Research Guide (http://www.aresearchguide.com/).

Other sites which allow users to post and respond to research but lack the sort of functionality we would aim for include:

- Caltech Undergraduate Research Journal (http://www.curj.caltech.edu/)
- Yahoo! Research (http://research.yahoo.com/)
- Google Research (http://research.google.com/)
- Furman University Electronic Journal of Undergraduate Mathematics (http://math.furman.edu/~mwoodard/fuejum/content/toc.html/)

Ethical Issues

There are many ethical issues involved with creating a research website for students. Any website that allows user uploaded materials has the threat of submitted viruses or inappropriate media. Additionally it is possible that user submitted research could be stolen or falsified. We would need to ensure the security of any personal user information. There could also be a threat of users impersonating other researchers. User-user harassment could become an issue if any sort of discussion or chat system is implemented on the website. Licensing and patent ownership could become a major problem informal or anonymous collaboration stemming from a forum or idle chat. It is a social ethical issue to consider people whose native language is not English and disabled persons when developing the website.

Business or Societal Costs

Businesses researching the same projects individually, or individuals researching independently, are wasting time and effort. Without a central location for research there is no knowing what will be published next, and careers are often contingent on original research. Without a website geared towards collaboration businesses could be throwing away money on research already conducted. Further, national needs, such as for Computer Science and Math majors, could be assuaged by providing a forum for organized, collaborative research.

Previous Attempts

An attempt to solve this problem was conducted during the summer of 2009. ResearchWeb was implemented using a customizable MediaWiki. The project was able to provide a framework for sharing and discussing research, but without the desired flexibility and potential for expansion. Further, the previous format has issues with collaboration and media integration. (See the external document for the prototype developed in the *ResearchWeb Final Report*)

Team Values Statement

Behaviors expected of each team member:

- All members are to be punctual. (deadlines and meetings)
- All members are expected to attend all meetings. Any time conflicts are to be settled with affected team members 24 hours prior of the meeting.
- All members are required to show respect to everyone involved in the project.
- All members are expected to work 8-9 quality hours outside of class each week.
- Any member with too much/too little work is expected to contact their team leader as soon as possible.
- Any member who finds they are not able to complete a task due to outside causes (tests, family Anandhaers, etc.) is expected to contact their team leader as soon as possible.

Conflict Management:

1. All conflicts should first be dealt amongst the involved parties.
2. Conflicts not resolved in this manner should be brought up to the sub-team/ team leader for mediation.
3. Conflicts not brought to a consensus by above methods are to be resolved by either whole team vote (majority wins), or ultimately by the project advisor.
4. Conflicts involving injury (physical, harassment, or plagiarism, etc.) will be referred to a higher campus authority.

Methodology

Process

The team will be developing this software using a modified agile development model. The process will follow Kent Beck's "The Agile Manifesto." Agile development was chosen because it allows the team to adapt to change quickly, allows rapid and effective communication between teammates, forces productivity through rapid prototyping, and allows for concise communication with the stakeholders.

To communicate quickly and effectively, the team will be working in sprints with status updates every class meeting during a scrum. This will allow the team to figure out the project's "velocity" and get strong estimates on what can be done in a timely manner. Preliminary research will allow us to narrow down the features that are absolutely essential. After we have an idea of what should be included we will be able start building a site and generating content. User input will be collected throughout the semester to make sure that we are on the right track. Once a basic prototype is ready, extensive usability testing will be conducted.

Major Tasks

The first task the team will undertake is finding out what research looks like and what features would be useful to researchers on an online website. This will be done by reviewing existing research focused sites, interviewing and surveying professors and students.

The next task the team will focus on is building a prototype. This task entails narrowing down on key features and deciding on a layout for the site. The team will be divided into two subgroups. The programming group will work on designing and building a site with the agreed upon features. The marketing and research group will work on content generation for the site as well as writing help guides for the various site features.

Once a functional prototype is up and running and has passed preliminary usability testing conducted by the team, we will set up a more extensive set of usability testing sessions. From these sessions we hope to learn what features need to be refined and perhaps what features need to be added.

After usability testing the programmers will go back and refine the prototype based on our findings. The marketing and research group will start looking into ways of generating the extensive user community that will be needed to make this site a success.

Mile Stones

Mile Stone	Number of Members Needed	Estimated Hours
Basic Requirements Charted	9	2
1st Prototype	5	20+
Internal Alpha	9	Unknown
Open Beta	9	Unknown
Beginning Advertising Campaign	4	20+
85% Acceptance Testing	4	20+
85% Unit Testing	5	15+
IPRO Day Presentation	9	Unknown

Solution Testing

The site will be tested extensively for usability by the team and members of the IIT community. Surveys will also be conducted to ensure that the features we include are features potential users value.

Analysis of Solution

The ResearchWeb prototype will be considered successful project if it can score above 85% when the team performs acceptance testing. The tests themselves are designed to test behavior, easy of use, and stability. The tests will be created as the prototype is built for continuous integration testing.

Documentation of Solution

The programming group will follow good programming practice when creating the site. This includes extensive commenting of the code they write. The solution will also be documented through members' personal project journals and logbooks as well as in informal reports on survey findings and our usability testing results.

Reasonable Amount of Time

We feel confident that we will be able to complete all of the major tasks mentioned above in the time we have. Completing all tasks will require prioritizing the features we would like to include on the site and may lead to omitting or diminishing some of the low priority features. We expect this IPRO to be continued in the Spring of 2010 and feel

that by completing the tasks above we will be starting the next team off with an exceptional prototype and a strong basis for further development.

Timeline

ID	Task Name	Aug 2009 ||||||| Sep 2009																														
		25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1	Project Plan																																					
2	Midterm Review Preparation																																					
3	Ethics Reflective Report																																					
4	Final Project Report (Draft)																																					
5	Abstract/Brochure																																					
6	Poster																																					
7	Final Presentation																																					
8	Final Project Report (Final)																																					

ID	Task Name	Oct 2009																														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
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ID	Task Name	Nov 2009																													Dec 2009			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4
1	Project Plan																																		
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ID	Task Name	Start	Finish	Duration	Sep 2009						Oct 2009				Nov 2009				Dec 2009	
					8/23	8/30	9/6	9/13	9/20	9/27	10/4	10/11	10/18	10/25	11/1	11/8	11/15	11/22	11/29	12/6
1	Internal Alpha	8/25/2009	9/29/2009	26d																
2	Open Beta	9/30/2009	12/4/2009	48d																
3	Advertising	9/30/2009	12/4/2009	48d																
4	Usability Survey	9/30/2009	12/4/2009	48d																
5	Rapid Prototyping	9/10/2009	12/22/2009	74d																
6	UI Development/Design	9/10/2009	12/22/2009	74d																
7	Requirement Analysis	8/27/2009	12/11/2009	77d																
8	Collaboration Research	9/8/2009	10/23/2009	34d																
9	Researcher Interviews	9/8/2009	9/15/2009	6d																
10	Mock Content Generation	9/10/2009	12/22/2009	74d																

Team Structure
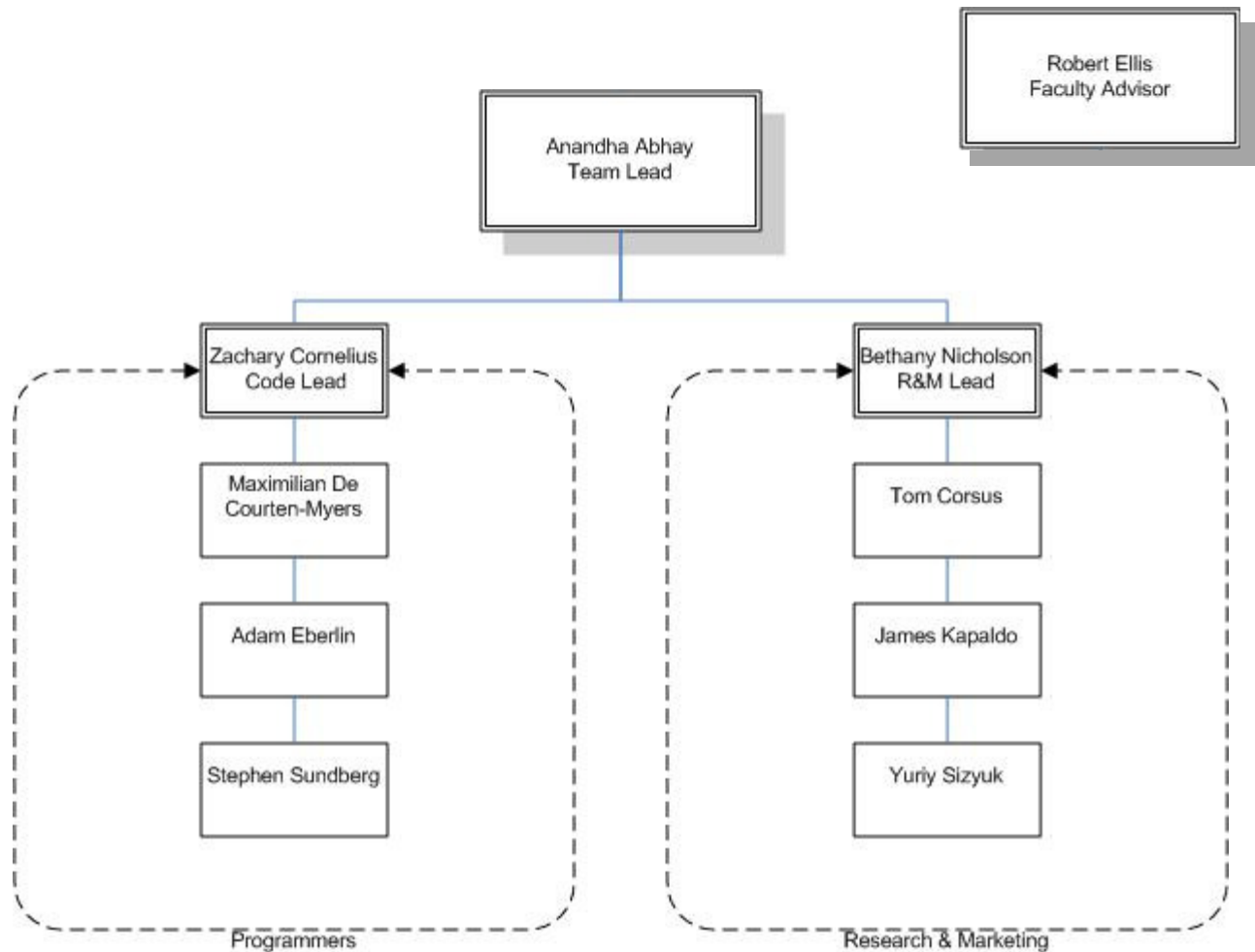
Team Leader

Anandha Abhay will be leading the team this semester. As team leader he has agreed fulfill the following duties to the best of his ability:
1. The team leader will be the primary discussion arbiter and ensure tasks and deliverables are accomplished well, and on time.
2. The team leader shall prioritize team leadership functions over self-assigned tasks.
3. The team leader will delegate, monitor, and verify completion of responsibilities amongst team subgroups and/or individual members.
4. The team leader will ensure efficient coordination between subgroups.
5. The team leader will obtain approval for class agendas from the team's advisor.

In the event that our team leader is unable to fulfill these duties, we have elected a vice team leader who will assume them. Our vice team leader is Zach Cornelius.

Sub-Team Leaders

The sub-team leaders will be responsible for dividing up large tasks assigned by the team leader among the members of the sub-team. They will also be responsible for reporting the progress of the sub-team to the team leader and the rest of the team when needed. The sub-team leaders will work closely with the team leader to ensure that the entire team is working toward a shared goal.

Programming Team

The role of this team is to handle all code-related aspects of the ResearchWeb prototype. This includes coding the user interface and backend of the deployable product, performing any necessary server maintenance, and creating testing suites for the usability testing. It is important to note that this team will not be solely responsible for the user friendliness of the user interface, or the aesthetics.

Research and Marketing Team

The initial role of this team is to develop a clear understanding of what research collaboration looks like and what features would be the most useful on an online site. As the site is developed the team will be responsible for generating content or mock data, to use on the site as well as acting as the liaison between the IIT community and the programming team when usability testing begins. This team will be working closely with the Programming team to create the user interface and to ensure the final product is something researchers will want to use.

Expected Results

Expected Activities

- Programming
- Marketing
- Research
- Layout Design
- Usability Testing

Expected Data

- Survey of interest with undergraduates and faculty
- Research into target audience
- Results of usability testing

Potential Products

A document outlining requested features will be constructed after the research is conducted. This could also lead to a few mockups with desired components from the target audience.

Potential Output

Programming modules will be produced at each step of the process. Research documents including users' desired features and intended design will also be produced.

Expected Results

- Survey results from the M&R team regarding website concept and features
- One or more potential layouts of the website
- Functional prototype of the website from the programming team
- Mock data to give an idea of what the fully operational website would look like

Potential Risks

There are a few risks associated with this project. The project may fail to reach critical mass in finding a target audience. There is also a risk of legal trouble if a user were to submit stolen research. Some of the challenges will be finding out what the target audience wants, constructing a useable website that meets the requirements, and generating an initial user base for the project.

Expected Results Incorporation

We expect to generate research that will give us an idea of what features are desired, which will be used as guidelines for the development of the site. We also expect to generate the site itself, as well as prototypes.

Project Budget

Item	Description	Cost
Survey Incentives	Money for gift cards/food to secure volunteers for usability testing	$200
Software Licensing	Money to attain licensing for software modules potentially implemented	$200
Server Costs	Costs to buy or maintain server	$100
Reference Material	Books and research materials	$100

Designation of Roles

Role	Tasks	Assigned To
Team Leader	Lead team discussion, assign tasks	Anandha Abhay
Vice Team Leader	Adopt Team Leader roles in case of absence	Zach Cornelius
Programming Sub-Team Leader	Communicate sub-team's progress to team/team leader, lead sub-team discussion	Zach Cornelius
Marketing and Research Sub-Team Leader	Communicate sub-team's progress to team/team leader, lead sub-team discussion	Bethany Nicholson
Meeting Recorder	Record decisions and discussions made at meetings and post them to iGroups in a timely fashion	Bethany Nicholson
Agenda Maker	Plan the agenda for each group meeting and gain approval from the team advisor	Anandha Abhay
Deliverables Chief Editor	Proof-read deliverables and edit for readability and content	Tom Corsus
Deliverables Compliance Officer	Ensure deliverables fulfill all guidelines set forth by the IPRO office and IIT	Anandha Abhay
Moderator	Moderate the iGroups account to keep it organized	Anandha Abhay