2011

Illinois Institute of Technology

IPRO

[IPRO 363: LANGUAGE LINK PROJECT PLAN]

January 28th, 2011

TABLE OF CONTENTS

I. TEAM CHARTER

1. Team Information

***IPRO Instructor* – Laura Batson**

***Project Leader* - Monica Samelson** - MBB - msamelson@gmail.com - 602.309.0823
Strengths: Linguistics background, strong language-learning experience, task-oriented
Looking to develop: Programming and website design skills, teamwork

Ashanti Balouki - CS - abalouki@iit.edu - [redacted]
Strengths: HTML designing, Java programming, research
Looking to develop: Leadership and people skills

Jacob Cole - PHYS/CS - jcole5@iit.edu - [redacted]
Strengths: Programming skills, time management.
Looking to develop: Teamwork, website development.

Simon Freedman - PHYS - simfreed@gmail.com- [redacted]
Strengths: programming, algorithms, solution-oriented mentality
Looking to develop: Algorithm development skills, programming skills.

Ian Hook - ARCH - ihook716@gmail.com - [redacted]
Strengths: Time management, hardworking, task oriented.
Looking to develop: Teamwork, presentation skills.

Erik Johnson - PSYC – ejohns15@iit.edu - [redacted]
Strengths: People skills, psychology background, positive attitude
Looking to develop: Teamwork, time management

Colin Johnston - CHEM - nephilxk@gmail.com - [redacted]
Strengths: Good analytical skills
Looking to develop: Teamwork and time management skills

Mitchell Miller - PHYS - mitch.miller08@gmail.com - [redacted]
Strengths: Task management, programming experience, time management.
Looking to develop: Programming abilities, teamwork.

Michael Ou - CS - mou1@iit.edu - sumgai89@gmail.com [redacted]
Strengths: Programming skills, time management.
Looking to develop: Teamwork, website development.

Dilyana Stoyanova - ARCH - dssarchitecture@gmail.com - [redacted]
Strengths: language experience, organizational skills, task-oriented, communication skills
Looking to develop: programming abilities, teamwork

Nattasha Vinas - BIOL - chumakchalo@gmail.com - [redacted]
Strengths: communication skills, writing scientific and professional papers
Looking to develop: teamwork abilities

2. Team Purpose and Objectives

The mission of IPRO 363 - Language Link is to develop a social network website that connects IIT students to learn languages, integrate cultures and build friendships. The basis for this solution is an online framework allowing students to build a personal profile, matching people based on common interests, goals, schedules, and other factors, so as to promote and improve language learning via natural every-day interaction and use of languages. The envisioned efficacy of Language Link is based on the theory of immersion, which is widely regarded as the best way to learn a language[1]. As the developers of the website, we will provide a matching system based on pairing algorithms in order to allow each user to build a relationship with a student most equipped to facilitate language learning, so that the immersion process can really begin. Language Link will not be designed to equip users with lessons, translations or vocabulary; rather, the site is envisioned as a social networking site connecting those that are interested in teaching, learning and studying languages. We plan to start off providing this service to IIT affiliates. As the project progresses we hope to extend Language Link to other city colleges as well.

Objectives:

Spring 2011 Semester:

- Write and format full site map and web content
- Secure server space
- Write code for and design home page, log-in page, profile pages, logo, and legal script
- Build and thoroughly test matching algorithms
- Promote the project, keeping constant contacts with relevant individuals and organizations, including international and study abroad centers
- Facilitate student testing of site and prototypes
- Complete full prototype - with registration and matching features - for IPRO Day

Fall 2011 semester:

- Expand of website prototype from previous semester
- Final test of website, addition of final features, and implementation at IIT
- Continue work on upgrading the website and maintenance on the website
- Research on extending the website to other schools and universities
- Consider finding a corporate sponsor and transitioning from IPRO to EnPRO

3. Background

The resources at many universities, especially IIT's campus, are not sufficient to meet the language learning needs of students. Sixty-eight percent of subjects surveyed felt "strongly" or "very strongly" that their university should provide more opportunities and resources for learning languages[0]. At IIT, international and ESL students complain that they have insufficient language resources to participate effectively in other English-based classes.

Furthermore, the opportunities provided by IIT's extensive international base are missed when the students among the communities do not have proper resources for interacting with each other. The solution devised by the IPRO team is a social networking website that builds connections among users and provides an online framework to facilitate communication between compatible language learners. Because Language Link will connect people based on a wide variety of user characteristics (e.g., native languages, target languages, location, class schedules, topic interests) it has the potential to cater to a very diverse user base. The ultimate aim of this project is to enable users to realize language-learning goals by being matched with the people most likely to help them effectively.

Secondary goals that are no less cherished by the IPRO team relate more closely to the social networking aspect of the website. The IIT campus offers a uniquely and magnificently varied population and this IPRO hopes to facilitate continued and expanded interaction between students of varying cultures and backgrounds. The IPRO team believes that the social benefits of learning a new language, or refreshing language skills, with a partner are innumerable.

The difficulty experienced by adults attempting to learn a new language has always been a problem, resulting in frustration, failure or surrender. There have been several 'magical' methods to aid in teaching people languages, but none have ever been as successful as immersing oneself in the desired culture and language. Currently some of the more common methods for learning a new language include Rosetta Stone (and similar programs), taking classes and reading textbooks, and the use of online resources. Rosetta Stone makes many grandiose claims about how powerful the program is, but there is very little hard data as to how effective it really is. A recent study indicates that 55 hours of Spanish with Rosetta Stone is equivalent to an entire semester of a 3 credit hour course at a university. Rosetta Stone is significantly less expensive than an entire semester at a university, offering estimated savings of around $2000[2]. Despite these significant savings, Rosetta Stone still costs almost $700 for a full curriculum.

There have also been many free, online resources available for amateur linguists, but none are very effective. Wikitranslate is a service that allows a user to post a passage in a given language for another user that is fluent in the desired language to translate. This tool is not very effective for a user that does not already know a language, since the object is not full-scale language learning, but only used as a utility.

From this research, the IPRO 363 - Language Link originated as an IPRO397 idea, and the work on the project began then in the Fall 2010 semester. At that point the as-of-yet-incomplete team wrote and conducted a survey to gauge on-campus interest in the Language Link service, along with conducting extensive research on language-learning and the kind of work involved in coding for a project such as this. The information gather in the fall of 2010 was recorded diligently and is being used productively in this semester.

The Language Link project calls for the concerted cooperation of IPRO students that know coding languages, along with students that are capable of designing a website as an effective

language learning tool, with a high level of flexibility between the two groups. As a result, the technological relevance of the project ranges from extensive computer science knowledge and application to psychological and sociological research of language learning to website design. The team is varied and informed, and has demonstrated so far its ability to accomplish these things with great success.

In regard to ethical issues, this project faces only a few problems, primarily relating to user privacy. As with any database of user information, security is incredibly important. It is also very important that the caretakers of the information do not use it for personal gain. It is common practice for corporations to attempt to buy user data from websites in order to sell more of their product or service. There is also an added issue that arises from matching strangers and encouraging them to meet one another. It is important to do everything possible to avoid putting users in harm's way. Language Link sets out to protect the privacy and safety of users by guarding user information professionally and implementing user-feedback systems that allow rating mechanisms, so that users violating policies can be flagged and investigated.

4. Team Values Statement

As a team, our two core goals are to maintain good communication and good feedback. Information should flow freely between team members and be clear, succinct, and useful. This information should be provided via timely communication, whether it is via phone or e-mail. Team members are expected to attend all meetings on time and be prepared to participate. Last, but most importantly, team members must be prepared to accept and provide feedback regarding the performance of other team members. If a precedent of feedback and clear communication is utilized from the start, the team will be better off. Furthermore, as part of the feedback oriented team culture, problems should be discussed between members, then if necessary elevated to the level of team leaders and the IPRO faculty mentor.

II. PROJECT METHODOLOGY

1. Work Breakdown Structure

Problem-Solving Plans and Processes:

The Language Link team will initially set up a Web framework open to IIT students. This Web framework will work like a social networking website. Targeted users are those interested in learning or pruning additional languages, along with those wishing to help others study languages, join language study groups, or organize language social events. When users log onto this system they will be asked to create a profile and fill out sections such as name, age, location, languages known and fluency, languages desired and fluency, schedule, and e-mail. This could also include other optional but preferred sections such as interests, goals, availability, and skills.

The site will then be capable of connecting the user to a list of others who will best match their profile criteria - based on common location, languages, age, etc - and then allowing the user to choose which match is preferred. After this initial link is completed, users can communicate via online chat, shared phone numbers, or email. The ultimate goal is to encourage users to meet in person in order to effectively apply immersion theory in learning their desired languages; productive activities can involve studying together, conversing, attending a social event, or a multitude of other interactions.

The first step of the process involved extensive research and was mostly completed in the closing weeks of the Fall 2010 semester. Research teams were divided into language learning and CS; these teams attempted to determine the best methods implementing the Language Link system. This included topics such as the layout design of the website, features, limitations, efficiency, how to encourage interaction, gauging IIT interest, and whatever other factors arise along the way.

In order to provide a user with specific match suggestions, we will have to develop a matching algorithm. The algorithm will be designed to match people, creating “language links” to build the social network in order to optimize the language learning potential of the members. This algorithm will be constructed by studying existing matching algorithms that match based on a number of characteristics, as well as analyzing the computational and sociological science of social networks, or, essentially, the study of the effects of connections between people[3-4].

The website will be designed with the constant thought that the goal is to facilitate language learning, and the team will make sure to factor what they learn about effective language learning techniques into the features and layout of the website. Analyzing this step would involve making sure the website is easy to navigate for users of multiple languages. It will also be possible to improve the website over time by feedback from students of different languages. Testing and analyzing this website will be accomplished by inputting real data from students, providing our own expected results for the test as to which students should be paired, and observing if the results of the matching algorithm agree with our expected results.

As this is the main feature of the language link system, a large amount of time should be spent in researching possible algorithms. We expect the algorithm development to be an iterative process; it is likely that even after it has been shown to pass tests, and is incorporated into the website, the matching algorithm itself will undergo changes based on feedback from actual users, and/or new ideas that the team has. Further testing can be completed by rigorous processes of debugging, cleaning, and securing code, in the final stages of the process.

Documentation will be completed by keeping detailed records of all research and data collected: surveys, user feedback, comments, and suggested improvements will be documented and kept for future use. The code will be documented in accordance to CS standards. In addition to this, the team's work and progress will also be documented, using the GANTT Chart and detailed weekly plans as a guide, to keep people on task and have record of individual responsibilities.

Ultimately, the website should not take very long to set up as most of the tools needed to construct one, such as a server machine (provided by IIT), database management tools (many free options) and web programming languages (many free options) are readily available[5]. The testing portion of the goal, where the website is refined by user feedback, is an iterative process and will extend as long as the website exists. Once the development of the website is complete, the team will begin testing with the help of interested IIT volunteers. This will be an on-going process that could continue for as long as the website is being used, constantly refining the layout and features available.

The major tasks involved in the implementation of the Language Link website as an IPRO beginning the semester of spring 2011 IPRO are listed below:

Project Team:

- Promoting the project and site
- Gathering and analyzing feedback from the prototype
- Completing IPRO Deliverables, including Midterm Presentation, Project Plan, and IPRO Day presentation and booth
- Working with international departments and groups at IIT in conjunction with their goals

Design Team:

- Researching language learning methods and observing/surveying people in web interactions to determine the best layout for the website and what the website will require
- Designing all website templates including home page, home page links, logo, profile pages, legal script, and "link" pages

Development Team:

- Researching graph and matching algorithms as well as SQL and other programming languages to implement the actual website itself
- Documentation of all the data collected, research, and code as well as progress and the team itself

- Gathering and writing all site content, including log-in and registration features as well as, most importantly, sophisticated matching algorithm
- Coding and implementing a prototype of the website
- Coding and implementing a finalized version of the website that is able to be opened to the public (next semester)

Team Structure (sub-team leaders in bold):

IPRO Team Leader: Monica Samelson

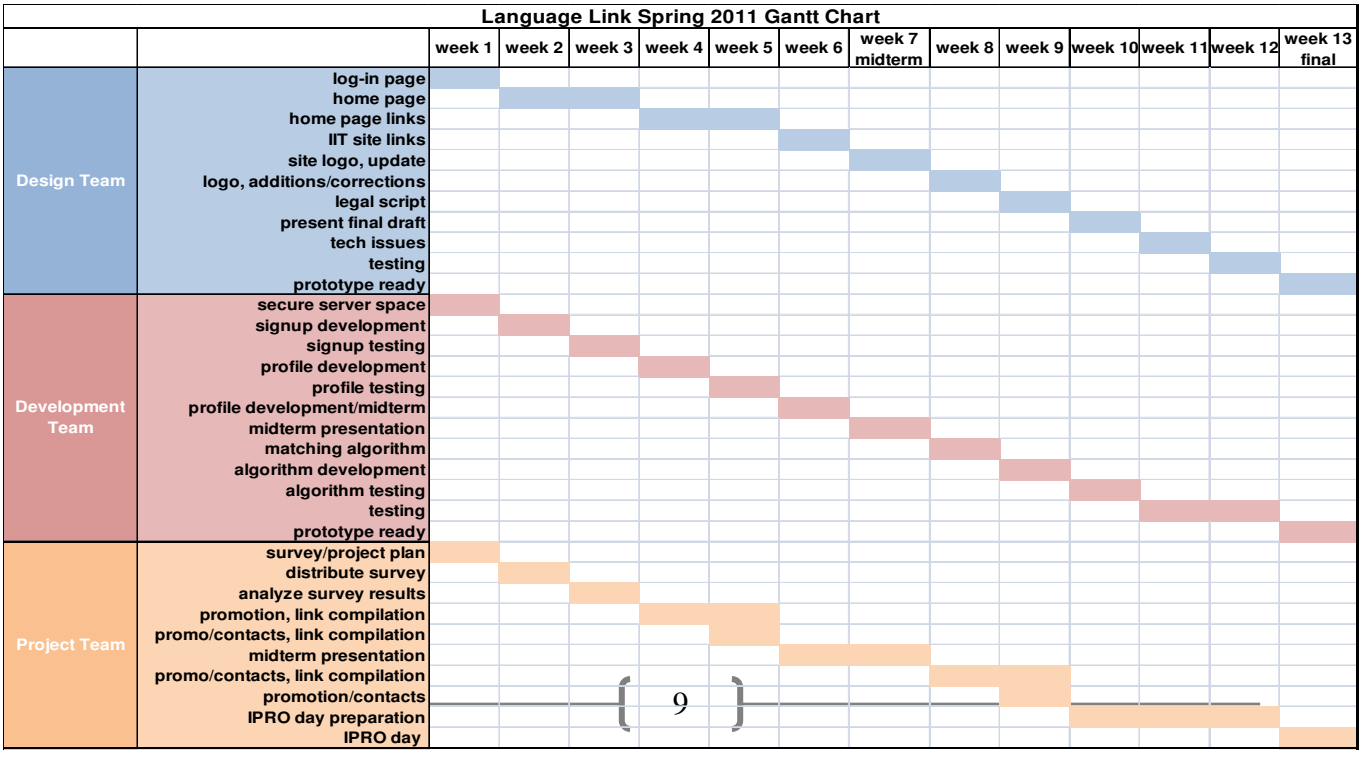
Subgroup 1 (Project Team): **Monica Samelson**, Nattasha Vinas, and Ian Hook.
Responsible for editing the project plan, dealing with the team's outside affiliates, editing and distributing surveys, promoting the project, doing necessary research, and otherwise completing administrative responsibilities.

Subgroup 2 (Design Team): **Erik Johnson**, Dilyana Stoyanova, and Ashanti Balouki, Colin Johnston.
Responsible for designing the team's posters and site based on research of website usability and aesthetics.

Subgroup 3 (Development Team): **Simon Freedman**, Michael Ou, Mitch Miller, and Jacob Cole.
Responsible for researching website building techniques and appropriate matching algorithms as well as building, coding, and maintaining the Language Link site.

Our team structure was created to maximize every team member's skills and to allow multiple areas of the project to be worked on simultaneously. The above subgroups are by no means exclusive and are meant to work in isolation as well as together.

Gantt Chart Work Breakdown



2. Expected Results

The Language Link team has devised a list of outcomes it will strive to accomplish as it designs and builds our website. The team plans to be testing our functional prototype site by the end of the semester to be sure it stands up to our expected outcomes as follows:

- Maximize access of individuals to assistance in the process of learning a language
- Maximize teaching of languages by promoting the ability to teach
- Minimize website obstructions
- Maximize student interactions at IIT
- Maximize cooperation and interaction between student groups
- Minimize social stigma of Internet interactions on campus
- Maximize socialization among IIT students of all cultures

The team will continue interacting with and getting feedback from potential Language Link users along with international departments and groups at IIT. It will establish what areas students could use the most help in (e.g. understanding certain languages, speaking certain languages, learning different cultures), how they prefer to interact through the site, and what we can do to encourage them to help others learn as well. In order to accomplish this, the team plans to conduct another survey and one or more focus groups so it can interact with potential users and hear feedback in person. In addition, the IPRO team expects to continue our research regarding the best practices of website development and social network design.

Once a prototype site has been completed it will be tested to make sure the team's desired results and outcomes are being accomplished. Students will be asked to give feedback and the site will be altered to reflect their opinions and needs. By the end of the semester the team aims to have a running prototype version of the site on IIT's servers available for testing by IIT students. This will bring us to the final stage of the semester in which the team will prepare a poster and presentation for IPRO day that displays our progress. Data will then be archived for future semesters so maximum development will continue.

Some challenges the team expects to encounter include getting enough students to participate in focus groups and test our prototype site, along with making the site stand out when compared to other Internet based language aids. Our site will need to accomplish what we want it to, but remain very user friendly, taking into account the cultural diversity of our users. It will also be a challenge to determine and develop the intricate pieces of developing a social networking site including the secure log-in, matching algorithms, and building profiles.

These expected results will be remembered throughout the project to keep the team on track and to ensure we complete the goals we have set in a timely manner. The team will also take into account the challenges expected to be faced to make sure they are overcome in reaching our final goal of a working site.

3. Project Budget

The current budget is primarily for materials needed for focus groups and prototype testing for the website. In addition, our budget includes publication of materials for IPRO Day and miscellaneous supplies. The website will be hosted on an OTS server at no cost. In the second semester there will be expenses regarding acquiring a domain name and hosting the website. These are dependent on the scale of the project (e.g., specific bandwidth requirements, number of testers) but are not expected to exceed $200/year (based on average prices of domain names and web hosting).

Budget Breakdown

Expense Category	Amount
Materials for Focus Groups and Prototype Testing	$ 300
Publication Materials for IPRO Day	$ 200
Miscellaneous Supplies and Food	$ 200
Total	**$ 700**

4. Designed Roles

Minute Taker: Simon Freedman
Agenda Maker: Monica Samelson
Time Keeper/Team Moderator: Erik Johnson
iGroups, Google Group, and Dropbox Moderator: Mitch Miller

III. REFERENCES

[0] Primary Source: Survey organized and conducted by IPRO 363 Team

[1] Immersion Education and Research. (n.d.). Retrieved from Center for Advanced Research on Language Acquisition, University of Minnesota website: http://www.carla.umn.edu/immersion/

[2] Gholdston, Havalah. "Hard Science on Rosetta Stone Effectiveness - TopTenREVIEWS." Rosetta Stone 2011 - TopTenREVIEWS. Web. 02 Dec. 2010. <http://rosetta-stone.toptenreviews.com/hard-science-on-rosetta-stone-effectiveness.html>

[3] Cormen, Thomas H.; Leiserson, Charles E.; Rivest, Ronald L.; Stein, Clifford (2009). Introduction to Algorithms (3rd ed.). MIT Press. ISBN 0-262-03384-4

[4] Boyd, Danah; Ellison, Nicole (2007). "Social Network Sites: Definition, History, and Scholarship". Journal of Computer-Mediated Communication 13 (1). http://jcmc.indiana.edu/vol13/issue1/boyd.ellison.html

[5] Silberschatz, Korth, Sudarshan; Database System Concepts 6th edition, (McGraw-Hill 2011)