

**IMPROVING CONNECTIVITY BETWEEN
MEMBERS AND ALUMNI OF ALPHA PI MU**

by

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Abstract

The purpose of this project was to solve the problems of a lack of connectivity between the current members and alumni of Alpha Pi Mu, as well as the lack of incentives for prospective members to join the club. These problems were solved by creating a website that allowed current members to be able to view the complete work experiences of alumni and provided a way to reach out to those alumni directly to network with them. The agile project management system was used to develop the website and helped to successfully complete all of our design requirements listed in the following report well and on time. After thorough user testing, the result of the project was a clean, user-friendly website that will help members of Alpha Pi Mu network with alumni for years to come.

Introduction

In the business world, connections play a huge role in the advancement of one's career. Whether you are a graduate fresh out of college looking for your first job, or a successful employee looking to progress your career, the people you know and the network you have built can have a huge impact on moving your career in a positive direction. As graduating seniors and leading officers of Alpha Pi Mu, the national industrial engineering honor society, we are constantly looking for ways to build our own personal networks while also building Alpha Pi Mu and increasing the benefits received by its members. As of now, there is a definite lack of connectivity between the graduates of APM in industry and the current members of the club, as well as a lack of incentives to persuade prospective members into joining. Therefore, the aim of our project is to create an online website to facilitate networking among the members and alumni of APM, and in doing so provide a service to our members that makes the club more marketable to potential new members.

Before actually beginning to build the prototype of our site, large amounts of research and design preparation had to be completed. To build off the information learned in Human Factors Engineering (IME 319), extensive research had to be completed on User Interface design and efficient process flow to best maximize the user friendliness of the site. We also spent time expanding our familiarity of database design, ASP.NET, and other material learned in Data Management and System Design (IME 312) to give ourselves a more complete background on the skills we would need to physically construct the site. Finally, we completed in-depth research on the concepts of the iterative agile project management approach and how it could be paired with the material learned in Project Organization and Management (IME 303) to create

the highest quality product. Using the agile project management approach, the projects solution was reached by following this list of steps:

- Create a Relational Database diagram
- Develop a storyboard of site including layout and functionality
- Re-visit the database diagram
- Conduct user feedback of storyboard
- Begin basic site construction
- Conduct user review of initial iteration
- Continue site construction with more complex functionality and improvements from user review
- Conduct final user review
- Complete final site
- Redevelop final process flow and storyboard of site
- Reach out to Alumni base for actual data
- Conduct analysis of completeness of site

The rest of the report is organized to provide background information related to networking, database and web design, user interface, and agile project management, as well as the design and methods we used to successfully complete our project. In addition, this report will include our site final site test results, related conclusions, and overall solution feedback.

Background & Literature Review

ALPHA PI MU

Alpha Pi Mu (APM), the only nationally accepted industrial engineering honor society, was founded in 1949 by nine students at Georgia Tech University. From the beginning, the goal was to create an organization through which outstanding students could share ideas and experiences to foster professional development. Chapters now exist in nearly every major university with an accredited industrial engineering program and Cal Poly's APM is one of over 50 active chapters. The mission and goals of APM are outlined on the national website, as follows:

1. The Mission of Alpha Pi Mu

- To confer recognition upon the industrial engineering student who has shown exceptional academic interests and abilities in his field.
- To encourage wherever possible any movement which will advance the best interest of industrial engineering education.
- To further unify the student body of the Industrial Engineering Department in presenting its needs and ideals to the faculty.
- To create a closer student-faculty relationship by bringing together the needs and thoughts of both.
- To assist and cooperate with all organizations and persons working for the interest of industrial engineering.
- To benefit its members by the association and experience that can come from bringing together a group with similar interests, objectives, and abilities.
- To promote the professional welfare of all.

2. The Goals of Alpha Pi Mu

- Recognize top junior and senior industrial engineering students for their academic achievements

- Increase professional development among members
- Promote networking among faculty, graduate, and undergraduate students
- Have fun!

APM was started at Cal Poly in 1972 while serving the core mission of the national honor society, Cal Poly's chapter has acted as a resource to all students of the Industrial and Manufacturing Engineering Department. While the club has gone through periods of inactivity since its conception, officers of the past two years (academic years 2013-2014 and 2014-2015) have been working to develop a lasting structure for the chapter to ease year-to-year transitions and encourage the chapter to remain active.

A key part of establishing APM at Cal Poly is recruiting new members to keep the membership constant, if not increasing. APM eligibility constraints are set by the national foundation; Membership is offered to Industrial Engineering undergraduate students in the top 1/5th of the junior class or top 1/3rd of the senior class and graduate students in the top 1/2th of their class. This means the total club membership is constrained based on total enrollment in the Industrial Engineering program at Cal Poly.

Ideally every student eligible for APM should want to join, but currently the club is not established enough with the power to convince everyone. A major aspect of the officers' effort in developing a strong structure for APM is making it a club that everyone wants to join without question. In achieving this goal, projects and activities include a combination of social events, service opportunities and developing industry connections. One of the big gaps Cal Poly's APM currently faces is a lack of contact and communication with APM alumni. Bridging this gap would be very beneficial in a few ways - providing a means for exclusive professional

networking (alumni to alumni and alumni to current students), developing mentorship relationships and opening up potential fundraising opportunities through industry relationships.

This is where the project of the subject of this paper comes in. In brainstorming how to address this gap between APM and alumni, a solution was ideated to create a networking database of APM alumni and their professional experience. The database should be accessible and appropriately manipulable by any APM club member or alumnus via a user-friendly website. Development and deployment of this database and the connected forward-facing website are the two key objectives of this senior project.

BENEFITS OF PROFESSIONAL NETWORKING

While the term “networking” can sometimes come across as a transparent or selfish means of self-promotion, this project supports the view of networking as a positive means of developing mutually beneficial professional relationships and friendships. Successful networking requires a positive mindset, and maintaining the connections, contacts and friendships developed in college can have a long-term impact on a student’s career after graduation (Addams).

While opportunities to network exist all over, especially at universities, students do not take advantage of them as often as they should. In the article *Developing Leadership Skills in College and Early Career Positions*, authors Larry Boone and Monica Peborde state that professional contacts “help provide valuable support, feedback, insight, information and resources. Individuals who recognize the importance of networking move beyond their functional capabilities and continue on the path toward successful leadership.” Beyond establishing professional contacts, it is equally important to maintain one’s networks. Boone and

Peborde also note that “reaching out to the individuals in your network, even when you do not require help or information, allows you to maintain the contacts and further build your relationships.” This is an area where students and young professionals really struggle. When given many opportunities to meet people from a variety of industries and backgrounds through university-led events, it’s easy to take advantage of the networking opportunities, but following up with all these new contacts requires intrinsic motivation and an understanding of the concept of future-minded networking that students have often not yet developed.

The Industrial engineering program at Cal Poly aims to develop student leaders. There are five fundamental leadership skills that have been widely recognized by experts in the leadership field: 1) establishing credibility, 2) managing time, 3) being proactive, 4) empowering others to act, and 5) networking (Boone). While faculty can do their best to teach skills and create experiences to foster leadership development, it is up to students to take advantage of this while also seeking other opportunities to work on their leadership skills. Alpha Pi Mu is becoming a great vehicle for student members to develop leadership skills, and a networking database website will be an extremely beneficial addition.

DEVELOPING A SOCIAL NETWORK ONLINE

As large-scale social networks are increasing in popularity, companies, academic institutions and non-profit organizations are looking to develop customized interactive applications to incorporate social networking into their existing online systems. They hope that interactive social elements will encourage more involvement with and contribution to the site. Small businesses, academic institutions, non-profits and startup companies don’t have the capital to purchase existing commercially licensed social networking software or outsource custom

development, but they still want to embrace the power of social networking at a lower cost (Wang).

Cal Poly's Alpha Pi Mu is a perfect example of a small non-profit hoping to leverage its customers (members) desire to interact and connect with one another to further the purpose of the organization. With an exclusive and custom online social network, members of Alpha Pi Mu can connect with one another and with alumni members of the club to make and maintain professional contacts. The club does not have the capital to pay for a commercial software license or have the application custom-developed by professional consultants. The senior project of this paper will provide the club with the application and capabilities APM needs without having to incur any major costs.

While off-the shelf open source social networking software exists that can set-up a functional website in minutes, a great deal of customization and enhancements must be incorporated to create something specific to the target audience. To ensure a final product that aligns with their unique expectations, an organization needs to carefully analyze the business objectives of the site and develop a list of system functionalities and information requirements in order to achieve the goals (Wang). It will be important to work closely with APM and its expectations before finalizing system design for the web application to be developed.

DATABASE PROGRAMMING

The first step after designing the table and relationship structure for the database for this project is selection of the software package through which the database will be created and saved. There are three categories of database software: commercial enterprise software, personal database software, and open source software. In the business world, common commercial

packages include Oracle, IBM's DB2, Microsoft's SQL Server, and more. Two leading personal database programs are Microsoft Access and Filemaker Pro. Open source software is free and developed by individuals as opposed to corporations; MYSQL, the most popular free database software, is not exactly open source, but can be used without charge for non-commercial applications (Denton).

In comparing all of these options, key criteria to consider are cost, ease of use, functionality and compatibility. Most expensive are the commercial platforms, with purchase prices running at thousands of dollars, not including cost of supporting hardware requirements. Personal software packages are a much more reasonable option, with a single license for Microsoft Access costing around \$100, with student and bulk discounts available. Of course even cheaper yet are the open source options, with no cost of purchase and free support materials available. When looking at ease of use, personal database software, especially MS Access, has the advantage, as it runs in a recognizable MS Office environment, while commercial packages are much more complicated to use and MYSQL runs best on Linux operating systems which is not as familiar as the more common MS Windows. All of the options discussed here have the necessary basic functionality required to perform basic database queries and updates. Commercial platforms contain vastly more functionality than the other options discussed, but for the project of the subject of this report, only basic functionality is required. For the purposes of this report, compatibility with web application frameworks is very important. As will be discussed next, the two options for web development engines are ASP.NET (Active Server Page) and PHP (Hypertext Preprocessor). Microsoft Access is a good fit for Microsoft's ASP.NET, while MYSQL works well with PHP (Denton).

After reviewing the options, based on the criteria and our previous experience, the personal database management software, Microsoft Access, comes out on top. Cal Poly already owns the software, it is intuitive to use with the necessary functionality, works well with Microsoft's web framework, and we have a lot of experience using the program already.

WEB DEVELOPMENT ENGINES

Once the database is designed, the remaining development of the APM networking website will need to be done through a web application development framework. While there are many options available, the two most popular environments with server-side scripting capabilities are considered for this project: ASP.NET and PHP. ASP.NET is Microsoft's framework, while PHP is an open-source platform. These two options are leaders in developing web applications with heavily dynamic web pages, using database queries to power site content (Liaw). Analysis of the pros and cons of both options was necessary to make a selection.

PHP is a server-side scripting language designed for web development. As an open source platform one of the major benefits of using PHP is cost, as it is free to use and has no licensing fee. Additionally PHP embeds easily into html pages and integrates well with other __. The efficient performance of PHP is another pro, there are no packages or GUIs and it's an interpreter language so it doesn't need to go into memory for compiling the code which makes response times faster (Singh). PHP is also easy to code in, requiring fewer lines of code to accomplish the same task in another web programming language (Liaw).

Microsoft's ASP.NET is a server-side web application framework designed for web development, especially to produce dynamic web pages. An expensive license (sometimes upwards of \$1,000) is required to use Microsoft's Visual Studio, which is the integrated

development engine (IDE) through which you code ASP.NET pages. However, despite its cost, Visual Studio is a powerful IDE that provides helpful tools through a good user interface for web development. ASP.NET is good for both small and large scale applications, as it's easy to scale up. In testing, another pro of ASP.NET is that application layers can be tested separately with unit testing (Singh).

After reviewing the pros and cons of each development engine, both PHP and ASP.NET would be great engines to use for this project. While cost is one of the biggest issues, and PHP is clearly cheaper, in this circumstance, Cal Poly has a license for Visual Studio so there would be no license cost to develop this project with either engine. Another factor influencing the decision is previous experience, and both team members have experience in ASP.NET, but none in PHP. Finally, as testing will be frequent in this Agile-managed project, with multiple development and testing iterations to work through, ASP.NET has a better framework to implement MVC architecture with layers that can be tested separately. Therefore, the team decided that ASP.NET will be used to develop this project, coding in Microsoft's VB.NET through the Visual Studio IDE.

As mentioned above, developing the website with MVC architecture will be very helpful in testing. MVC is a powerful development model, allowing for high code reusability and adaptability, making it easy to scale applications up in complexity. MVC can be implemented in ASP.NET and PHP, but it is easier to do so in ASP.NET because the framework is more robust than PHP (Liu). MVC is a 3-layered architecture approach – Model, View, Controller:

1. Model (Business logic)

1. This layer represents core functionality and encapsulates data of application domain and all actions based on data operation.

2. View (Presentation)

1. This layer handles graphical tasks and generates output to display request data from the model.

3. Controller (Data access)

1. This layer interacts with model components by the message exchange to meet the request and the visual response of the view.

The APM Networking website will be designed using the MVC layers as a framework.

This will ensure ease of testing, design, and code changes. Additionally, the MVC design will be simple to pass along to future site developers, which is important for an application that will be used by an organization with year-to-year member and officer turnover.

USER INTERFACE DESIGN

When developing a new website, functionality and user experience has a huge effect on the success of the site. According to Uttara Nerukar, a senior research associate at Infosys Technologies, websites need to be designed from the ground up with the user in mind and focus solely on providing the user with the information they are looking for, not necessarily the information the developers of the site want to share with them. To achieve this, Nerukar highlights a specific 6-step web design methodology that helps to ensure the best possible user-centered web interface. First, the sites mission and vision need to be defined so that there is a clear understanding and overall plan for the goals and functionality of the site. Next, the intended audience needs to be defined and broken up into a finite number of user types that highlight the majority of the expected user base for the site. The specific tasks each user type is expected to perform and the information they would be interested in viewing then needs to be

defined. After that, the web page design begins and the page hierarchy and navigation paths are designed to easily map the tasks users are expected to perform with the information they are expected to be looking for. Finally, the labeling and search systems need to be designed so that it is optimized for the tasks and the final design needs to be tested. Taking this approach to web design will ensure a complete, user-centered experience that will ideally make the developing site as successful as possible.

How an individual web page is visually presented is another key aspect to consider when building a user-centered web site. In an article titled, “The Bull’s Eye: A Framework for Web Application User Interface Design Guidelines,” authors Beier and Vaughn discussed the lack of common user interface guidelines and presented a solution entitled, “The Bull’s-Eye.” The Bull’s-Eye represents a concentric circle of guidelines on what pieces of information belong where in the layout of a web page, each building on the next layer as one moves from the inside out. At the center of the page/bull’s eye where the eye is naturally drawn to, the specific component you want your user to primarily interact with is placed. As you move away from center, a page template should form around the center component, followed by a combination of templates to create page flows. Moving further out, the interaction pattern for the site should be created by combining page flows and the overall aesthetic design and features of the site should make up the rest of the page. This bull’s-eye approach helps to bridge the gap between other guidelines and standards and helps to create a common layout strategy for a wide range of users and application domains.

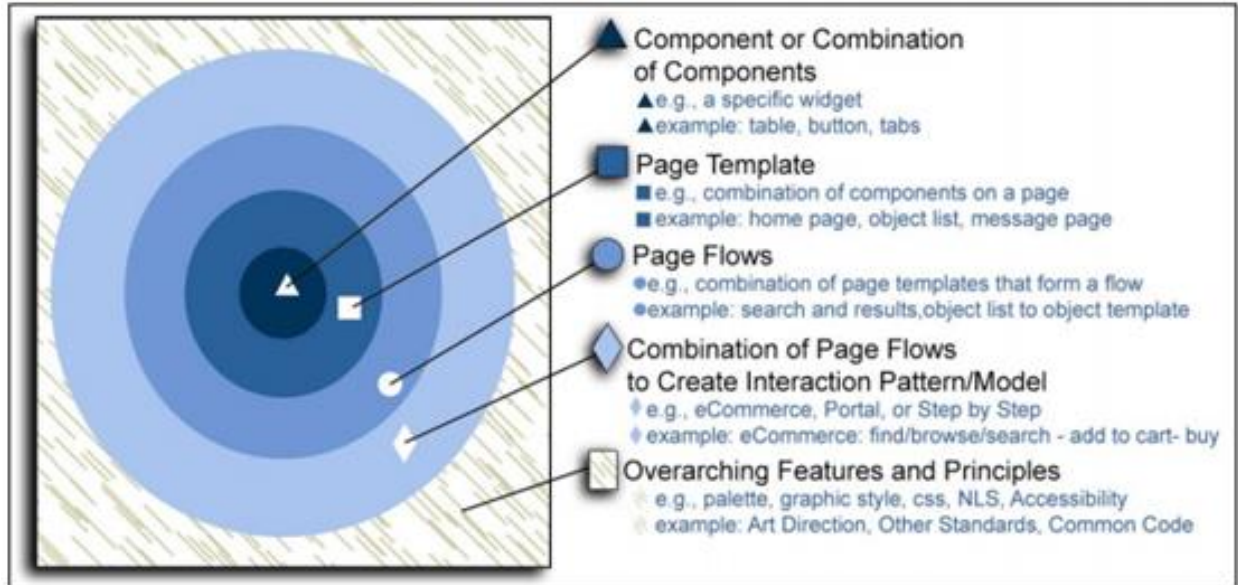


Figure 1: The bull's eye approach to user interface design

With the ever-increasing use of web applications as large sources of information and services, design quality and overall user experience have never been more important. Recently, the International Organization for Standardization has released ISO 25010, a new set of standards which specify and evaluate software and data quality requirements. In this set of standards, the concept of software quality has been broken down into 8 basic characteristics, as seen in the figure below (Lew). Incorporating all eight of these characteristics into the design of a web site/application ensures optimum quality and ideally helps to create the best user experience possible.

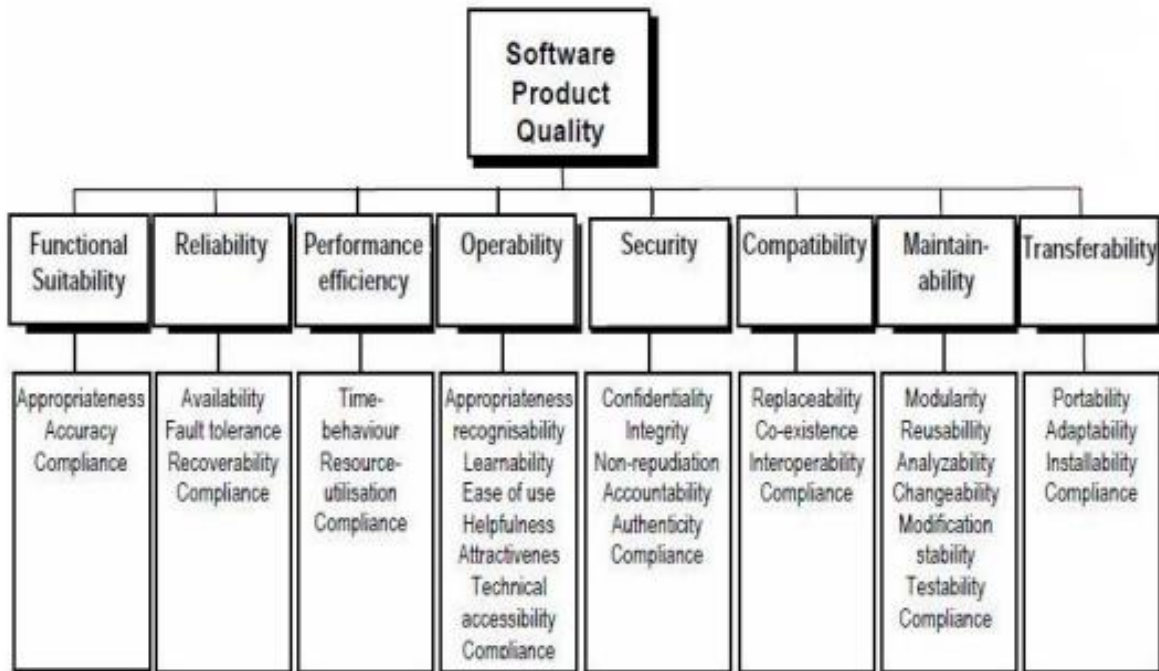


Figure 2: ISO 25010 Standards for software product quality

AGILE PROJECT MANAGEMENT

Before starting a web development project, a project plan and management approach must be established. Project management strategies can be divided into two general categories, traditional and newer “agile” or “lean” approaches. Traditional project management can be characterized as a linear or hierarchical approach, accomplishing tasks start-to-finish in a pre-planned order. Main benefits of the linear approach are that the entire project can be scheduled, there will be few scope change requests, and team members can be distributed. Comparatively, the Agile or lean approach is an iterative, adaptive, and collaborative model which features smaller deliverables that are deployed and tested throughout the design process. Structurally complex, uncertain, and heavily time-limited projects are better managed with an agile

approach. Agile was described by Glen Alleman as a “thought process with the following practices:

1. Think small incremental deliverables
2. Get the customer to have some skin in the game
3. Never have breakage - have continuous QA at every point through assurance process
4. State up front requirements are fluid - build the processes around fluid requirements

(Fernandez).

Agile project management originated as a methodology in the software development environment. However, due to its unique approach, the strategy is becoming increasingly popular in a variety of fields, like product design (Molhanec).

Characteristics of the APM networking website project lend well to an agile management approach. With a tight deadline, loosely defined functionality objectives, and easy access to future users for testing, designing and developing this project through iterations with frequent QA and testing will be an efficient way of creating the most complete and functional final product.

USER SURVEYING

Before a web site or application can be released to the public, it must be thoroughly tested and debugged. Testing a web site before is released for use ensures a quality site that doesn't break, works efficiently, and naturally builds a foundation of trust between the site and the user. In general, there are four types of testing that should be done before considering a site ready for release: functionality, user interface, security, and load. Users expect web pages and applications to function quickly, consistently, and correctly. Therefore it is imperative to do

things like checking to make sure all links are performing correctly and follow the right path, confirming that the database queries are built correctly so that there are no errors in the database when you edit or modify the page, and checking to make sure other functions like searching or file uploading perform as they are supposed to. On top of functioning correctly, a quality web site should have an appealing front-end experience for all users. Test to ensure the sites layout is clear and organized and can be used on a variety of different browsers. It is also imperative that the site is easy to use and that if anything does go wrong, the appropriate error messages are clear and helpful. Because most web sites and applications often store personal user information, it is incredibly important to thoroughly test the security of a web site before it can start capturing user data. A variety of automated web tools are available online that are designed to test and probe the security of a developing site. For more serious situations, a white-hat security expert can be consulted to ensure the site is secure. Finally, it is important to test to make sure that the site and its server environment works well regardless of how many users are trying to access it. Luckily, most web hosts offer the ability to scale up the amount of resources allocated to a specific site in order to handle spikes in traffic, and this should be considered when shopping for a host. Testing is a vital part in any web site development, and if these four types of testing are done, the site should perform successfully and completely.

An incredibly important aspect of web site development is the user surveying facet. According to an article by authors Gonzalez-Bañales and Adam entitled “Web Survey Design and Implementation: Best Practices for Empirical Research,” user survey design and implementation can be broken down into five main steps:

1. Planning the survey
2. Writing the survey

3. Designing the survey
4. Sending Invitations
5. Data Collection

When planning the survey, it is important to outline what needs to be tested, define the population of people that are going to complete the survey, and estimate the required sample size. Having a clear idea and objective for the survey makes the questions easier to determine. When writing the survey, the two key goals to keep in mind are minimizing measurement error and reducing non-response. Using as few answer types as possible and being consistent eases the burden of the respondent and minimizes the chances of misunderstanding and non-completion. When designing the survey it is important to be explicit (ie. give information on the objective of the survey, inform of the average completion time, etc.), be user-friendly and make the survey as easy to take as possible, and use pre-tests to discover potential problems and make improvements to ensure best possible results. When choosing specific people to physically take the survey and provide feedback, it is important to make sure they are similar to the demographic that is estimated to use your web site. To ensure the highest response rate, keep the message you send with the survey simple and concise and send the survey invitation on Tuesday, Wednesday, or Thursday in the second or third week of the month. Finally, collecting clean, up-to-date data in an efficient manner is the last step in user survey design and implementation. If after two or three weeks of the initial invitation to take the survey, it is absolutely okay to send a second notification to people who have not yet responded. Doing so will help maximize the number of responses and ensure the most complete and current information is being received.

Design

Before we started our project and began designing the website, we wanted to develop a concrete list of features we wanted our site to have. After brainstorming and meeting with our advisor, we came up with the following features that would be required of our final product:

1. **Login**- A way for different users to access our website and view/edit their personal information.
2. **Change Password**- Give the users the ability to change their password
3. **Add/Edit Personal Information**- A way for users to add or change information like their current location, email, and phone number.
4. **Add/Edit/Delete Internship or Job Experiences**- A way for the users to post and edit any work experience they have had to their account.
5. **Search**- Give the users the ability to search for other work experiences of members or alumni of Alpha Pi Mu using a company name, job location, or job title.
6. **Connect**- Allow users the ability to send emails to other members within the site.
7. **Member Map**- Use Google Maps and Google Places to visually show users where all other users are currently located around the world.
8. **Current Officers**- Allow users the ability to view the current officers of Alpha Pi Mu.
9. **Master User**- Set up a Master User that has the ability to edit the site and make the necessary changes to keep the site updated.

After deciding on a list of required features for our site, we began to develop the design of our database using Microsoft Access (Appendix Figure 1). We made sure that our table structures were set up in the first and second normal form and that foreign keys were used to link

all of the tables together. After the database design was decided on and to our liking, we began coming up with a design plan. Based on the finding of our literature review, we decided to use the Agile project management approach to building our site. To do this, we broke the development of our site up into three equally weighted iterations by dividing up the list of required features based on the estimated amount of time it would take to complete them (Appendix Figure 2). Once the plan was completed, we began work on the first iteration, developing the Login, My Account page, the ability to add/edit personal information, and the ability to add/edit work experiences (Appendix Figures 3, 4, 5, & 6). Again using the information we learned from our literature review on user interface, we designed these features with user experience in mind so that they were as easy and as clear to use as possible. Specifically for the add/edit personal information and work experience, we made the decision to take the user to a new page with just the information that they needed to make the experience less cluttered and more clear to use. Once all of the features in iteration 1 were completed, we began testing on that iteration before moving on to the next (see Methodology). We then took the feedback from the tests and made changes and edits to the first iteration to make it as complete and well-built as possible before beginning iteration 2.

After completing the first iteration and implementing the improvements learned from testing, we began iteration 2 by beginning the design of our work experience search functionality. The main goal of the search function was to allow users to be able to search by the location of job, the job title, and the company. To do this, we created “and/or” radio buttons and dropdown text boxes to make the search process as easy and intuitive as possible. Once the search function was developed and performing correctly, we began implementing the Connect function of our site. To make it as easy to connect with other users and possible, we had the

Connect feature appear on the results of a search, allowing users the ability to contact other users on details of an exact work experience (Appendix Figure 7). The Connect feature itself was designed so that users can directly send other users emails automatically through our site using the email address that they have saved in their personal information. Pulling the emails directly from the database rather than have users input them manually streamlines the connection process and makes it easier and faster for users to interact with one another (Appendix Figure 8). After implementing the Connect function, we began working on developing the Master User account so that we could give one specific user the ability to have complete control over the site. We first created a specific username and password to log in as the Master User, and then developed a page that allowed the Master User to view and edit the list of industry contacts, the complete list of users, and the list of the current officers of Alpha Pi Mu. This was simply done by creating three buttons allowing the user to view each of the above three lists, with another button appearing allowing for editing of the respective lists (Appendix Figure 9). To finish off iteration 2, we designed and built the functionality of being able to edit those lists (ie. industry contacts, users, and current officers). All of the editing functionality was implemented directly into the original Master User page, with text boxes appearing at the bottom of the page to edit the selected list. This allowed for the fastest and most user friendly editing experience possible, eliminating the need to load a new webpage. After completing iteration 2, we began user testing the iteration (see Methodology). We then took the feedback from the tests and made changes and edits to the second iteration to make it as complete and well-built as possible before beginning iteration 3.

After completing the second iteration and implementing the improvements learned from testing, we began iteration 3 by building the APM current officer page so that users can view and

connect with the officers of the club. We did this by pulling the information directly out of the database and displaying it on a webform for users to view. We also implemented the Connect feature into the page so that users can reach out directly to the officers of the club, helping to make it as easy as possible for alumni to stay in touch with the ongoing operations of the club. After implementing the current officers feature of the site, we began developing the last feature of iteration 3 and the project as whole by beginning the design of the Member Map feature. With the goal of the feature being to show the current location of every user in the site, we began by embedding Google Maps into our webform. Then using Javascript, we pulled the latitude and longitude coordinates off of every stored location in the database and displayed them on the map using the Google Map markers. To increase user friendliness, we added the names of the users at each location so that each location was labeled with the name of the corresponding user (Appendix Figure 10). After implementing the Member Map feature, we began our final round of user testing on iteration 3, and used the feedback from the test to make changes and edits to make the third iteration as complete and well-built as possible.

Methodology

After completing the plans for overall design of the website, the website was developed and coded using Microsoft Visual Studio in the ASP.NET environment. This software is available in the Cal Poly Industrial and Manufacturing Engineering Department's computer labs, so the development was completed in these labs. As described in the previous section, the development was completed in 3 iterations, each iteration adding to and improving the prototype website. User testing was incorporated at the end of each of the 3 iterations. These user tests were given to receive feedback on current features and functionality of the site and suggestions for improvements or additions. Testing setup and iteration specifics will be outlined next.

TESTING SETUP

All tests were given in a quiet room in building 192. Testers were sat down at a desk with a computer in front of them and given a synopsis of the senior project, the intended purpose of the website, and their role. The most current APM Connect site was open to the applicable page within the site in the web browser on the computer and a sheet of paper with instructions was on the desk next to the computer. After getting comfortable, testers were told to move through the website guided by the numbered instructions. Once they completed the instructions, testers were instructed to move to the second tab on the web browser, where a survey was open. Testers completed a survey of questions applying to the test just taken, and results were saved online to be reviewed by the project team later. For each iteration, testing was done in the afternoon, and testers were all college students in the age range of 19-25. While testing setup was consistent for each iteration, the subject matter tested varied, discussed below.

TESTING DETAILS

Iteration 1

The first iteration was tested by users on January 28th, 2015. At this point the login and account pages were set-up, with the ability to add and edit job and internship experiences. Testers worked through the following instruction sheet.

Instructions

1. Add an internship to your profile.
2. Edit that internship experience.
3. Add a job to your profile.
4. Edit that job experience.
5. Fill out this Google form:
https://docs.google.com/forms/d/1yxafskn8hGIlZP-FIwAA_MZWKuQBph8uV3X4IUcCifg/viewform?usp=send_form

Figure 3: Iteration 1 Testing Instructions

After completing the test, testers switched tabs in the browser to fill out the Google Form questionnaire, or used the link provided in the instructions. See Appendix B, Figure 1 for the complete survey questionnaire for Iteration 1. There were 7 testers for this iteration.

Iteration 2

The second iteration was tested by users on February 12th, 2015. At this point in development, the Search and Connect pages had been recently completed, so the iteration 2 test focused solely on these functionalities. Testers worked through the following instruction sheet after being given two parameters (for example, worked at Cisco and was a Supply Chain Intern) by which to search for a name in the database (the search page on APM connect allows users to search by up to three parameters). This name was given by the project member administering the test.

Instructions

1. Search for the suggested person.
2. Choose to connect with them.
3. Send them an email with
Subject: Hi, [insert their name]
6. Fill out this Google form:
https://docs.google.com/forms/d/1yAraHo9kll9rYpst6rYriziIgSG_uWy8MVS8BNNXELk/viewform?usp=send_form

Figure 4: Iteration 2 Testing Instructions

After completing the test, testers switched tabs in the browser to fill out the Google Form questionnaire, or used the link provided in the instructions. See Appendix B, Figure 2 for the complete survey questionnaire for Iteration 2. There were 5 testers for this iteration.

Iteration 3

The third and final iteration test was slightly different than the preceding two, as the testing was broken into three parts. At this point, all functionality was complete and able to be tested. Testing was completed on two dates, March 10th and March 13th, 2015. Testers were given only one of three instruction sheets, which the test administrator gave in a cycle (first tester receives test 1, second tester receives test 2, third tester receives test 3, repeat) with one tester working at a time.

The first test had the tester login as a normal user, tester1, and proceed to edit the information on the account page, use the member map page and go to the current officers page to use the connect function. The exact instructions are below. For question number 5, the instructions require the tester to write down a result; the purpose of this question was to test the user-friendliness of the member map page.

Test 1

1. Login with user Tester1 and password APM101
2. Edit your personal information
 - a. Change your (feel free to enter made-up, but realistic values)
3. Change your password
4. Find yourself on the map at the location you entered
5. What member lives in Chicago, IL?

6. Add a new internship to your account
 - a. Edit the job title of this internship
7. Send an email to the current APM Vice President

Figure 5: Iteration 3, Test 1 Testing Instructions

After completing this test, testers switched tabs in the browser to fill out the Google Form questionnaire for Test 1. See Appendix B, Figure 3 for the complete survey questionnaire for Iteration 3 Test 1. There were 4 testers for this test.

The second test had the tester login as a normal user, tester3, and proceed to use the search page to find and connect with other users. This test also includes editing information on the account page, and looking at the current officers page. The exact instructions are below. For questions 2, 3, 4, 5, and 7 the instructions require the tester to write down a result; this again was a way to test user-friendliness to see if it was possible for users to find the correct information.

Test 2

1. Login with user Tester3 and password APM103
2. Search to find who worked at Deloitte in Houston

3. Connect and send an email to the person who worked in Quality at Chevron

4. How many members have worked at Cisco?

5. How many members have worked in San Francisco?

6. Add a new job to your account
 - a. Edit the location of this job
7. Who is the current Secretary of APM?

Figure 6: Iteration 1, Test 2 Testing Instructions

After completing the test, testers switched tabs in the browser to fill out the Google Form questionnaire for Test 2. See Appendix B, Figure 4 for the complete survey questionnaire for Iteration 3 Test 2. There were 5 testers for this test.

The third test had the tester login as the Master User. This login has different abilities than a normal user, as the Master User administers the site, inputting Industry Contacts, new members, and managing officer positions. Testers performed each of these three functions using the instructions, below.

- Test 3
1. Login with username "masteruser" and password "apm123"
 2. Add a new Industry Contact
 - a. Edit that contact's name
 3. Enter a new member
 - a. Edit that member's email
 4. Add a new officer, "APM Connect Chair," held by Tester10
 - a. Change the APM Connect Chair officer to Tester11

Figure 7: Iteration 1, Test 3 Testing Instructions

After completing the test, testers switched tabs in the browser to fill out the Google Form questionnaire for Test 3. See Appendix B, Figure 5 for the complete survey questionnaire for Iteration 3 Test 3. There were 5 testers for this test.

Once all testing was completed, results were exported into excel for a review by the project team. After each iteration, the respective feedback was implemented into improvements, changes, or additions as suggested intelligently by testers. As the tests for this project were feedback focused, only a simple review of text responses was required for immediate interpretation and analysis by the project team. The questionnaire for iteration 1 featured 1-5 scale rating questions to assess certain functions and features. The responses to these questions were averaged for an overall interpretation, with subjective review of each individual response as well, since the number of responses is small.

Results & Discussion

TESTING RESULTS & DISCUSSION

As described in the previous section, the testing for APM Connect was done in three iterations. For analysis of results, each iteration is considered separately. Most, if not all analysis is subjective review, as the testing for this project was intended to provide quality feedback for improvements. Discussion includes steps taken as a result of feedback provided.

Iteration 1

The iteration 1 test and questionnaire featured the login function, editing personal information and adding and editing job and internship experiences. Testers were asked to rate the difficulty of 5 processes on a scale from 1 to 5 (less difficult to more difficult). The averages of testers' responses for each process are in the chart below.

Iteration 1 Test Result Averages						
Process	Login	Add/Edit Personal Information	Add a new internship experience	Add a new job experience	Edit original internship experience	Edit original job experience
Avg Score	1.3	1.8	3	2.6	2.7	2.2

Table 1: Iteration 1 User Testing Result Averages

Testers didn't have much difficulty with login or manipulating personal information. Adding a new internship was the most difficult, relative to the other processes, but even still this is only the halfway point on the scale 1-5. Tester experiences were quite varied for this test. This variance told the project team that improvements needed to be made to the add/edit internship/job processes. A big change was made due to this feedback. Instead of having the user move to a separate page each time they need to add or edit an experience, they

can now do it all on the account page. This eliminates navigation and confusion for users who are still getting used to the interface. Small issues with dates and inputs were also corrected.

Iteration 2

The iteration 2 test and questionnaire focused on the search function. Overall, testers liked the and/or toggle buttons and the option of having up to three search fields. They did not like that the page occasionally had to be refreshed to reset the search or toggle buttons. This test revealed an error when searching by job title. This was an error the project team did not encounter during initial testing, and proceeded to fix afterwards. No improvements were suggested, only one comment on the slowness of page load, which is determined by the server.

Iteration 3

The final iteration was broken into three tests, but the questionnaires have some overlap, so the results of all three tests will be discussed at once. The questionnaires featured only two question types: an open-ended feedback question, or a multiple choice ease of use question with the same options: Difficult, somewhat difficult/confusing, neutral, somewhat intuitive, very intuitive/easy.

The first question asked in all three tests was “How was the login process?” Testers found this overwhelmingly easy, with one somewhat intuitive and 13 very intuitive/easy responses. Another question asked in each of the three test, which was “How was overall site navigation?” Responses to this question were all neutral or better, with 4 neutral, 6 somewhat intuitive, and 4 very intuitive/easy. A third question asked on all tests was to provide feedback on the most difficult or confusing feature to use. There were many good suggestions that came

out of this question. One tester suggested implementing an FAQ or user guide page to the site to orient new users. This is something the project team didn't think of, but will definitely add in the future. Among other small suggestions and issues, testers gave very constructive feedback.

FUTURE STEPS

The development and functionality of APM Connect is complete, but there are some key future steps that must be completed to accomplish full deployment. These steps are outlined in the sections below.

Economic Analysis

As the website stands right now, there are no costs associated with it. APM connect is currently hosted on Dr. Yang's IME1 server, which provides storage space with an associated url link. While the benefits of having no costs and an easy place to store the website are nice, they come with some downsides. First, the server IME1 is often very heavily loaded with many students accessing it, causing major delays and occasional outages. Second, the url to type in is the exact location of the site stored on the server, which is nested within multiple folders, making it difficult to type in the url and get it correct. The solution to this is to move the website to be stored somewhere else. After a review of options, the best choice was determined to be Amazon's Web Services (AWS). Amazon offers cloud website hosting, with elastic service, only charging customers for the time they use, allowing that to be variable. As APM Connect won't be a heavily used site, this model means the club will not have to pay for any more time than it uses, no matter how low. Another great benefit of AWS is that the first year of service is free. This will be a great trial period. After that, costs are determined flexibly, by usage. Based on calculations and estimations of expected data in/out of the server and usage time, the monthly

cost for APM Connect to be hosted on AWS would not be more than \$10 per month, or \$120 per year. More likely, it would even be less than \$5 per month, or \$60 per year. If every APM member saves even just 1 hour of job searching and networking efforts by using APM Connect, and students value their time at \$9 per hour, with 50 members that's \$450 saved by members every year, much more than the annual cost of hosting the website.

Outreach

A big step of implementing APM Connect full scale is getting data. While all current APM members will be expected to input their intern and job experiences into the database, the goal is that the majority of data in the APM Connect database comes from APM Alumni members out in the working world. There are many APM Alumni out there who could be great contacts for the club itself and club members. To get these individual's information into the system will require an outreach effort. The email account for APM contains many old email addresses for Alumni members, which would be the first place to start in contacting the members. After contact however, another crucial aspect of the outreach effort is to present the website and data input request in such a way that makes it easy to do what is asked. The project team would hope that Alumni would be happy to help and join this site, but many APM members will not have ever felt a real association with the club itself, losing that motivational factor. Soon enough however, current members will become alumni, so the data will cycle in slowly at the very least.

Website Management

After implementation, there will be some manual management of the website that will need to be done regularly. It is the expectation of the project team that APM will add a new officer position to the club with the responsibility of managing APM Connect. This responsibility

includes inputting new APM members into the system, adding industry contacts as needed, editing officer positions as needed, and attending to any issues that arise as related to APM Connect.

Security

While APM Connect features a login function, which allows members to login to their page with a password, there are some security concerns for the website. The login is coded into the page-to-page navigation, displaying username in the url string. This opens the website up to the possibility of a malicious user typing in a url string with the information of another user to see their information. As the website increases in use, this security concern is something that will need to be addressed. A further project can be done to implement a new security login system with hidden information or another approach altogether.

Conclusion

In conclusion, the core problems of this project were the lack of connectivity between the graduates of APM in industry and the current members of the club, as well as a lack of incentives to persuade prospective members into joining. Therefore, the aim of the project was to create an online website to facilitate networking among the members and alumni of APM, and in doing so provide a service to the members that makes the club more marketable to potential new members. To do this, Microsoft's ASP.NET Framework and Visual Studios were used to create a website to help solve these two problems. After conducting literature reviews and before beginning design of our actual site, a list of objectives and features for the site were determined in order to make it as complete and user friendly as possible (see page 21).

With agile project management being the driving management style of the project, the requirements were broken down into three separate iterations, with each one being completed, tested, and re-completed before moving on to the next.

Aside from the completed website, the most important results received from the project were the testing data collected from the post iteration testing. This data allowed for improvements to the site to be made that were missed in the original design, making the website as complete as possible. These tests also provided insight into the web development field as a whole. As web developers that are actually building and creating a website, we tend to think like web developers rather than the users actually using the site. Things that seem trivial or simple might not be to the general demographic of the site users. Observing and testing the site with users with little to no web development experience allowed for observations on how people use and move through the site without our own creator's bias. These tests allowed us to make the site as easy and intuitive for the actual users as possible, rather than how it was thought it should be.

A lot of new and valuable things were learned through the planning, design, and completion of the project. The agile project management style is something that doesn't get touched on very heavily in Cal Poly's coursework and learning about it through literature reviews and using it to complete this project really helped to show the power and effectiveness it can have. Splitting the project into multiple iterations was also a valuable way to make the overall project seem more manageable and allowed for strong time management. Google Maps implementation and Javascript were also two huge things learned by completing this project. Javascript can be a very powerful tool when developing web applications and getting the opportunity to be exposed to it and use it was incredibly beneficial.

If the project were to be completed again, only a few things would need to be completed differently. First, a more specific problem statement with a more defined scope would be incredibly beneficial. With our current problem statement, it was very hard to prove that our project actually solved the problem we stated and actually increased connectivity with alumni and got people more excited to join the club. Redoing the project, a more specific problem statement would be the first thing that would need to be fixed. Secondly, coming up with scheduled times to work on the project in advance would've helped tremendously in keeping the project timeline in check. There were multiple times when labs were closed or doors were locked that prevented any work to be done on the project. If more planning had been done in advance, that problem could've easily been solved. Overall this project was a great learning experience, and provided huge amounts of insight into the web development field as a whole.

Appendix A – Design Figures

Figure 1: Database Design-Block Concept:

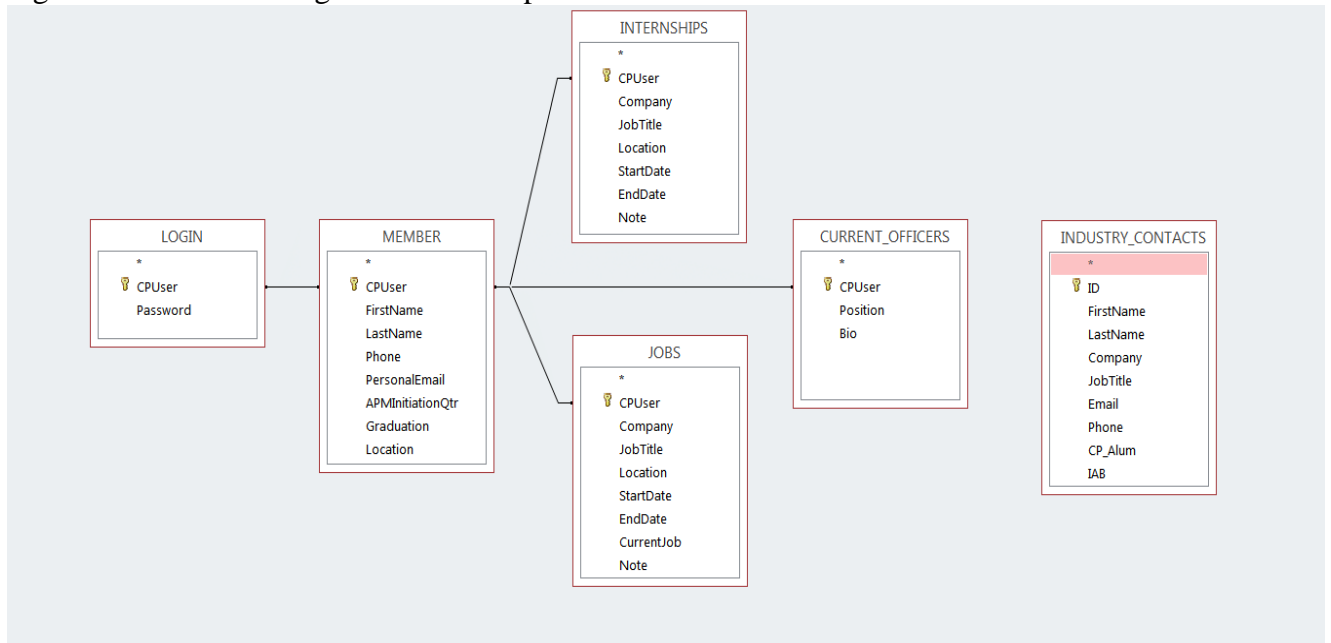


Figure 2: Agile Project Management Plan:

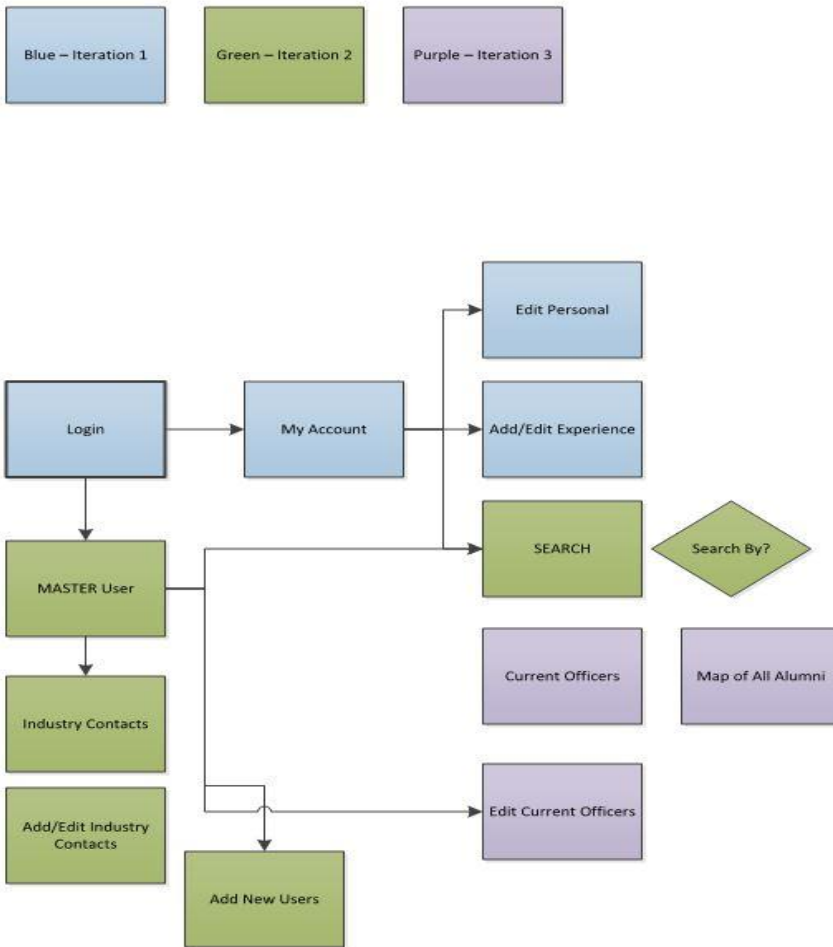


Figure 3: Login Page:



Welcome to Alpha Pi Mu Connect.
Please enter your username and password to enter.

Username:

Password:

Figure 4: My Account Page:

Cal Poly Alpha Pi Mu Connect

[My Account](#) | [Search](#) | [Member Map](#) | [Current Officers](#) | [Log Out](#)

Welcome, **Ben Buell**

Member Information

Initiation Date	Spring 2012
Cal Poly Graduation	Spring 2015
Current City	San Luis Obispo, CA, USA
Email	bpbuell@calpoly.edu
Phone	

[Edit Info](#)
[Change Password](#)

Internship Experiences

Company	Job Title	Location	Start Date	End Date	Notes
Te Connectivity	Digital Factory Industrial Engineer	Miami, FL, USA	3/3/2133	1/6/4533	This was a cool Co-Op
Dart Container	Project Engineer	Bath, MI	1/2/1888	1/5/4533	Clean facility
Deloitte	Business Analyst Intern	Los Angeles, CA, USA	1/1/1544	2/2/1666	Great intern perks

[Edit Internships](#) | [Add New Internship](#)

Full Time Jobs

Company	Job Title	Location	Start Date	End Date	Notes
Boeing	Process Engineer	Seattle, WA, USA	3/4/2133	Current Job	Planes Planes Planes
Honda	Process Engineer	Osaka, Osaka Prefecture, Japan	1/7/1111	2/2/1666	Living in Japan is awesome!

[Edit Jobs](#) | [Add New Job](#)

Figure 5: Edit Personal Information:

Member Information

Initiation Date	Spring 2012
Cal Poly Graduation	Spring 2015
Current City	San Luis Obispo, CA, USA
Email	bpbuell@calpoly.edu
Phone	

[Edit Info](#)
[Change Password](#)

Figure 6: Edit Work Experience:

Internship Experiences

Company	Job Title	Location	Start Date	End Date	Notes
Te Connectivity	Digital Factory Industrial Engineer	Miami, FL, USA	3/3/2133	1/6/4533	This was a cool Co-Op
Dart Container	Project Engineer	Bath, MI	1/2/1888	1/5/4533	Clean facility
Deloitte	Business Analyst Intern	Los Angeles, CA, USA	1/1/1544	2/2/1666	Great intern perks

[Edit Internships](#) [Add New Internship](#)

Full Time Jobs

Company	Job Title	Location	Start Date	End Date	Notes
Boeing	Process Engineer	Seattle, WA, USA	3/4/2133	Current Job	Planes Planes Planes
Honda	Process Engineer	Osaka, Osaka Prefecture, Japan	1/7/1111	2/2/1666	Living in Japan is awesome!

[Edit Jobs](#) [Add New Job](#)

Figure 7: Search Results:

Search APM Internships and Jobs

Search By:
 AND OR

[Search](#)

Type	Member	Company	JobTitle	Location	StartDate	EndDate	Note	
Internship	Tester 8	Cisco	Process Improvement Intern	Sunnyvale, CA	6/2/2014	9/2/2015	Electronics MFG	Connect
Internship	Tester 14	Cisco	Process Manager	Sunnyvale, CO	1/1/1111	1/2/1112	yay cisco	Connect
Internship	Tester 4	Cisco	Supply Chain Intern	San Jose, CA	4/6/2010	2/5/2222	so much supply chain	Connect

Figure 8: Connect:

Connect with Tester 8

Initiation Date Winter 2015
Cal Poly Graduation Spring 2015
Current Location unknown
Current Job unknown

Selected Experience

Company	JobTitle	Location	StartDate	EndDate	Note
Cisco	Process Improvement Intern	Sunnyvale, CA	6/2/2014	9/2/2015	Electronics MFG

Send them an Email

To: Tester 8
From: bpbuell@calpoly.edu
Subject:
Body:

Send

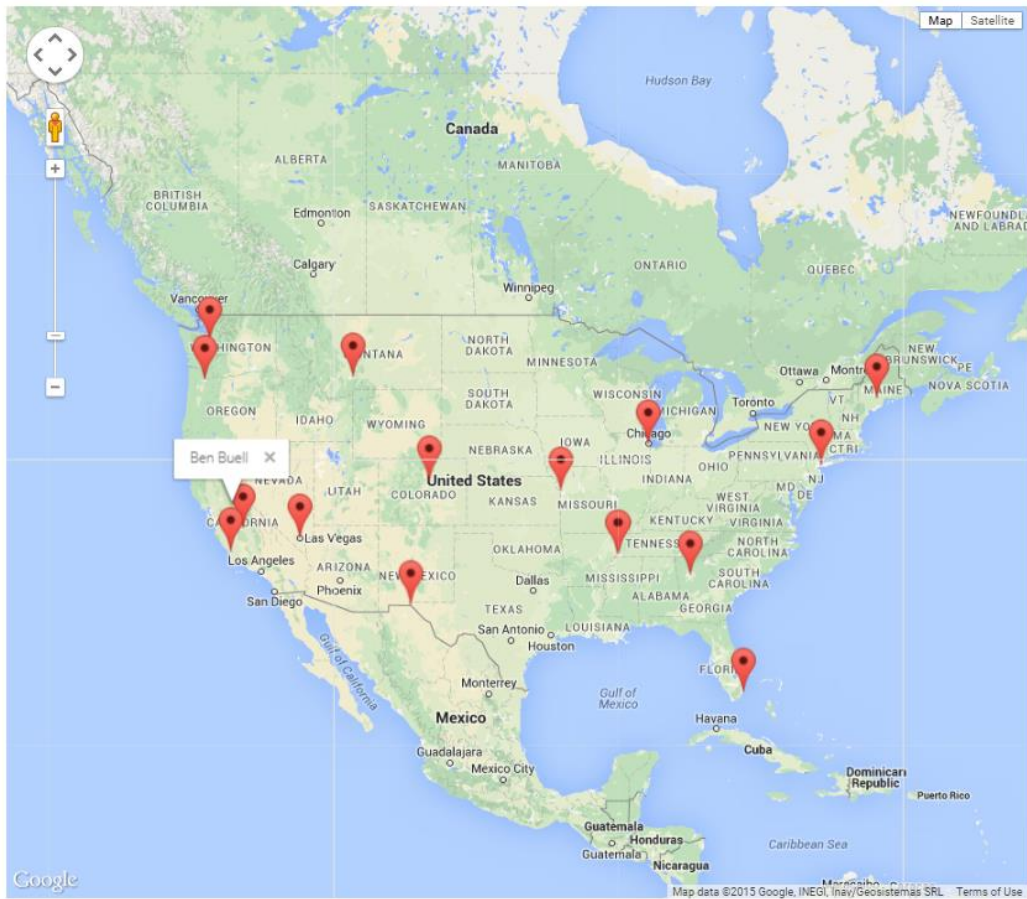
Cancel

Figure 9: Master User:

CPUser	FirstName	LastName	Phone	PersonalEmail	APMInitiation	Graduation	Location
bpbuell	Ben	Buell		bpbuell@calpoly.edu	Spring 2012	S2015	San Luis Obispo, CA, USA
tester1	Tester	1		okeefe.s.e@gmail.com	Winter 2015	F2011	Clovis, CA, USA
tester2	Tester	2	9167705916	okeefe.s.e@gmail.com	Winter 2015	S2015	Waterville, ME, USA
tester3	Tester	3		okeefe.s.e@gmail.com	Winter 2015	F2045	Bozeman, Mt, USA
tester4	Tester	4		okeefe.s.e@gmail.com	Winter 2015	F2018	Atlanta, GA, USA
tester5	Shannon	Okeefe		okeefe.s.e@gmail.com	Winter 2015	S2019	Seattle, WA, USA
tester6	Tester	6	916-997-2738	okeefe.s.e@gmail.com	Winter 2015	S2016	New York, NY, USA
tester7	Tester	7		okeefe.s.e@gmail.com	Winter 2015	S2018	Denver, CO, USA
tester8	Tester	8	9254514960	okeefe.s.e@gmail.com	Winter 2015	S2015	Chicago, IL, USA
tester9	Tester	9	(916) 337-1235	okeefe.s.e@gmail.com	Winter 2015	F2015	Kansas City, MO, USA
tester10	Tao	Yang		okeefe.s.e@gmail.com	Winter 2015	S2017	Taipei, Taiwan
tester11	Tester	11		okeefe.s.e@gmail.com	Winter 2015	S2015	Portland, OR, USA
tester12	Tester	12		okeefe.s.e@gmail.com	Winter 2015	F2015	Las Vegas, NV, USA
0	Tester	13	510-825-6396	edited@gmail.com	Winter 2015	F2015	Memphis, TN, USA
tester14	Tester	14		okeefe.s.e@gmail.com	Winter 2015	W2016	El Paso, TX, USA
tester15	Tester	15		okeefe.s.e@gmail.com	Winter 2015	F2016	Miami, FL, USA
masteruser	Master	User	N/A	cpsloalphapimu@gmail.com	N/A	unknown	N/A

Edit Add New

Figure 10: Member Map:



Appendix B – User Testing Questionnaires

Figure 1: User Testing Questionnaire Iteration 1:

Edit this form

APM Networking User Feedback 1a

This form is to generate user feedback to improve the quality and functionality of the APM Networking website

1) Log in to APM Connect using the username and password provided
On a scale of 1 - 5, how difficult was it to log into the site?

1 2 3 4 5

Less Difficult More Difficult

Could the log in process be improved in any way?

2) Add a new internship experience
On a scale of 1-5, how difficult was it to add a new internship experience?

1 2 3 4 5

Less Difficult More Difficult

Could the process of adding a new internship experience be improved in any way?

3) Add a full time job experience
On a scale of 1-5, how difficult was it to add a full time job experience?

1 2 3 4 5

Less Difficult More Difficult

Could the process of adding a new full time job experience be improved in any way?

4) Edit your original internship experience

On a scale of 1-5, how difficult was it to edit your original internship experience?

1 2 3 4 5

Less Difficult More Difficult

Could the process of editing internship experiences be improved in any way?

5) Edit your original full time job experience

On a scale of 1-5, how difficult was it to edit your original full time job experience?

1 2 3 4 5

Less Difficult More Difficult

Could the process of editing full time job experiences be improved in any way?

Do you have any additional comments

Submit

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Figure 2: User Testing Questionnaire Iteration 2

[Edit this form](#)

APM Connect Test 2a

*** Required**

What did like about the search function? *

What did you not like about the search function? *

Any other improvements that could be made to the site?

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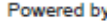
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Figure 3: User Testing Questionnaire Iteration 3, Test 1

[Edit this form](#)

Test 1 - Alpha Pi Mu Connect Feedback

Thank you for testing our site, we appreciate your feedback on your experience

*** Required**

How was the Login Process? *

- Difficult
- Somewhat difficult/confusing
- Neutral
- Somewhat intuitive
- Very intuitive/easy

How was the process of Editing Personal Information? *

- Difficult
- Somewhat difficult/confusing
- Neutral
- Somewhat intuitive
- Very intuitive/easy

How was the process of Changing the Password? *

- Difficult
- Somewhat difficult/confusing
- Neutral
- Somewhat intuitive
- Very intuitive/easy

How was it to use the Member Map feature? *

- Difficult
- Somewhat difficult/confusing
- Neutral
- Somewhat intuitive
- Very intuitive/easy

How was the process of Adding and Editing an Internship? *

- Difficult
- Somewhat difficult/confusing

- Neutral
- Somewhat intuitive
- Very intuitive/easy

How was the process of Contacting a Current Officer? *

- Difficult
- Somewhat difficult/confusing
- Neutral
- Somewhat intuitive
- Very intuitive/easy

How was overall site navigation? *

(your ability to move through the features of the site and find what you needed to do)

- Difficult
- Somewhat difficult/confusing
- Neutral
- Somewhat intuitive
- Very intuitive/easy

Please provide feedback on the feature that was most difficult/confusing to use *

Submit

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Figure 4: User Testing Questionnaire Iteration 3, Test 2

[Edit this form](#)

Test 2 - Alpha Pi Mu Connect Feedback

Thank you for testing our site, we appreciate your feedback on your experience

*** Required**

How was the Login Process? *

- Difficult
- Somewhat difficult/confusing
- Neutral
- Somewhat intuitive
- Very intuitive/easy

How was the Search page functionality? *

- Difficult
- Somewhat difficult/confusing
- Neutral
- Somewhat intuitive
- Very intuitive/easy

How was the process of connecting to a member via the search page? *

- Difficult
- Somewhat difficult/confusing
- Neutral
- Somewhat intuitive
- Very intuitive/easy

How was the process of adding/editing a job? *

- Difficult
- Somewhat difficult/confusing
- Neutral
- Somewhat intuitive
- Very intuitive/easy

How was it to find the name of a current club officer? *

- Difficult
- Somewhat difficult/confusing

- Neutral
- Somewhat intuitive
- Very intuitive/easy

How was overall site navigation? *

(your ability to move through the features of the site and find what you needed to do)

- Difficult
- Somewhat difficult/confusing
- Neutral
- Somewhat intuitive
- Very intuitive/easy

Please provide feedback on the feature that was most difficult/confusing to use *

Submit

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Figure 5: User Testing Questionnaire Iteration 3, Test 3

[Edit this form](#)

Test 3 - Alpha Pi Mu Connect Feedback

Thank you for testing our site, we appreciate your feedback on your experience

*** Required**

How was the Login Process? *

Difficult

Somewhat difficult/confusing

Neutral

Somewhat intuitive

Very intuitive/easy

How was the process of adding/editing an industry contact? *

Difficult

Somewhat difficult/confusing

Neutral

Somewhat intuitive

Very intuitive/easy

How was the process of adding/editing a new club member? *

Difficult

Somewhat difficult/confusing

Neutral

Somewhat intuitive

Very intuitive/easy

How was the process of adding/editing a club officer position? *

Difficult

Somewhat difficult/confusing

Neutral

Somewhat intuitive

Very intuitive/easy

How was overall site navigation? *
(your ability to move through the features of the site and find what you needed to do)

Difficult

- Somewhat difficult/confusing
- Neutral
- Somewhat intuitive
- Very intuitive/easy

Please provide feedback on the feature that was most difficult/confusing to use *

Submit

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