



67-373 Software Development Project



EXECUTIVE SUMMARIES
2015

Carnegie Mellon University
Dietrich College of Humanities
and Social Sciences

Executive Summaries

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Pittsburgh Parks Conservancy

Executive Summary

Community Partner

Lauryn Stalter

Student Development Team

Weikun Liang

Taylor Poulos

Sanum Sheikh

Evan Wineland

Background

The Pittsburgh Park Conservancy (PPC) was founded in 1996 by a group of citizens concerned with the deteriorating conditions of Pittsburgh's historic city parks. Since 1998, PPC has worked with the city of Pittsburgh under a public-private partnership agreement. They have raised over \$76 million for park improvements, for Pittsburgh's four regional parks: Schenley, Frick, Highland and Riverview.

Project Description

Project Opportunity

The Pittsburgh Parks Conservancy currently has a mobile app that is difficult to use. Because the app is difficult to use, they have not promoted or otherwise circulated the app, and it does not have many users (our client reports <100 downloads). They do not believe that the application in its current state reflects well on the organization.

Project Vision

We propose a mobile application that will encourage residents of Pittsburgh to visit the parks and interact with the PPC. The app will primarily be informational, providing a detailed trail map marked with points of interest, donation capabilities and a way to view the PPC's events calendar.

Project Outcomes

Our team built a new mobile application that has helped enhance PPC's mission and improve the quality of life for Pittsburgh park visitors. Our app not only provides points of interests, information on events and individual parks but also successfully guides visitors within the parks through an adept user design. For example, the use of Google Maps provides more trail data than the previously used Apple Maps. Now, trails and points of interests are displayed directly on the map, thus, making it easier for users to get from point A to point B within the park.

Project Deliverables

We will be providing two zip folders with wireframes and source code repositories to Pittsburgh Parks Conservancy.

Recommendations

In order for our client to sustain our solution, it is imperative they hire the most qualified developers who understand their mission. Without knowledgeable developers, it will be impossible for PPC to maintain the app and further development to make it self-sustaining. If they continue to hire developers who are unable to meet their expectations, like their previous developer, it will be impossible for PPC to reach their mission of improving the quality of life of Pittsburgh's parks' visitors.

Most of the requirements we were unable to meet could only be met if changes were made to the backend, first. In order for these changes to be implemented by future developers or IS students they must possess knowledge of Ruby on Rails web applications and the Model-View-Controller design pattern. In addition, they should be able to make the future changes to the mobile apps as well. These students must also understand how to maintain a successful client relationship and communicate requirements, deadlines, and scope creep with the client

Student Development Team

Taylor Poulos served as project manager. Taylor is a Junior in Information Systems, Human Computer Interaction, and Creative Writing. Over the summer, he is working at ExpII, a crowdsourced textbook project based in Pittsburgh. He worked with Evan Wineland on the iOS version of the PPC app, and served as the liaison with our project adviser Joseph Mertz as well as the overall project manager

Evan Wineland is an Information Systems major. He will be interning for Apple this summer. He worked with Taylor Poulos on the iOS version of the PPC app, which required familiarizing himself with Swift. He also served as the general point of contact with Lauryn, our liaison from the PPC-- sending agendas, coordinating meeting times, etc.

Weikun Liang is a junior double majoring in Information Systems and Human Computer Interaction. She will be interning for Amazon this summer. For the project, she worked with Taylor to create the wireframes for the Android and iOS app. In addition, she was responsible for implementing the Android application together with Sanum.

Sanum Sheikh is a junior Information Systems major with a double major in International Relations & Politics. She will be interning at Nike this summer. On team Parks, she conducted quality assurance for the Android app, maintained the project plans, as well as produced sprint reports every week to keep track of project progress.

The Christian and Missionary Alliance: Bible Quizzing

Executive Summary

Community Partner

Tom Reay

Student Development Team

Ian Betancourt

Melinda Lin

Nathan Oh

Theophilus Onime

Background

The Christian and Missionary Alliance (CMA) is an evangelical Christian denomination that facilitates Bible Quizzing. Bible Quizzing is a student competition revolving around memorization and recitation of the Christian Bible. It is said that “Bible Quizzing brings people together and keeps focus on God” (Tom Reay, client partner). Bible Quizzing happens in many districts within the US such as Western Pennsylvania (WPA), Ohio Valley, as well as in Canada, and Middle Eastern countries.

Currently, a PHP web app database (<http://biblequizstats.org/index.php>) is used to maintain student and team Bible Quizzing performance and upcoming quiz information for the greater Pittsburgh region in the WPA district. The app is maintained mostly by Professor Heimann (“Prof H”). Our client partner is Tom Reay, who represents Allegheny Center Alliance Church (ACAC), one of CMA’s churches. Specifically, Tom represents the Bible Quizzing department of ACAC.

Project Description

Project Opportunity

CMA faces a fair number of problems with their existing solution. One problem is that most changes to the database require usage of the command line, hindering CMA members who do not possess such technical knowledge from easily updating the database. The second problem is that other districts/areas that participate in Bible Quizzing currently do not have technological databases like WPA. A third problem is that the current site does not calculate quiz scores.

Project Vision

Our project seeks to provide the ability for an area admin like Tom to perform *all* the actions necessary to administer the record-keeping web application for WPA Bible Quizzing, biblequizstats.org. We aim to fill the gaps in the web interface and enable users with proper login credentials to perform their needed tasks which once required use of the command line.

For Bible Quizzing participants, our solution allows monitoring of their quizzing results. For the students’ friends and relatives, our solution enable them to see students’ Bible Quizzing results. For

area administrators, our solution provides them the ability to input scoring and quiz information into the database without specialized technical knowledge.

Project Outcomes

Give an overview of your project outcomes. You don't have to include all that will be in your final report, but include important people, process, and technology outcomes (not just technology ones).

Through our solution, a new Ruby on Rails web app, we delivered the following overall values to our client organization. Three main values include **increasing the usability of the web app for non-technical users** by updating the user interface, **improving the user experience on the website** by allowing students to see rankings and imitating the mental model of the previous PHP web site, and **enhancing maintainability** by using a Ruby on Rails framework and **extending the web app audience to other districts besides CMA**.

Project Deliverables

Deliverables include web application, wireframes, entity relationship diagram (ERD), data dictionary, design decisions (documentation), and other relevant photos/artifacts

Recommendations

Due to the possibility of the server the web app is operating on dying, we recommend regular data backups and purchasing a backup server with RAID set up by a professional, which allows one server to take over immediately if the other dies without any loss of data. In potential occurrences of the web app breaking or system requirements changing, we recommend hiring a professional Rails developer, seeking help again from the CMU IS department, or seeking the help of technical ACAC member Professor Larry Heimann.

Student Development Team

Melinda Lin was the project manager. She is a third-year Information Systems major (class of 2016) with a minor in Business. Melinda is seeking a career in project management after she graduates from CMU.

Nathan Oh was the documentation lead. He is a third-year Information Systems major (class of 2016) with a minor in Chemistry. Nathan is seeking a career in medicine after he graduates from CMU.

Theophilus Onime was the assistant technical lead. He is a third-year Information Systems major (class of 2016) with a minor in Global Systems and Management. Theophilus is seeking a career in banking-technology after he graduates from CMU.

Ian Betancourt was the technical lead. He is a third-year Information Systems major (class of 2016) with a minor in Computer Science. Ian is seeking a career in computer programming after he graduates from CMU.

The Bridge API

Executive Summary

Community Partner

Elizabeth Rapoport

Student Development Team

Jake Correa

Melanie Freeman

Benjamin Lam

Aditi Sarkar

Background

Within Carnegie Mellon University (CMU), the Office of Student Activities serves to provide students with non-academic resources. In particular, Student Activities empowers the more than 280 student organizations officially recognized by Student Government. The client, Elizabeth Rapoport, is the Assistant Director of Student Activities. She is the primary administrator and planner for any projects or changes involving the Bridge, a third party system by CollegiateLink, that stores information on non-academic organizations at CMU. This system was implemented three years ago in the hope that it would act as a hub for all student organization workflows, including recruitment, event promotion, and organization management.

Project Description

Project Opportunity

Although the Bridge serves its purpose as an information repository, the goal of sharing this information effectively amongst the student body had not been addressed. There is an existing application programming interface (API) to access this information, but students can't easily get keys to use it due to security concerns – the existing process to apply for a key is a paper application that takes up to several weeks to be approved by all parties. This is because the API can only offer all public and private student organization data, not a portion of it. This raises several problems, including financial records and special interest group membership details. Consequently, use of the API is highly restricted. Our client wants to give student organizations and on-campus developers an API with suitable authentication management, so that students can access and use data for academic or personal projects.

Project Vision

We planned the design and development of a new API using Ruby on Rails custom built for the CMU Student Activities Office that serves as an authentication middleware between developers on campus and the existing API. Instead of handing out the master key, applicants will receive their own key with specific permissions determined by our client, the Assistant Director of Student Activities. At a high level, our system will have a front-end website where users sign on and use a text based form to request user keys for themselves. Key requests need to be approved by a list of staff approvers, who can leave comments and assign permissions to each application. Successful

implementation will remove barriers in allowing student developers on campus to create meaningful applications relevant to Carnegie Mellon's student activities and events and provide value to the campus community, while maintaining the security of the information on the Bridge.

Project Outcomes

We have developed a web application that serves as both an online application for an API key and a secure API that allows developers to access information stored on the Bridge. Developers on campus can apply for keys to access information on the Bridge, and the administrator of the system is able to review these applications and assign appropriate permissions on a per application basis.

Project Deliverables

The final project is hosted at <https://stugov.andrew.cmu.edu/staging/bridgeapi/>. We have set up staff and administrator accounts, and have trained our client on how to use the system as an administrator. We have open sourced our application code on GitHub at <https://github.com/cmu-student-government/shinymetal/>. We have also created an instruction manual for administrator reference and have documented our application code extensively for future maintainers of our project.

Recommendations

We recommend that Student Activities onboard previously interested organizations (Computer Club, CUC TV Screens) into our system. Following that, we recommend advertising our system to other campus organizations, and eventually classes/individual developers.

We recommend that future developers on this project keep in close contact with the administrator at that time to discuss improvements and new features.

Student Development Team

Jake Correa served as project manager and UI developer. He is a third-year student majoring in Information Systems. He will be working for Apple Inc. this summer as a project manager.

Melanie Freeman was the client advocate and developer. She is a third-year student majoring in Information Systems.

Ben Lam led development of the API functionality development of the API functionality. He is a third-year Information Systems student with a minor in Computer Science. He will be working at Epic this summer as a software development intern.

Aditi Sarkar contributed as a developer and QA manager for this project. She is a third-year student majoring in Information Systems with a minor in Physical Computing. She will be interning at Deutsche Bank this summer.

Center for Building Performance and Diagnostics

Executive Summary

Community Partners

Azizan Aziz

Bertrand Lasternas

Student Development Team

Swathi Anand

Clara SeoHyun Shim

Ankur Toshniwal

Leo Ying

Background

The Center for Building Performance and Diagnostics (CBPD) is an extension of the School of Architecture at Carnegie Mellon University. The mission of the CBPD is to conduct research, development, and demonstrations to increase the quality of and user satisfaction with commercial buildings and integrated building systems, while improving cost, time, and energy-efficiency. The Robert L. Preger Intelligent Workplace, outfitted with advanced computer and diagnostic equipment, is a "living" and "lived-in" laboratory that houses the CBPD faculty, including Azizan Aziz (Senior Research Architect) and his team of approximately 10 PhD and master students with various technological skillsets.

Project Description

Project Opportunity

The primary problem that CBPD and Azizan's team were facing was the lack of engagement within the campus community (student, faculty and staff) to conserve energy at CMU. After analyzing submetering data on approximately 35+ campus buildings this past fall semester, they have identified many ways that people's behavior can improve the performance of such buildings without interrupting their activity inside the building. If these strategies can be properly implemented, thousands or even millions of dollars can be saved from the university's energy bill. As students ourselves, Azizan believes our team has a better understanding of how we can engage our peers to conserve energy at CMU better than himself & his team and thinks we can take advantage of that to address this issue.

Project Vision

In an effort to fulfill CBPD's goals, our initial project vision was to conduct surveys and interviews on our key stakeholders: students, faculty and staff, Facilities Management Services (FMS) to get their opinions on issues related to campus energy consumption and future efforts to conserve energy on-campus. After the research phase, we would analyze our results and brainstorm the best technological solution to resolve CBPD's problem. We would hope to come up with a sufficient number of use cases for our technological solution and explore ways in which the student body can interact with it to see campus energy consumption and file complaints to FMS.

Project Outcomes

After interviewing our stakeholders, surveying over 240+ students and 50+ staff/faculty, and presenting our results to CBPD and two FMS representatives, we concluded that there is a substantial disconnect between the student/faculty body and FMS, where information regarding campus energy usage or efforts to make the campus 'more green' are not made aware to the general CMU community. To solve this problem we decided to create a web application to break the communication barrier between Carnegie Mellon students & faculty, and the staff at FMS with regards to campus energy usage.

Project Deliverables

Our deliverable is a web application through which students, faculty and staff can make posts on energy conservation issues they see around campus by taking a photo and writing a short description. Students, faculty and staff can consequently upvote/downvote and comment on others' posts. Registered FMS staff will be able to view and address issues made through these posts and make statuses on campus initiatives to go green. This application is deployed on Heroku, and utilizes Django as the framework and PostgreSQL as the database.

Recommendations

Since our team had to focus all our efforts on building a solid minimum viable product by the end of the semester, we were unable to incorporate all the B/C-level functionalities and features that Azizan and our team would have hoped to see implemented in ConnectFMS. We advise future development teams to improve the user experience and develop a dashboard for users to view statistics on trending posts, popular topics discussed among users, areas on campus complained of the most and more. This would allow FMS administrators to address users' campus energy issues faster and potentially observe rising issues even before more users post about them.

Student Development Team

Swathi Anand led the team as the project manager and backend developer. She is a junior Information Systems major with a minor in Human-Computer Interaction. She will be interning at JP Morgan Chase this summer and is looking toward a career in application development and user experience design.

Clara SeoHyun Shim led the team as the designer. She is a senior Information Systems major with minors in Human Computer Interaction and Global Systems Management. She will be taking a gap year to pursue a career in technology in the fashion industry before attending graduate school.

Ankur Toshniwal led the team as the full stack developer. He is currently a junior in Information Systems and also pursuing a Computer Science minor. He will be interning as a Software Developer at Y Media Labs and hopes to be an entrepreneur following a career in software development.

Leo Ying was the database and deployment lead, and assisted with front-end development. He is a Junior Information Systems and Human-Computer Interaction double major. He will be interning at McKinsey as a technology consultant this summer and is looking toward a career in technical consulting.

Six Degrees of Francis Bacon

Executive Summary

Community Partners

Professor Chris Warren

Jessica Otis

Student Development Team

Audrey Alpizar

Sherry Chen

Tommy Hung

Sky Kaye

Background

Six Degrees of Francis Bacon (SDFB) is a digital reconstruction of an Early Modern Social Network (EMSN) that depicts early modern England's networked culture in a visual and accessible way. This project is under the direction of Professor Christopher Warren, Assistant Professor of English at Carnegie Mellon University and Jessica Otis, PhD fellow at Carnegie Mellon University.

SDFB is meant to be extensive, collaborative and a crowd sourced project that scholars around the world can update in real-time. Through the use of data mining and drawing from resources such as books, articles, and manuscripts, SDFB visualizes and describes the relationships between early modern persons, documents, and institutions in a unified, systematized way. It is designed as an exploratory visualization that is free of charge for other historians, literary critics, art historians and researchers to use.

Project Description

Project Opportunity

SDFB is seeking to build an online application where users can visualize and filter through the reconstructed social network data. Graphic visualization of the historical data offers a unique and effective way to learn and explore. The client's biggest concern with the project is user experience. They are confident that there will be high initial interest in the project, but are concerned about retaining these users. The client is concerned about an unusable application, which manipulates 13,000 nodes, or individuals, and 180,000 edges, or relationships. It is expected that this database will increase in size, and it is critical to improve the social network searching and visualization.

Project Vision

Vision Statement: Improve the user's experience to conform to performance expectations and incentivize the user to return to the site in the future frequently. The goal for this project is to elevate the current developing application to a system that encourages users to return to the site, become curious about the time period, seek to contribute and leverage the system to independently

conducted research. We believe the most value can be added through improving the user experience by fixing deployment issues and running user experience testing because these are the most critical factors in user retention.

Project Outcomes

In order to improve the loading speed, the development team chose to implement a client side database. An API was also created to easily access people, relationship and group data in a way that was convenient to pass to the front-end.

Furthermore, extensive user testing was completed on the existing application and the solution to the development team was working on. This user testing provided insightful feedback that helped prioritize what additional features, modifications in the design and correcting issues in core features of the project. Some of these features included group networks, shared groups, shared networks, and being able to explore the network without reloading the page.

Project Deliverables

The final deliverable includes a deployed version of the application. In addition, documentation and the code base will be uploaded to the project's github account, which is managed by the client. We will also meet with the client in order to transition the code and familiarize them with the changes made, and how to maintain the code base for future development.

Recommendations

We recommend that the client continue to do more extensive user testing on the application with professors, academics, and users of various age groups. Based off of the results of the user testing, we compiled a list of potential features that can be implemented to further increase user retention and user experience. A summary of all the user testing that has already been completed will be among our final project deliverables.

In addition, as the client continues development of the project, we recommend that data should be accessed exclusively through the API. Using the API will prevent the application from running slowly, especially as the data set grows. If any additional methods need to be created for the API, the client should create a view for the database and call that view in the API.

Student Development Team

Audrey Alpizar served as project manager and user experience lead. She is a fourth-year student majoring in Information Systems with a minor in Engineering Studies.

Sherry Chen was a front-end and back-end developer. She is a third-year student majoring in Information Systems with additional majors in Statistics and Business Administration.

Tommy Hung led back-end development. He is a third-year student double majoring in Information Systems and Computer Science.

Sky Kaye was the technical lead. He is a third-year student majoring in Information Systems with a minor in Intelligent Environments.

University of Pittsburgh School of Medicine

Executive Summary

Community Partner

Annerose Berndt

Student Development Team

Sanika Natu

Skylar Weaver

Akash Khanolkar

Serena Chen

Background

The organization that we are working with is the University of Pittsburgh School of Medicine. It works closely with the University of Pittsburgh Medical Center (UPMC), which is a world-renowned medical facility. In terms of the clients that we are working with specifically, they are Dr. Annerose Berndt and faculty members within the Division of Pulmonary, Allergy, and Critical Care Medicine of the University of Pittsburgh School of Medicine. Even more specifically, we will be working on our project within Dr. Berndt's lab.

Project Description

Project Opportunity

One of the most prominent problems facing our client is that the application that her lab used for its murine genome-wide association studies (GWAS) has been down for around a year. During this time there wasn't an open platform that allowed researchers in the field to share, analyze, and collaborate with their research data. The researchers can continue to complete their research, but they are required to run SNP associations manually and they can no longer share their data with other researchers. An open platform can facilitate not only collaboration but also co-creation among researchers. The reporting and analytical functionality in the previously working application allowed researchers to better assess their results through a standard process and algorithms, which now have to be run manually and individually. Pinpointing and solving the problem of malfunctioning in the current system enables researchers to better access, analyze and share the research results among peers. Finally, a well-documented and deployed application can make it easier for Dr. Berndt and her lab to maintain the application in the long run.

Project Vision

We are proposing to develop and test the current Ruby on Rails system in order to allow Berndt Lab researchers the opportunity to share, collaborate, and analyze their data. The result of this project will create a usable, well-tested and sustainable system so that researchers can easily upload their research data onto the system, perform analyses for research purposes and finally share this data. By providing various components to the system like file upload functionality to easily upload CSV data files, statistical analysis to formulate reports and graphs of the data, and social media features to facilitate collaboration, the project will ensure that researchers can increase efficiency of their

research processes. We are aiming to repair the current system and get the system to a deployable state by May.

Project Outcomes

The goal of this project was to recover the Mouse Data Research Project that lost important data and code during a major server crash. After the crash, the project was inoperable, undocumented, and had poor test coverage. We automated the deployment process by implementing bash scripts to setup the server. From start to full deployment the bash scripts will set up the server environment and deploy the project. After successfully deploying the project, we focused on fixing much of the lost code from the server crash. Finally, a very important part of the project was fixing the statistical analysis pipeline, which includes R, Sidekiq, and other software modules. After fixing these modules we focused more on problems that were useful to the project in the long-term and making it maintainable.

Project Deliverables

We are delivering a functional Ruby on Rails application and experimental data management system that is deployed on a DigitalOcean server. The code is stored on a GitHub repository that includes documentation on setup on localhost and deploying on the server.

Recommendations

Our goal was to make this project as sustainable as possible once we leave from this semester, so as long as the client follows the documentation during times of issues there shouldn't be a problem. It is also important that the client's team takes the time at least on a biweekly basis to check the status of the server. Through Monit, a server management software we implemented, they can run the simple command Monit Status on the server and see if the server is under distress. This is an important recommendation because the main reason that the project crashed is that the server was not properly being maintained when it crashed and the code was not easy to salvage.

Student Development Team

Sanika Natu served as the project manager. She is a fourth-year student majoring in Information Systems with a double major in Business Administration. She will be working at PwC beginning in August 2015 as a technology consultant specializing in IT Infrastructure.

Skylar Weaver served as the Quality Assurance and DevOps lead. He is a third-year student from Central PA and will be working for Deloitte this summer as a business technology consultant.

Serena Chen served as the Python / R lead. She is from China and is a third-year student in Information Systems with a minor in Business Administration. She will be working at KPMG HK as a technology consultant this summer.

Akash Khanolkar served as a devops lead. He is a third-year student majoring in Information Systems. He is from Princeton New Jersey. He will be doing product development this summer in India.

Pittsburgh Kindness Initiative

Executive Summary

Community Partners

Larry Gioia
Kevin Bright
Bert Dorazio

Student Development Team

Lamis AL-Agamy
Gale Bonker
Annie Chen
Raksha Rao

Background

The Pittsburgh Kindness Initiative, a movement founded in Pittsburgh in 2013, is dedicated to increasing kindness within the Pittsburgh community - one smile at a time. Their affinity for “kindness cards,” which are handed to the recipients of random acts of kindness by those performing the act, have been redesigned by our consultation team to include a 9-digit tracking functionality. This functionality is featured in our website, which enables people to share their stories, read stories of kindness posted by others, view upcoming events hosted by PKI, create profiles, and contact the organization.

Project Description

Project Opportunity

The Pittsburgh Kindness Initiative wants to “track” how far kindness has gone through the distribution of their kindness cards. They would like to spread their message of kindness further both geographically (how many miles does their kindness message travel physically?) and quantitatively (how many people are affected by their acts of kindness?). They would like to increase the quantity and frequency of kind acts that are performed in Pittsburgh and beyond.

Project Vision

Our vision statement is to spread kindness throughout Pittsburgh by developing a website for the Pittsburgh Kindness Initiative with kindness card tracking capabilities. Our clients would eventually like to extend their impact beyond the city by inspiring everyone to spread kindness.

Project Outcomes

In order to solve the Pittsburgh Kindness Initiative’s needs, we created a website using Wordpress that offers its users a variety of features and information. Users can register and log in, and read, share and search for stories about random acts of kindness. When the users share their stories, they have the option to include their kindness card’s tracking number. If a tracking number is included with a story post, that story will then be tied to all the other stories associated with that card. This

allows the user to see where and how far their kindness has spread. Our site also contains information about the PKI as an organization, frequently asked questions, and upcoming events.

Project Deliverables

Our website can be found at www.kindnesspgh.com. Anyone can create an account as a subscriber role, but in order to edit the site using Wordpress, you must log in with the Bekindpgh admin account. All the necessary information on how to log in has been provided to our clients.

Recommendations

It is our recommendation that the Pittsburgh Kindness Initiative continues to promote kindness through the use of their website and kindness cards. In order to expand throughout the Pittsburgh community and to other places around the world, the PKI must always strive to understand kindness as it understood from culture to culture. We also suggest that any future 67-373 project teams that work with the PKI expand upon our site's security features, utilize consistent and intuitive design, maintain validations of data in story posts, and incorporate other features, such as the users' ability to edit stories after they post them.

Student Development Team

Gale Bonker is a junior Information Systems major with a Human-Computer Interaction minor. For the project, Gale served as the Content Lead, Front-End Co-Lead and Project Smile Coordinator. Gale will be working as a User Experience Intern at CustomInk this summer.

Annie Chen is a junior Information Systems major with a minor in Human Computer Interaction. For this project, Annie served as the Technical Lead by configuring the bulk of our website's functionality. Annie aspires to earn a career in user experience design.

Raksha Rao is an IS major with minors in Business and Technical Writing. She served as the front-end development lead, the content co-lead, and the project manager. Raksha will be attending the Information Systems Accelerated Master's program Management next fall.

Lamis AL-Agamy is a junior Information Systems major with a minor in Business Administration. In the project, her roles included technical programming, CSS, and marketing. She is looking forward to obtaining a Masters degree in Healthcare Informatics.

Phipps Conservatory: Member Card App

Executive Summary

Community Partners

Mary DeMars

Bob Mermelstein

Student Development Team

Kevin Chiu

Ian Go

Matthew Nielsen

Peter Podniesinski

Background

Phipps Conservatory is a large Victorian greenhouse located in Schenley Park. The botanical gardens at Phipps are made up of a variety of rotating exhibits as well as a standing collection. Phipps spreads knowledge about plants to its guests while providing them with an enjoyable and relaxing experience. Additionally, the organization has become a strong advocate for advanced green building practices, sustainable gardening, and a new environmental awareness. Phipps is proud to have over 12,300 members who help to support its organization.

Project Description

Project Opportunity

Members are an important part of the ecosystem at Phipps Conservatory. Membership sales are a strong revenue driver for the organization and member participation contributes to the vivacious atmosphere of the gardens. Members carry cards with them when they visit Phipps; cards are scanned when members enter in order to expedite the check-in process. However, sometimes members forget to bring their cards and paper member cards wear out over time, slowing down the check-in process. Could technology speed up this process?

Project Vision

In today's fast-paced world most Americans carry a smartphone everywhere they go. Smartphones provide a platform for mobile apps that are easy to use and contain rich information. Additionally, smartphones are rarely left at home and they do not wear out like paper. The goal of the Phipps Conservatory Member Card App was to design, develop, and deploy a smart replacement for Phipps' paper member cards. The app would not only provide an electronic member card, but give members the ability to change their information, see recent news, and download smartphone wallpapers.

Project Outcomes

With a strong project vision in mind, the student development team diligently worked to deliver on its goals. The result of a semester's-worth of work is a fully-functioning mobile app for iOS and

Android. The mobile app encompasses the features stated previously as well as an email-based member authentication system. Also, a web server was developed to allow dynamic content to be served to the mobile app. Considerable attention was given to making the features in the app relevant to users and easy to use so that when they visit Phipps the technology is as wonderful an experience as the gardens. Training was given to the staff at Phipps on how to use the mobile app and how to update information displayed in the app. We believe that this project will truly enhance the Phipps experience.

Project Deliverables

Upon completion of the Member Card App, it was distributed to the Apple App Store and the Google Play Store. As of this writing, both apps are awaiting review. The source code for the mobile app and the web server have been provided to Phipps Conservatory for future maintenance and development. Documentation on the entire system as well as an all-inclusive report have been delivered.

Recommendations

At the time of this writing the web server portion of the system had not been deployed to a production-level environment. Our recommendation to Phipps Conservatory is to move forward with a “soft” launch of the Member Card App into the hands of a few trusted users who could further test the software. After further testing and migrating the web server to a production environment a full-scale launch of the app would be appropriate.

Student Development Team

Kevin Chiu acted as codebase manager and full stack developer. He is a third-year student in the Information Systems department with a secondary major in Economics. Kevin is working at J.P. Morgan in New York City this summer.

Ian Go served as design lead and front-end developer. He is a third-year student in the Information Systems department with a secondary major in Human-Computer Interaction. This summer he will be working at the startup incubator Project Olympus to develop his mobile app, Flagtag.

Matthew Nielsen was the team’s sprint manager and back-end developer. He is a third-year student in the Information Systems department. Matt will be working on the Service Cloud at Salesforce in San Francisco during the summer.

Peter Podniesinski served as full stack developer. He is a third-year student in the Information Systems department and he will be pursuing a Masters in Information Systems Management. This summer Peter is working at Goldman Sachs in New York City.

Homeless Children’s Education Fund

Executive Summary

Community Partners

Kaitlyn Nykwest
Carrie Pavlik
Laura Saulle
Bill Wolfe

Student Development Team

Stefan Dasbach
Alex Kim
Graham Schilling

Background

The Homeless Children’s Education Fund, founded in 1999 by Joseph Lagana, is a non-profit organization. They provide educational opportunities to homeless children in the Allegheny County through collaboration with several nearby partners. The organization consists of a small core team that works at the headquarters, located in the Strip District of Pittsburgh, but has a large overall network of teachers, volunteers, sponsors, and partners. Their educational initiative is realized through three main programs, after school sessions, enrichment workshops, and field-trips. Through these programs, data is collected pertaining to the kids they serve, such as homework progress, tutoring, and total amount of time spent at their programs.

Project Description

Project Opportunity

Each of HCEF’s educational programs, after school, enrichment, and field trips gather data on paper forms. After completion at the remote program location, the paper forms are either mailed to HCEF’s main location or are collected and brought back to the main location. The paper records are then logged into spreadsheets or word documents at the main location. This process has been identified as a key area to improve because it is a laborious, repetitive process that requires a lot of paper shuffling between different locations.

Project Vision

Our project vision was to create a web application that manages data from the various programs offered by HCEF. We wanted to allow all HCEF staff and volunteers to enter data from numerous remote locations on desktop, tablet or mobile and then access this data through the same application. This new process should eliminate most of the existing paper forms and paper shuffling between locations. It should also allow data from across programs to be congregated and analyzed to improve programs and help children achieve their learning and educational objectives.

Project Outcomes

We are happy to report, our outcome is very similar to what we envisioned. We delivered a live, hosted web application that HCEF can start using immediately to track their programs and the children they serve. All HCEF staff and volunteers can sign up for and interact with the system in terms of entering data and tracking the progress of their specific students by following their attendance and time spent on important tasks like homework and reading. Lastly the old process of paper forms and paper shuffling has been replaced with this system and will hopefully make a significant difference for HCEF in the near future.

Project Deliverables

We delivered a web application, pre-populated with data that we have received from HCEF, along with the following: relevant documentation of the application, admin credentials, access to hosting service, application manual for the users, and additional recommendations that HCEF should consider moving forward.

Recommendations

We recommend in the future, HCEF should continue development and build the functionality to track student's goals using the application. Using the data gathered by the application, HCEF can track if children's goals are being achieved in a timely manner. This will be another key metric to help them see if they are making the greatest possible impact on the children via their current programs. We also recommend developing a way to generate formal reports at the end of the year from the application. This will make it easier for HCEF to share the statistics about the children with their partners.

Student Development Team

Stefan Dasbach is a junior practicing Information Systems and Human Computer Interaction. He will be a software engineer at Apple this summer. Graduating in the spring of 2016, Stefan hopes to continue his passion of software development in California.

Alex Kim is currently a Senior in Information Systems, graduating in Spring of 2016 with a minor in Computer Science. Alex will continue pursuing his interests in web development after graduation.

Graham Schilling is a junior in Information Systems, planning to graduate in the Spring of 2016 with a minor in Business Administration. He will be working at Enova Financial this summer and plans to continue a career in web and mobile development after graduation.

VitaeFly

Executive Summary

Community Partner

Brian Mangone

Student Development Team

Adam Xiaotian Cao

Julia Harmison

Aayush Tekriwal

Jenny Yang

Background

Brian Mangone is the founder of a Pittsburgh startup, VitaeFly. The startup seeks to “*simplify the recruitment process by connecting companies with talented job-seekers and eliminate wastefulness through the digitalization of the recruitment process.*” Brian works full time for BNY Mellon which is where he came across the inefficiencies of the recruitment process at university career fairs. His experience working with BNY Mellon HR professionals inspired him to create VitaeFly.

Project Description

Project Opportunity

Career fairs are meant to facilitate communication and establish relationships between recruiters and potential employees. However, students spend most of their time at career fairs waiting in line just to talk briefly to a recruiter and drop off their paper resume. Even when students are able to talk with recruiters, feedback about the interaction is usually delayed and often nonexistent. Recruiters also face challenges at career fairs. They have to quickly jot down notes when talking with students and have to talk to hundreds of students per day. After the career fair, they leave with large stacks of resumes to organize and notes that may be hard to decipher. There is currently no solution to tackle these problems faced by students and recruiters at career fairs.

Project Vision

Our vision for this project was to create an iOS mobile application that allowed students and recruiters to manage and create connections during career fairs. More specifically, we wanted to create a queuing system to be used at career fairs. Similar to waiting in line at a restaurant, the student would be able put themselves on a queue for a particular recruiter at a company. When it is their time to have a conversation with the recruiter, the recruiter can easily view their resume on the application and leave real-time feedback about their conversation and prospects for potential opportunities with the company. Student and companies can easily sort through the interactions they had throughout the day. Through the use of VitaeFly, the users are able to save time and paper so that they can spend their time making meaningful connections at the career fair instead of waiting in line.

Project Outcomes

Our project has given Brian a foundation to make his vision a reality. We created a working minimum viable product for Brian. We were able to implement a queuing system that also tracks connections made between students and recruiters. Our application not only stores profile information about the users, but also allows the users to manage their time more efficiently.

Project Deliverables

Our main deliverable is a Git Repository containing the code and project documents. Ownership of the code will be given to Brian through the GitHub account. Our team will work with Brian to configure the Parse database so that the next team of developers can continue working on the application. All background research and design documents (i.e. ERD, wireframes, user stories, etc.) will be given to Brian.

Recommendations

Although a minimum viable product of the iOS application has been created as the final deliverable, there are many improvements that could be made and many additional features that could be added to the application. Along with the possible user stories that could be implemented, recommendations for how our client should approach scalability issues and how our client should accommodate for increased use in the future has been outlined in the final report.

Student Development Team

Adam Xiaotian Cao led development and quality assurance for the team. He is a junior Information Systems major with a double major in Computer Science. This summer, he will be interning with Heyzap, a startup in San Francisco, CA.

Julia Harmison managed client relations and served as a developer and designer. She is a senior Information Systems major with a minor in Business Administration. After graduation, she will be working for Deloitte in Chicago, IL.

Aayush Tekriwal served as a developer and designer for the application. He is a junior Information Systems major with a minor in Business Administration. He will be interning with Deloitte in Pittsburgh, PA this summer.

Jenny Yang served as a developer and designer for the team. She is a junior Information Systems major with a minor in Media Design. She will be interning with CSC in Austin, TX this summer.

Marketing for Entrepreneurship

Executive Summary

Community Partners

Professor Dave Mawhinney

Professor Bob Blattberg

Student Development Team

Nicholas Gasbarro

Justin Hilliard

Zehni Khairullah

Daniel Shlyuger

Background

The Carnegie Mellon Center for Innovation and Entrepreneurship (CIE) is a department within the Tepper School of Business at Carnegie Mellon. It offers opportunities at both the graduate and undergraduate levels. The CIE maintains several avenues for budding entrepreneurs to grow, as well as seek seed funding and advice. Its mission is: (1) to define CMU as the "destination of choice" for all individuals interested in entrepreneurship, (2) to foster an "inside-out" approach to creating winning commercial ventures from cutting-edge research and ingenious ideas for the benefit of society, and (3) To develop an extensive, vibrant network of alumni entrepreneurs.

Project Description

Project Opportunity

In the fall of 2014, CIE Professor Dave Mawhinney collaborated with distinguished Marketing Professor Bob Blattberg to offer a new MBA course titled "Marketing for Entrepreneurship." All content for this and all other Tepper courses are hosted on Canvas, which is a Learning Management System (LMS) similar to Blackboard. Bob and Dave wanted the ability to allow alumni, and others not currently enrolled in the course to access course content, and to control access to content.

Project Vision

This solution will benefit the course instructors, as it enables them to create a larger and more engaged alumni community, by giving alumni access to valuable course content. This expanded community is a key goal for the CIE. This will also benefit the course administrators, as it saves them from the laborious process of manually creating accounts for each student. Finally, it will benefit the alumni community, as it gives them access and keeps them engaged. Our vision for the project evolved over time from a custom solution into a workflow that allowed our clients to continue using Canvas, led by our client's desire for maintainability.

Project Outcomes

Our project outcomes involve their own large sets of work but are all intimately related, for example, our initial support documentation and analysis for course hosting solutions led us to suggesting the use of canvas for our client, preserving much of what they like about that system and giving us a clear path to exploring and ultimately implementing alumni access solutions.

Project Deliverables

We created extensive documentation to both our client and our advisor on all aspects of the project, a task that ultimately helped us use good judgment throughout the duration of the project. As mentioned above, our client wanted to stay away from a custom system due to maintainability issues. For this reason, we are delivering a Google Form with an Add-on script that will help to gather and organize the information needed to give access to alumni. The client will be able to send a specially formatted file to Tepper's Canvas administrators to process the adding request. We are delivering proper documentation on the usage of our plugin, as well as extensive research on the existing canvas plugin ecosystem that will help our client implement additional functionality on their Canvas course in the future.

Recommendations

Our team recommends that our community clients use the solution we provided until CMU gives alumni Andrew IDs. Our client will be able to grant access to alumni who are interested in the course content and will enable them to engage the alumni community. Furthermore, in the near future, when CMU gives Andrew IDs to alumni, it will be easier to add the students through the existing technology instantly without the need to use the Google Form Add-on.

Student Development Team

Daniel Shlyuger served as innovation lead. He is a junior major in Information Systems and Computer Science. He will be interning as a software engineer for Custom Ink and looking for a career in software engineering or technical product management.

Justin Hilliard served as technical lead. He is a junior major in Information Systems and a minor in Business Administration. He will be interning for JP Morgan as a business analysis and looking for a career in software engineering or technical product management.

Nicholas Gasbarro served as project manager. He is a senior majoring in Information Systems and minoring in Business Administration. He will be working for BNY Mellon, and is looking for a career in technology consulting.

Zehni Khairullah served as technical consultant. He is a junior major in Information Systems and minor in Business Administration. He will be interning for Host.qa as a tech consultant and web developer this summer and is looking for a career in technology or management consulting.

Family Tyes: Tracking System

Executive Summary

Community Partners

Paul Hindes

Bill Stein

Student Development Team

Angela M. Liu

Laura A. Lodewyk

Ming Y. Wu

Background

Family Tyes is a non-profit educational and youth development organization that introduces youth groups in the Pennsylvania region to fly-fishing, environmental conservation and leadership. Family Tyes' curriculum has grown to five states and every year they work with about 1000 kids. Their staff consists of 18 members and around a dozen volunteer mentors who assist in teaching classes and workshops. Family Tyes currently has an organization website (familytyes.org) as well as a deployed Ruby on Rails application (FT Tracking System) for attendance tracking. Though both systems were designed by external technical teams, core technology management functions are handled internally by leaders in the Family Tyes organizations, notably Bill Stein and Paul Hindes.

Project Description

Project Opportunity

The main problem Family Tyes faces is providing solid data to funders about the impact they have on the students enrolled in their programs. Solving this problem would help the organization secure current funding, as well as acquire new funding from outside sources. The previous IS team made headway into creating a system that would track students, but did not get far enough as to provide the metrics and analytics that Family Tyes needs. Solving this issue would also allow Family Tyes to understand their impact on their students and therefore adapt their programs to more closely fit student needs. As such, extending the current tracking system to send questionnaires and visualize, analyze, and present relevant data on students would be extremely valuable for the organization.

Project Vision

Family Tyes needed the ability to demonstrate student improvement and learning to funders, as well as tell a story about their impact on the lives of participants. To accomplish this, Tech Tyes decided to extend the functionality of the existing Family Tyes Tracking System to collect and analyze data about students. In particular, we implemented a checkpoint system that collected data such as student demographics, student learning outcomes (pre-test and post-test results), individual reflections/comments on the program, and other quantitative and qualitative data points. This includes displaying summary data such as total number of program participants, demographic breakdown of participants, and how participants scored on the pre-test versus the post-test, etc. For

Family Tyes, this data analytics/visualization implementation will allow them to provide solid evidence of their impact on the community and aid in their appeals for more funding.

Project Outcomes

Our final deliverable includes a system with improved functionality, including SurveyMonkey integration, graded checkpoints, and visualization data. We also created the leader user and the ability to one-click send emails with survey links. To ensure the sustainability of the system we deployed the project to an easily-transferable server and held training sessions with the client. For the client's documentation we provided a step-by-step instruction guide to the system, as well as a FAQ on the site. For future technical developers, we have technical documentation that details the reasoning behind decisions, as well as documented code.

Project Deliverables

At the end of this project, we delivered a deployed and extended tracking system for Family Tyes. Aside from the deployed system, we also handed over the following documents to Family Tyes:

- Github Repository for the Family Tyes Tracking System
- Step-by-Step System Reference Guide/Walkthrough for General Users
- FAQ embedded within the Family Tyes Tracking System
- Tech Tyes SurveyMonkey account with pre-populated surveys and survey templates
- Tech Tyes Gmail Account & Mashery API Account Credentials
- Technical Documentation for the Survey Monkey integration
- Documentation of our system design decisions for future developers System Diagrams

Recommendations

In the future, there are a few features that could increase the value of our solution. To increase student participation, a point-based incentive system could be created. The points could then be redeemed for badges, special events, or other appropriate items. In addition, by implementing student login functionality, Family Tyes could capture student reflections on their progress through the program in a 'Fish Tales' journal. Together, these improvements would increase use of the system and provide more data and information to Family Tyes that could be used to secure funding.

Student Development Team

Angela Liu served as the Technical Lead for the project. She is a junior double majoring in Information Systems and Human Computer Interactions graduating Spring, 2016. She is interning at Salesforce this summer and is interested in a career in software development and UI/UX.

Laura Lodewyk served as the Business Liaison for the project. She is a junior Information Systems Major graduating in the Spring of 2016. Laura is participating the CMU's TCinGC program this summer and is interested in pursuing a career in Project Management.

Ming Wu served as the QA & Documentation lead for the project. She is a junior Information Systems major graduating in Fall 2015. Ming is excited to be doing cybersecurity consulting with PwC this summer and is interested in a career in Information Security.

Zero Waste Pennsylvania: Waste Audit Application

Executive Summary

Community Partners

Justin Stockdale

Teresa Bradley

Ross Hirschfeld

Student Development Team

Achal Channarasappa

Ryan Donegan

Katherine Du

Maggie Li

Background

Zero Waste Pennsylvania (ZWPA) is a non-profit organization and is a part of the Pennsylvania Resources Council (PRC). ZWPA's primary goal focuses on waste diversion, audit, and proposal services that are available to businesses, educational institutions, and other nonprofits. The PRC's mission is "To lead and promote individual and collective actions to preserve Pennsylvania's environmental resources for each generation."

Project Description

Project Opportunity

One of the core services ZWPA provides is waste auditing, where Waste Audit Coordinators tour an organization's facilities and gather notes and observations to compile into a client proposal. If the client wishes to proceed with the audit, the waste auditors will collect data on-site and manually enter information into Microsoft Word/Excel for analysis. The greatest impediment to ZWPA's current waste audit process is its dependency on pen and paper. Re-engineering and enhancing the technology to streamline the waste audit data collection process would add considerable value to the organization, as ZWPA stands to gain both time and revenue from facilitating its fee-based services. Additionally, a faster turnaround in ZWPA reports and audits could encourage client interaction.

Project Vision

Working with PRC and ZWPA, we hope to implement a web application to facilitate data entry, management, and storage in regards to the waste auditing process. In particular, we aim to expedite the Initial Site Visit Questionnaire by allowing direct input, as well as enabling a web option that allows ZWPA staff members to quickly complete necessary fields. ZWPA auditors will also be able to quickly and digitally complete waste audit forms representative of current paper spreadsheets. Audit information will then be downloadable and available for instant analysis. Complementing all of these features is an organized system of note-taking and tracking that can be associated with specific projects and clients.

Project Outcomes

We have developed a mobile-compatible web application for ZWPA that aims to be a time-saving, reliable, and efficient product. The product was completed through the processes of documentation gathering, database and process analysis, conceptualization, and development. We've developed a great relationship within our team and with our community partner as well, so everyone is invested in the project and works together to make the product a successful one. We used Ruby on Rails to develop the application and chose PostgreSQL for the database. DigitalOcean, GoDaddy, and Capistrano were used to deploy our application onto the web.

Project Deliverables

We have delivered browser accessibility of the application and our GitHub Repository. The application is deployed on a website so that it is available for ZWPA's use; the website includes a comprehensive help page. We transferred the ownership of our Github repository to the client for any potential development in the future. In addition, our client has the credentials to the DigitalOcean and GoDaddy accounts for the hosting and domain services. We also provided instructions on how to login to root and deployer accounts for the web server as well as the procedure to reset the production database.

Recommendations

In order to build capacity, continued use of the application will allow ZWPA to leverage technology to meet their goals. Moreover, the centralized design of the application will improve ZWPA's ability to transform raw data into business intelligence. To ensure that the application is as time-saving as intended and efficient for ZWPA, it is vital that current and future users are trained in proper use of the application. To that end, we have provided a comprehensive 'Help' page to allow new users to learn about how to use and maintain the application. Our custom application is catered to ZWPA's processes, hopefully making learning the new system an improved experience.

Student Development Team

Achal Channarasappa was the Technical Lead. He is a third year Information Systems major with minors in Business Administration and Human Computer Interaction, expecting to graduate in Spring 2016. He will be working at Spiceworks this summer and is looking toward a career in project management.

Ryan Donegan was a Developer and UI Designer. He is a third year student majoring in Information Systems and Human Computer Interaction, expecting to graduate in Spring 2016. He will be working at Intuit this summer and is looking toward a career in UX Design.

Katherine Du was a Developer and UI Designer. She is a third year Information Systems major and Human Computer Interaction minor, expecting to graduate in Spring 2016. She will be working at LRNGO.com this summer and is looking toward a career in educational technology.

Maggie Li was the Project Manager. She is a third year Information Systems major with minors in Human Computer Interaction and Business Administration, expecting to graduate in Fall 2015. She will be working at Salesforce this summer and is exploring a variety of career paths including testing, design, management and development.

Pittsburgh Youth Chorus

Executive Summary

Community Partners

Carley Noel Black

Edwina French

Brian Yordnoff

Student Development Team

Chris Compendio

Kang Jun Park

Sam Walczak

Background

Pittsburgh Youth Chorus (PYC), formerly known as Children’s Festival Chorus, is a non-profit organization which offers nurturing and stimulating musical learning experiences to children ages five years and older. During its more than 30-year history, PYC provided professional-level choral education and performances not only to Pittsburgh, but also to the nation-wide community. With its new name, Pittsburgh Youth Chorus aims to have a new start and attract a larger audience.

Project Description

Project Opportunity

PYC is currently under the process of redesigning the organization. With this, there was a need to update technological infrastructure to better suit organization’s future needs. The primary opportunity of the project was updating the website, which is the primary form of communication with audience and chorus members.

Since the original website was developed by a person outside of organization years ago, there was an opportunity to reorganize existing information, create a long-term sustainability, and enhance user-friendliness. By solving some of issues, PYC will be able to reach out to the bigger community with a clearer image. Having a clearer brand will help attracting more users and donors, thus allowing PYC to grow and better serve the community.

Project Vision

The student team’s vision was simplifying the existing information structure and creating a user friendly website. By reorganizing the complicated information structure of the original website, the team would enhance clarity and information coordination. By doing so, the team aimed to strengthen the organization’s brand so that visitors can have clear understanding of Pittsburgh Youth Chorus’s image and purpose.

In order to satisfy such vision and create sustainability, the team decided to implement WordPress, a content management system that is widely-used. WordPress allows anybody to easily work with websites, even with no programming experience. In addition, it offers numerous features, which

meet different needs such as e-commerce and search engine optimization. In summary, the project's vision was to create a website which is user-friendly not only to visitors, but also to future administrators.

Project Outcomes

The project involved multiple teams working together towards creating a new website: student designer from the Pittsburgh Art Institute, database developer of Dedication Technologies, and PYC administrative staff. With basic design from the Art Institute and comments from PYC, the team was able to develop foundational structure of the website. The team continued by gathering content provided by PYC staff and publishing them on the new website. Further changes were made with feedback regarding the design and functionality.

Project Deliverables

The team's main deliverable was the new website integrated with the WordPress content management system. The major work was done in restructuring the overall website from the original design. The team emphasized on enhancing simplicity in order to capture visitor's attention and offer easy-to-find navigation. The team implemented analytics early on and used this information in creating an information hierarchy. In addition, the team integrated PayPal within the website to enable safe donation and e-commerce functionalities. In addition, online registration forms for auditions and events were built in order to alleviate administrative staff's work of communicating with users and deciphering their handwriting.

Recommendations

Although the team has made a significant progress during the project time, there were other possible opportunities that were not addressed due to the scope of the project. While the team is aware of ongoing development of new database system for the new website, the team still recommends not to hesitate to purchase new system since centralized database will significantly simplify the current business process and bring value to the organization. Furthermore, the team recommends the use of analytics to drive content as well as get more staff involved in the editing process in order to create familiarity with the WordPress system.

Student Development Team

Chris Compendio led project management duties and documentation through weekly sprint reports. He is a third-year Information Systems major with an additional major in Creative Writing.

Kang Jun Park was responsible for quality assurance and being a technical lead, along with being the primary client liaison. He is a third-year student in Information Systems and looking toward a career in technical consulting.

Sam Walczak led quality assurance for the project and was the primary lead for testing. He is a third-year double-major in Information Systems and Chinese Studies looking towards a career in technology consulting.

Accountability

Executive Summary

Community Partner
Professor Raul Figueroa
Student Development Team
Alice Borie
Cindy Lai
Sangha Lee
Duncan McIsaac

Background

Raul Figueroa is a recent graduate of the Carnegie Mellon University Engineering & Public Policy PhD program. He resides in Nairobi, Kenya and is heavily involved in the architecture and construction industry there. Dr. Figueroa is passionate about safe construction practices and spent his time at CMU researching ways to effectively enforce safe construction practices in Kenya. Dr. Figueroa outlined his vision for this project in his dissertation. Eric Muga, a professor teaching Information Systems and Finance from Strathmore University in Kenya, that is taking on the development of the application at the end of the semester.

Project Description

Project Opportunity

In last 7 years, 19 buildings in Kenya have collapsed due to poor construction, killing over eighty people and injuring 290 others. Poor construction in Kenya doesn't come from a lack of resources but from poor distribution of power and responsibilities on a construction project. When building project owners hire contractors, they offer most of the payment upfront, which enables and incentivizes contractors to reduce the volume of concrete and steel used in order to cut costs and increase profit. To address this problem, our team built an application that provides a persistent source of motivation for following safe construction standards.

Project Vision

The team built a mobile friendly web application that construction industry workers can use as a means for quality control. This application forces engineers and quality assurance specialists to complete structural tests on individual building components. The application makes this information available to all users associated to a project and helps the project owner from being blindsided about potential building collapse risks.

The application the team built is comprised of a strong visual front end so that engineers would have no difficulties using the system. The system is designed in such a way to prevent cheating when importing project information and completing tests. With this application, construction professionals are able to see which engineers and architects have a history of safely constructed buildings.

Project Outcomes

Product: A custom Ruby on Rails application, named “Accountability”, that runs a MySQL database. This application works well on mobile and desktop devices.

Process: Our team held weekly Skype meetings with Dr. Figueroa to gather requirements and clarify concepts. The team followed an agile development methodology, iteratively gathering requirements, designing, and developing the application.

People: Our team worked with Dr. Figueroa to create a list of skills and qualifications the future developer would need to have in order to successfully maintain the application. Based off these qualifications, Dr. Figueroa hired Mr. Muga to continue the development of this application. The team shared clear documentation that contains information about the development of the application and next steps Mr. Muga should take.

Project Deliverables

1. A private Github repository of our Ruby on Rails application.
2. A documentation folder containing supporting development materials.
3. DigitalOcean account with configured development server.

Recommendations

Recommendations for client

- Implement additional requirements (see Final Report for details)
- Maintain a consistent amount of development
- Test the application for production

Recommendations for future student teams

- Compare long term schedules with your client
 - Be ready for changes in requirements from the client.
-

Student Development Team

Alice Borie served as project manager. She is a rising senior with a major in Information Systems. She is graduating in May 2016 and her career interests include project management and front-end development.

Cindy Lai worked as a backend developer on the project. She is a rising senior with a major in Information Systems graduating in December 2015. She will be interning at Deutsche Bank.

Sangha Lee worked on backend development and quality assurance. She is a rising senior with a major in Information Systems and minor in Statistics. Her career interests include security and big data.

Duncan McIsaac worked as a frontend developer. She is a rising senior in Information Systems with a minor in Human-Computer Interaction. He is graduating in May 2016 and his career interests include full stack development, interaction design, data science and web application security.

Best of the Batch: Project C.H.U.C.K.

Executive Summary

Community Partner

Latasha Wilson-Batch

Student Development Team

Roei Curi-Hoory

Pranita Ramakrishnan

Siddarth Sivakumar

Allison Wilson

Background

The Best of the Batch Foundation is a nonprofit organization based out of Homestead, Pennsylvania that was founded by former Steelers quarterback Charlie Batch in 1999 and is currently under the leadership of Latasha Wilson-Batch, who serves as Executive Director. The goal of the organization is to aid financially challenged youths and their families by providing them with resources to help them achieve their goals. The general areas on which the organization's programs and events focus on are leadership, community, sports/recreation, education, and fundraising. Within these areas of focus, the organization has developed after school programs and scholarships, aided the community by restoring playgrounds, and offered sports and leisure activities.

Project Description

Project Opportunity

Project C.H.U.C.K. (Continuously Helping Uplift Community Kids) is a seven-week basketball camp during the summer where children from ages 7-18 develop discipline, self-confidence, team-building skills, and basketball skills. A major issue faced by Best of the Batch is that Project C.H.U.C.K.'s registration process has been paper-based. After parents/guardians write their child's details on a form, a member of Best of the Batch has had to manually input all participants' details (300+) into an Excel spreadsheet. With the number of children enrolled in camp increasing each year, this manual process is becoming increasingly laborious. While last year's Information Systems student team developed a system to spearhead the transition to an electronic registration process, there were technical issues pending in the system, volunteer registration was still done on paper, and other needed functionalities were not implemented.

Project Vision

The primary goal of this project was to ensure that the registration process for all parties shifted from a paper-based system to an electronic one. To do so, we redesigned the existing application infrastructure and developed a new comprehensive application. After learning about issues faced during the 2014 registration and speaking with both the client and former team, our project vision was also aimed towards bolstering the features of the existing system and developing new features to improve the experience for all stakeholders.

Project Outcomes

After gathering requirements, our team decided to build a Ruby on Rails web application with a Postgres database and deploy it on Heroku as it seemed most suitable for use on iPad devices during the three Project C.H.U.C.K. registration events. We chose to use the same tools and infrastructure that were used by last year's team to keep the application environment consistent for our client. In order to ensure the solution is sustainable, we used components for our system that the client had some prior exposure to. Our team focused primarily on the registration components of the application, building first the single-page participant registration form and then the volunteer registration form. We then added complete administrator functionality with login, followed by implementing additional features such as team and game management and pre-populating reusable information. By working with the client to introduce these new features and receive feedback, we have been able to build capacity for the client organization overall and improve efficiency of their existing processes. Intended future outcomes include less time and effort spent on registration, better organization of and access to information, and support for increased participant registrations.

Project Deliverables

The main deliverable to our client is the web application URL (projectchuck.herokuapp.com) along with the Git repository used and technical documentation. We will also provide credentials for the Amazon Web Services account, which is being used to store the images. Backup and dump files of the database will also be created and provided.

Recommendations

Our recommendations include the following: assigning a technical specialist within the organization, hiring a third party vendor to maintain hosting and maintenance of new technologies including Heroku, and, going forward, building on top the new system rather than rebuilding again. We recommend that future CMU teams continue development of the application with the help of documentation provided so that the client has a sustainable solution moving forward. We also advocate a main focus on security before extending the scope of the new application.

Student Development Team

Roei Curi-Hoory served as a backend developer. He is a junior in Information Systems with an additional major in Business Administration. He will be interning as a technology consultant at Pricewaterhouse Coopers this summer.

Pranita Ramakrishnan served as the designer and front-end developer. She is a junior in Information Systems minoring in Human-Computer Interaction. She will be focusing on data visualization and analytics at her internship at Adobe this summer.

Siddarth Sivakumar served as a backend developer and source-code manager. He is a junior in Information Systems with an additional major in Business Administration. He will be a systems analyst intern at Intel this summer.

Allison Wilson served as a backend developer before focusing on the deployment and backup of the application. She is a junior in Information Systems minoring in Human-Computer Interaction. She will be interning in Business Intelligence at Giant Eagle's corporate office this summer.