



Information
Systems

67-373 Software Development Project

Executive Summaries

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Carnegie Mellon University

Dietrich College of Humanities
and Social Sciences

Executive Summaries

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Best of the Batch Foundation

Executive Summary

Community Partner

Latasha Wilson-Batch

Student Development Team

Annette Chen

Akash Kejriwal

Jeremy Lee

Background

The Best of the Batch Foundation, founded by former Pittsburgh Steelers quarterback Charlie Batch, is a nonprofit that serves to provide a space for underprivileged kids to build character and a sense of community through education and sports. Located in Munhall, Pennsylvania, the Foundation offers after school programs, summer camps, various scholarships and more that help kids succeed in all areas of their lives. The Best of the Batch attempts to equalize the playing field by providing constructive activities in a range of different areas in an attempt to build the qualities in kids that lead them to success.

Project Description

Project Opportunity

The Best of the Batch has two main summer programs, Project C.H.U.C.K. and Next Level Athletics. As these programs continue to grow, the foundation needs a way to keep track of the all kids in each program throughout the different seasons. In the past few years, CMU Information Systems teams have worked on creating a registration and scheduling system for Project C.H.U.C.K. Best of the Batch is expanding the number of programs they offer as well as the number of kids that partake in these programs. There is an opportunity for us to expand past years' projects to create a more robust, and bulletproof system with added functionality, including the addition of registration for Next Level Athletics and student study hall tracking.

Project Vision

The primary goal of this project was to rebuild and refactor the entire web application that previous IS teams had developed. After learning about the issues the client faced in previous years with usability and functionality, our goal became to create a web application that achieved a smooth registration process for Project C.H.U.C.K. and Next Level Athletics and to ensure the user interface / user experience of the application was well designed for both the admin and general user. We also envisioned that our system would support the easy addition of more programs as Best of the Batch grows and adds new programs to their repertoire.

Project Outcomes

Using past projects as a guide for our application, we began by generating a list of use cases and functionalities based on deficiencies the client identified in past projects as well and new feature requests. From this we started a new application from scratch using a new refactored database design. We created a fully functioning and bulletproof Ruby on Rails application, improving features on the Project C.H.U.C.K. side and implementing a new registration system for Next Level Athletics. In past years, the app was mainly used by admin; however we extended usability so the application is more user friendly for a wide range of users, including volunteers, coaches, and parents. We identified that the application would mostly be used on mobile devices and adapted the application to be mobile friendly. The application also updates information based on the certain year, saving old data but only showing relevant information. We intend that this new application will help Best of the Batch to better organize and increase efficiency when accessing their information.

Project Deliverables

The main deliverable our team is providing to the client is a web application hosted on Heroku. The web application encompasses two major programs that Best of the Batch runs, Project C.H.U.C.K. and Next Level Athletics. Amongst our deliverables, we are providing documentation for both future teams to continue working on the project as well as documentation for the client to use the web application.

Recommendations

Best of the Batch is a continually expanding the organization to meet more students' needs. By embracing technology to help manage their information, they are able to continue their vision. We recommend that Best of the Batch look into working with a professional organization that can help meet their ever growing technological and information systems needs. This vendor can help maintain information integrity as well as provide support for current systems that are in place. If future CMU teams are brought in to work on this application, we recommend that they use the documentation provided and build upon the current system.

Student Development Team

Annette Chen served as back-end developer. She is a junior in Information Systems minoring in Human Computer Interaction. This summer, she will be a technology development intern at Capital One.

Akash Kejriwal served as a front-end developer. He is a junior in Information Systems minoring in Human-Computer Interaction. This summer, he will be a web development intern at Optoro.

Jeremy Lee served as the team project manager and helped facilitate various functions of the team to support the overall vision. After three years at CMU, Jeremy will be graduating this summer with a Business Administration minor.

Handprinter.org

Executive Summary

Community Partner

Gregory Norris

Student Development Team

Alex Frazier

Serene Gao

Meghana Valluri

Background

Handprinter seeks to instill a sense of environmental consciousness and influential power in individuals and organizations by allowing them to generate and monitor their positive contributions on the planet, also known as their handprint. To implement its mission, Handprinter creates an online community that allows users to work together to generate ideas for improving handprints and to evaluate their current individual handprints. By creating such a community, Handprinter harnesses the power of crowdsourcing to initiate a global movement for change.

Project Description

Project Opportunity

Since Handprinter is still in its early stages of development, our team has the opportunity to make a significant impact on the progress of the organization's primary product – the Handprinting Community. Through this community, individuals submit action ideas that they believe can increase their handprint. These ideas are then be upvoted by other users of the community. Simultaneously, highly-skilled users trained in life-cycle assessment or environmental science contribute by choosing to model action ideas into numerical equations. These models, similar to action ideas, can be graded based on accuracy and validity by other expert users. This creates opportunity for an eventual global suite of mobile applications to access the most upvoted action ideas and best corresponding models. Users of these outside applications can choose an action item they have completed, input in their specific usage or consumption statistics into the model, and calculate their individual handprint. Thus, while Handprinter is a social initiative targeted at increasing environmental consciousness, the mission, at its core, is driven by technology. Rather than focusing on systems that address potential organizational or information management issues, our team has determined that working to develop this Handprinting Community will create the most value for our client.

Project Vision

Our team's project vision is to build a seamless crowd-sourcing platform that allows submission of action ideas and includes a model generation interface that allows expert users to create a report detailing the description, variables, equation and documentation for an action idea. The primary users of our proposed project are both environmentally-conscious users as well highly-skilled individuals with necessary backgrounds in life cycle assessment and sustainability.

Project Outcomes

We have successfully developed a crowd-sourcing platform in the form of a Ruby on Rails web-based application that achieves our initial project vision and matches our client's requirements. Users can register into the Handprinter Community and submit action ideas. These action ideas can be commented and voted on. Users can train to become modelers, and then can model action ideas using a comprehensive form. Various versions of models are stored per action idea so that a detailed history of models is kept and easily navigable. Administrative users have the ability to change model statuses from 'complete' to 'ready to use', indicating that a model is sufficiently detailed to implemented in a calculation of a person's handprint.

Project Deliverables

We have live hosted our application at www.handprinter2.herokuapp.com. We have turned over a private GitHub repository to our client, as well as trained our client in use of the system. We have created a video that walks through all the functionality of the system, including the various user roles and capabilities. We have compiled a list of potential bugs and issues that developers might run into and recommendations for how to fix them. We have also detailed out all creative decision points and explained the justifications for them. Finally, we have compiled a project roadmap that explains the desired functionality of all future pieces of the Handprinting process. Lastly, we have documented our application code extensively for future maintainers of our project.

Recommendations

We recommend that Handprinter user-test the current application on their desired user-base and incorporate feedback as changes to the system. Following that, we recommend that functionality is added to the model-generation form to guide users to create clearer, well-formatted models. Finally, we recommend Handprinter perform a detailed assessment and functionality roadmap of their overall pipeline to guide their future work on this system.

Student Development Team

Alex Frazier was the technical lead. He is a third-year student majoring in Information Systems with an additional major in Statistics/Machine Learning. He will be interning as a cyber consultant for Deloitte this summer and is looking forward to exploring the depths of New York City.

Serene Gao served as design lead. She is a third-year double major in Information Systems and Statistics. She is currently working on her independent study about communal coping and diabetes management and is searching for a career in data analysis and visualization.

Meghana Valluri served as project manager and client advocate. She is a third-year student majoring in Information Systems with a minor in Business Administration. She will be interning as a Technical Project Manager at Apple this summer and is hopeful for a product management career.

Holocaust Center of Pittsburgh

Executive Summary

Community Partner

Lauren Bairnsfather

Student Development Team

Sid Malladi

Sarah Reyes-Franco

Emily Su

Background

The Holocaust Center of Pittsburgh was founded as a non-profit organization in 1981 to honor the survivors of Pittsburgh and share their stories. They found their permanent home in 2015, where they hold a library, offices, and showcase for artifacts, classroom, and multimedia gallery. With this permanent space, the Holocaust Center has the opportunity to create and house original exhibitions, as well as events that tailor to multiple interests, such as education, arts, and speaker series.

Project Description

Project Opportunity

The Holocaust Center currently is unable to properly track visitor information and event attendance. The staff has tried different methods such as a paper-sign in sheet and iPad version, but has faced issues such as loss of information and difficulty keeping track of a large number of attendees. Solving this issue through a digital system is important because the system would 1) make the check-in process at events and gallery walk-ins more efficient, 2) increase the center's ability to understand their visitor base, and 3) help make decisions for when the center should host events and open their gallery to the public. With better tracking of visitors and events, the center would have data to support decision making on what their visitors are interested in, when their popular hours and events are, and be able to program more tailored events to their visitor base.

Project Vision

We proposed to create a CRM system that allows attendees to check-in with the center's events and galleries, and a way for visitors to provide more information about their interests in the Holocaust Center through a follow-up email. From a visitor's standpoint, they would be able to quickly enter their email, first name, and last name. After a visit, visitors would be sent a link to complete additional information such as age and what their specific interests are. This allows the center to view analytics of their visitors and events, such as popular times and days of the week, and demographic information about their visitors. From a staff member's perspective, they will be able to upload a pre-registration sheet and their existing Mailchimp subscribers to quickly look-up previous visitors of the Holocaust Center and checking them in a few seconds. With this information stored digitally, the center will be able to pull tangible data in order to make decisions about events and appeal for funding.

Project Outcomes

Our team created a check-in and analytics system for the center to keep track of visitors and view information about events and visitors. We also implemented a follow-up email system to give visitors the option to complete their profile for more targeted events tailored toward their interests. We created data analytic pages to include recommendations for the best time to have events, which will help with their operating hours and make staffing decisions.

We also worked with our client to create a new visitor check-in flow to make transitioning from paper to digital a smooth and efficient process. By creating two separate flows of pre-registration and new visitor, we were able to test our newly designed process at an event with over 400 attendees, helping them operate one of their smoothest check-in processes in the last couple years.

Additionally, our project has helped with the center's discussion about the possibility of creating a membership status for their visitors, as they would be able to appropriately track donor status and event engagement.

Project Deliverables

Our deliverables include a hosted, responsive website accessible from any device, documentation for staff and volunteer members on how to operate our system, and recommendations for future information system projects for the center.

Recommendations

The Holocaust Center should implement this recommendation because the system reduces check-in flow time, provides the opportunity to collect data about visitors and events, and most importantly, help the center's director make holistic decisions based on these analytics that would be much harder to be made with a paper system. In the long run, our system will increase visitor engagement, providing reporting statistics for an increase of funding, and make staff processes more efficient.

Student Development Team

Sid Malladi served as back-end developer. He is a third-year student majoring in Information Systems with minors in Business Administration and Physics. He will be interning at Yelp this summer as a Product Manager and is looking forward to leveraging advanced technology to solve challenging global problems.

Sarah Reyes-Franco served as front-end developer and analytics expert. She is a third-year student majoring in Information Systems with minors in Computer Science and Business Administration. She will be interning at Apple this summer as a Mobile Application Developer and is looking forward to designing and creating new technology that will be used by millions of people across the globe.

Emily Su was the lead designer on the project. She is a third-year student majoring in Information Systems and Human-Computer Interaction. She will be interning at Apple as a User Experience Designer and is looking forward to designing thoughtful, intuitive experiences from complex problems, as well as hiking in the Bay Area this summer.

CMU Professional Development Services

Executive Summary

Community Partner

Kim Abel
Sarah Emory
Adam Marks

Student Development Team

Travis Chambers
Richard Huang
Piyush Puri

Background

Our client for this project is the Professional Development Services at CMU. The organization is a crucial part of CMU and helps every employee including staff and faculty member acclimate to the university, fully understand their roles and responsibilities, and support the career growth of each individual. The main focus is to have all employees at CMU be prepared for the job and all its responsibilities, provide access to the necessary resources and networking available on campus, and invest in each member of the community to help them develop and grow.

Project Description

Project Opportunity

Professional Development Services consolidating their copious amounts of professional development resources into digestible learning plans for CMU faculty and staff. They have developed “competency areas” to organize silos of professional development, each competency has an assessment to gauge your status in this area. A web application that allows faculty and staff to take assessments for different competencies and view personalized learning plans would equip our client with a new tool to drive increased user engagement.

Project Vision

Our goal for this project was to build a robust, deployable, and scalable web application for Professional Development Services. Their new competency-centric initiative hinged on our application being deployed and usable. We began the project knowing a successful deployment was expected and adjusted our scope and feature set accordingly throughout the semester. Our biggest goals were a highly interactive assessment report and an intuitive admin-side for the application.

Project Outcomes

We have developed a working version of the proposed application that is currently in beta testing. CMU staff and faculty are able to access the web application, pick a competency area, take a quick assessment, and a report will be generated with a learning plan and resources that will help the user improve with that competency area. The user can then email or print out the assessment report so

they can view it at a later time to track performance. CMU PDS staff is able to login as an admin and make changes to the assessment as well as the resources available. On the admin side, PDS is also able to use our Excel import feature to pre-populate the database with existing data.

Project Deliverables

The final project is a Ruby on Rails web application, hosted on AWS EC2 (Amazon Web Services). This web app provides CMU's faculty and staff a competency assessment that they can take where a learning plan on emerging areas will be generated. The clients have access to both the Github repo and the Github organization of the code base as well as the AWS account that is currently hosting the application. The project also contains various documentation, both technical and user manuals, to help transition next year's IS team as well as help guide CMU PDS staff's interactions with the application.

Recommendations

For the future teams we see the integration of shibboleth and FocusU as two important steps in creating the fullest experience for faculty and staff who will use this application. Shibboleth will allow users to login and save their assessment results in the app rather than being forced to download and keep track of a PDF or a link to their assessment report. FocusU integration will allow a user to create a learning plan through the application and export it to FocusU. We have created documentation for future teams to review that detail the meetings we have had about these features. We also recommend future teams review our Github issue tracker as we have been noting all the features we did not have time to build and all bugs we did not fix.

Student Development Team

Travis Chambers served as the technical lead. He is a third-year student majoring in Information Systems. He will be interning at the New York Times this coming summer as an iOS developer and is looking forward to a career in software development.

Richard Huang served as project manager. He is a third-year student majoring in Information Systems with minors in both Computer Science and Business Administration. He will be interning at Two Sigma Investments this coming summer as a software engineer/product management and is looking toward a career that bridges the gap between technology and business.

Piyush Puri served as the client advocate. He is a third-year student majoring in Information Systems with minors in Software Engineering and Business Administration. He will be interning at Accenture this coming summer as a Consulting Analyst and is looking forward to a career in software engineering.

CMU Spring Carnival Committee

Executive Summary

Community Partner

Amalia Martinez

Stephen Clark

Student Development Team

Akshay Goradia

Bruce Lin

Rumby Wilson

Background

The annual Carnegie Mellon University Spring Carnival is a three-day event to create a relaxing environment for the campus community. The event is organized by the Spring Carnival Committee (SCC). It has three major components: Booth, Buggy and Mobot. The SCC puts together these events by supervising hundreds of students from different organizations.

Project Description

Project Opportunity

The SCC relies on Binder – a Ruby on Rails web application – during Booth to manage tools borrowed by students. While Binder has many useful features like waitlist, watch shift, downtime, and notes. While Binder has incorporated many useful features that received positive feedback from last year’s booth coordinators, there are minor issues to be fixed to avoid odd functional behaviors and to further increase efficiency and user interactions.

Project Vision

We propose to first robustly test the application models and fix the 6 high-priority GitHub issues that are bug and security related. We aim to use this as a fundamental version of the application that is stable and free of functional errors. The next step is to build a notification feature in conjunction with the existing features to alert the users under different situations. For SCC members, the notification feature alerts them when a note is posted to a member. For student users, the feature alerts them when a requested tool becomes available, when a watch shift is imminent, and when organization starts downtime.

Project Outcomes

Following our project vision, we built an enhanced Binder with notification feature, as well as a stable version without this feature as a fail-safe should any unpredictable incident happen over carnival. Both versions proved to be quality. Although the enhanced Binder was shut down during an emergency, our client indicated they were overall very happy with notification feature. For example, they spoke highly of the note scenario because they receive a text message whenever a note is posted to them, claiming this feature the most useful improvement. After shutting down

notification, our client rolled back to our fail-safe version of Binder. They were happy with this version as well. Every year, SCC holds a post-carnival review to discuss its performance. Usually Binder errors is on the spot light because of functionality problems. However, Binder was only briefly mentioned this year because of its stable performance during carnival. As our client said, they had the least amount of problems with Binder this year.

Project Deliverables

Our project is a GitHub open source project. The source code can be found here: <https://github.com/sc0v/binder-app>. Note that the “Master” branch contains the deployed code during carnival. The “17/goat/main” branch was the primary development branch and the “hot-fixes” branch was used by our client and us for emergency purposes during carnival.

Recommendations

Although notification feature was proven useful, some student users were surprised when receiving text messages. A misfired text message to the wrong student faced angry reaction, which led our client to shut down the notification system. Therefore, it is highly recommended to do stress testing on the notification system to simulate real-time situation. Our team also explored a keyword response feature where student users can reply to our message (i.e. take themselves off the waitlist by replying “cancel”). This could be further expanded upon to increase efficiency. Finally, there are improvements to be made for user interface / user experience. For example, notify every student once they sign the waiver that they will receive text messages from SCC. This will reduce confusion among students when they receive a text message under certain situations.

Student Development Team

Akshay Goradia took charge of development roadmapping and creating sprint reports. He is a third year Information Systems major with a double in HCI.

Bruce Lin took on the responsibility of quality assurance in addition to notification development. He made sure codes pushed to the development branch are functional, before approving the code.

Rumby Wilson took charge of general project manager responsibilities and notification testing. She is a third year Information Systems with a minor in Global Systems Management and is looking towards a career in consulting.

San Francisco Department on the Status of Women

Executive Summary

Community Partner

Herschell Larrick

Carol Sacco

Student Development Team

Connor Hanley

Amber Hu

Helen Kim

Sina Siddiqi

Background

Established in 1998, the San Francisco Department on the Status of Women (SF DOSW) was the first department in the United States to adopt the UN Convention on the Elimination of All Forms of Discrimination Against Women to advocate for the women of San Francisco. Their work focuses on three major areas: Women’s Human Rights, Violence Against Women (VAW), and Women in Workplace. Of the three, our team worked specifically with the VAW Prevention and Intervention Grants Program, which provides funding to 39 community-based programs from 27 different grantee organizations in San Francisco to provide essential violence prevention and education for women and youth who are survivors of domestic violence, human trafficking, and sexual assault.

Project Description

Project Opportunity

Each of the funded programs is required to submit quarterly reports on their performance, as well as empirical data on how they use the grants. Currently, all reports and reminders are passed through emails which lead to scattered files that risk becoming lost in the midst of these transactions. After gathering these reports individually, they must be renamed and organized into a specific naming system and directory in order to be processed through the Master Excel for the annual reports, leading to a laborious, unsustainable process.

Project Vision

After extensive research into pre-existing solutions and custom build options, our client and our team determined that the best solution would be to build a custom built web application to optimize the report submission, management, and storage procedure. The app would allow the grantee programs to submit the required report for the current quarter and allow our clients to store these submissions on the cloud for easy extraction at the end of the fiscal year. When grantee programs submit their reports, the app would rename the file appropriately and sort them into the relevant folders, reducing the manual labor on both our client and the grantee programs. The app should also allow our client to filter through the submissions and create custom downloads based on the files they need to reference. In addition to the web application, we also wanted to refactor their existing Master Excel to become more dynamic and sustainable based on the modified file directory system.

Project Outcomes

We are pleased to report that we were able to deliver our clients the promised custom application. The web application has been thoroughly tested by both our team and our clients through multiple iterations and is ready to be used starting with the upcoming fiscal year. All current users, such as the SF DOSW admins and interns, as well as pre-existing grantee programs and their respective users have all been entered into the system, so they each have their own log-in credentials. Each user role has a different level of authorization to ensure privacy and security in the information that is made accessible for each user. Basically, grantee organizations can submit their reports through their dashboard, admins and interns can download and check on file submissions, but admins also have extended abilities that aid the management of data. Additionally, the Master Excel has been reformatted to be much more dynamic and versatile.

Project Deliverables

We delivered a web application, pre-populated with the current grantee organizations and SF DOSW staff information, as received from the SF DOSW. Additionally, we delivered the following: admin credentials, all the project components set up under the SF DOSW name, updated Master Excel, application manuals for the different level of users, and additional recommendations that the SF DOSW should consider moving forward.

Recommendations

Although the pain points regarding report collection and management have been addressed through the web application, in order to conduct more robust analysis of their collected data, adjustments will have to be made in the report form. Once the form is refactored, the app can become expanded to contain the form and grantee organizations can enter in the information directly and our clients will be able to save the data and run more dynamic queries through the application.

Student Development Team

Connor Hanley served as the back-end developer and QA manager. He is a third-year student majoring in Information Systems with a minor in Computer Science. He will be working for Apple Inc. this summer as a systems designer.

Amber Hu served as project manager. She is a third-year student majoring in both Information Systems and Business Administration. She is seeking a career in Asset Management or Operations Consulting after graduating from CMU.

Helen Kim served as the client liaison and the documentation lead. She is a third-year student majoring in Information Systems with a minor in Human Computer Interaction. She will continue pursuing her interests in UI/UX design after graduation.

Sina Siddiqi served as the lead front-end developer and UI/UX designer. She is a fourth-year student majoring in Information Systems with a concentration in Human Computer Interaction. After graduating this year, she hopes to enter the education technology field and focus on creating technology for children with special needs.

Beaver County Humane Society

Executive Summary

Community Partner

Donna Bucek
Karen Dioguardi
Shannon O’Neill
Susan Salyards

Student Development Team

Daniel Graf
Pooja Penninti
Hanson Zeng

Background

In 1950 Lois Glenn Wolfe and a group of friends decided to open the Beaver County Humane Society after witnessing how the dumping and drowning of animals became the norm once owners no longer wanted them. As an animal rights advocate, Beaver County Humane Society provides opportunities for locals to volunteer as dog walkers, drivers, foster caretakers, retail store clerk, cleaners, fundraisers among other exciting activities. Additionally, Beaver County Humane Society assists families with pets through educational programs and through other philanthropic initiatives. The organization recently adopted a Foster Application to use in conjunction with the Chameleon system, to manage their foster program. CMU students from last year’s team developed the foster application, which BCHS successfully uses to manage their fosters. Currently, the foster application requires bug fixes and functionality updates which is what our team will be working on.

Project Description

Project Opportunity

Currently, the foster application requires bug fixes and functionality updates and so BCHS’s main problems are more directed towards refinement of the current solution rather than tackling a whole new problem. Most of their issues are dealing with small user issues that they have found over the past year while using their foster portal. These problems range from wanting portal notifications to the design of the current front end to issues with being able to reset a user’s password. With these issues, potential users will most likely turn away from the system and possibly fostering all together (which defeats the whole purpose of the system). With the improvements that we plan on implementing and overall, making the system more user friendly, we hope to prevent this loss of fosters and therefore help BCHS grow this part of their vision.

Project Vision

Our vision for our project will be to enhance the overall product left by last years team, in order to identify lingering problems with their foster system setup.

Project Outcomes

Over the course of our project, we developed new features and services for the client, while also improving the overall user experience for both the client and the potential users. These changes will allow them to be able to operate more efficiently and effectively. Because we changed the way that the sign-up form is presented, users are now able to sign up to be a foster in a much shorter time frame. As we also implemented an email notification system, fosters will also now be able to receive notifications regarding their application status. This same notification system will inform BCHS employees of whether they received a new application, thus allowing the client to have a smoother workflow when managing fosters. Lastly, we gave the old website a complete design overhaul, improving the user experience while also creating more fluidity between the BCHS website and the foster portal. Overall, our project improved the client organization's capability in managing fosters and in reaching more potential fosters.

Project Deliverables

At the project's conclusion, we will be providing technical documentation, design documents, and testing documentation in digital form in order to make future management and editing of the Foster Portal simpler. On top of these deliverables, we will also be deploying the current version of the Foster Application to the BCHS server.

Recommendations

We recommend that the client organization do a few things to maintain and sustain the solution that we have implemented. The first is having an IT professional review our documentation and understand how our application works with Chameleon in case problems arise. The second is using social media to raise awareness of the foster program and foster application to increase users.

Thank You

Finally, we would like to thank the BCHS Staff for a wonderful semester and for giving us the opportunity to work with them (and all of the animals).

Student Development Team

Daniel Graf served mainly as front-end developer. He is a fourth-year student majoring in Information Systems with a minor in German. He will be working abroad this summer through the Technical Consulting in the Global Community program while companies decide whether or not that they want to hire him.

Pooja Penninti was the project manager. She is a third-year student majoring in Information Systems with a minor in Business Administration. She will be interning at Ford Motor Company this summer as an Information Technology intern.

Hanson Zeng served as a quality assurance. He is a fourth-year student majoring in Information Systems with a double major in Statistics. He will be working at Deloitte after graduation as a Business Technology Analyst.

YMCA of Greater Pittsburgh

Executive Summary

Community Partner

Jennifer Bouchard

Todd Brinkman

Jim Needles

Deborah Pricener

Student Development Team

Jake Bittner

Eric Chow

Abdusamed Sherif

Glen Wise

Background

The YMCA is the leading nonprofit committed to youth development, healthy living, and social responsibility in the nation. The YMCA of the Greater Pittsburgh Area serves more than 90,000 individuals every year with programs including after-school care and childcare, outdoor camping, community outreach, sports, health and fitness, youth counseling and senior assistance.

Project Description

Project Opportunity

The YMCA deals with the difficulties that come with logging and managing data by pen and paper. Being able to log this information with tablets or phones, the fragility of paper wouldn't need to be worried about. Whether misplaced or tardy, the YMCA ends up missing grant funding without the proper reporting. Not having the pressure of misplacing these papers can be hugely beneficial and reduce major inefficiencies in this manual form of "data transfer."

Project Vision

Our vision is to provide YMCA staff members and volunteers a comprehensive attendance tracking system that provides an intuitive interface for entering children's attendance. This system will allow members of YMCA to quickly and easily take care of data entry for kids registered for their programs including sign-in and sign-out, along with important food information. With the information in one system ready to generate reports on the current status, volunteers don't have to keep track of sign-in sheets and employees don't have to tediously submit data to management systems. In the end, volunteers can focus more on their interactions with children and YMCA directors and other employees can cut out massive inefficiencies to their paper-based solutions.

Project Outcomes

With the completed attendance-tracking application, users of this system can successfully import program information, create and complete attendance sheets for each program, and generate reports on these sheets. YMCA members can use these reports to see how many kids attended each site, when they were signed in/out, and what snacks they received during the program. Additional features include one-click sign-in or sign-out, any-date attendance sheet generation, customized reports according to before-school, after-school, or summer programs, and reports that can range from any two dates selected. These new reports were designed according to the recommendations of Deborah Pricener and Jennifer Bouchard who will use these for data analysis of the programs.

Project Deliverables

We've delivered a full-stack Ruby on Rails application that is deployed using a Digital Ocean server. In addition, we've supplied admin credentials, procedures on transferring ownership to their personal Digital Ocean account, and an extended user guide found on the system.

Recommendations

We achieved our goal which was to build a sustainable application that was fully functional. For future teams, we recommend implementing a feature that sends emails to parents to set-up a child's sign-in/sign-out codes prior to the start of a YMCA program/camp. This would help the first day of the program run smoother and allow the parents to spend less time waiting in line.

Student Development Team

Jake Bittner served as the Quality Assurance representative by enforcing clear, concise coding standards and maintaining responsibility of the master code repository. He is a third-year student majoring in Information Systems with a minor in Business Administration. He will be interning at Argo AI this summer and is excited to pursue a career in software development or management.

Eric Chow served as the Community Relationship representative, helping to keep in communication with the client as well as lead the client meetings. He is a junior studying Information Systems with a minor in Business Administration. He is interning at Deloitte this summer in their CyberRisk practice. He is excited to pursue a career in technology consulting.

Abdusamed Sherif served as the Project Manager, helping the team stay on track by meeting deliverables milestones outlined by its project plan. He is a third-year student majoring in Information Systems with a minor in Business Administration. He will be interning at Procter & Gamble this summer and is looking toward a career in product management.

Glen Wise served as the DevOps representative, engaging in server setup and maintenance, ensuring proper security protocols are in place, and making sure every new update to the application goes off without a hitch. He is a third-year student majoring in Information Systems with minors in Music Technology and Russian. He will be pursuing his MS in Information Systems Management at Heinz College next year.

Software Engineering Institute

Executive Summary

Community Partner

Chase Midler

Satya Venneti

Student Development Team

Asawari Kanitkar

Divya Mohan

Katie Williams

Background

A few years ago, researchers at CSAIL, MIT published a seminal paper on Eulerian Video Magnification, a process by which it is possible to visualize the human pulse from video. This was accomplished through the use of computer vision techniques to track the user's face and signal processing to extract heart rate estimates accurate within five beats per minute. The Software Engineering Institute (SEI), a federally funded research and development center headquartered on Carnegie Mellon's campus, has iterated on MIT's research to produce a prototype that extracts a heart rate from the frequency of light reflected off of a user's face.

Project Description

Project Opportunity

The SEI seeks to extend their prototype for demo purposes and solicit feedback from users. The technology currently exists locally and requires the client's machine in order to be demonstrated. Consequently, use of the technology is restricted to in-person meetings with the client. Our client's mission is to demonstrate and make this technology accessible to a larger audience.

Project Vision

Our project is the first step towards deploying the prototype by providing heart rate analysis through a live demonstration of our client's technology. The objective of our application is to allow anyone with a computer webcam to obtain their own heart rate by recording a video to be processed by our client's technology. This technology challenges the existing market for wearable health monitors by eliminating the need for costly devices and focusing on the sole use of video input through a non-invasive technique. With increased accessibility and development, the potential applications of this technology are numerous, ranging from aiding security screening measures to medical use in developing countries.

Project Outcomes

We created an interactive website that captures a user's heartbeat and maps it to their corresponding physiological status. Our interface coordinates with the client's algorithms to enable users to determine their heart rate in a few clicks, view rich visualizations of the resulting estimates, and provide feedback to further the technology's development and outreach.

Project Deliverables

Source code for our website is included in a GitHub repository shared with the client, along with extensive documentation of installation and execution. We also handed over documents detailing process work, design and technology decisions, current issues, and future plans.

Recommendations

Our client organization is highly technical by nature. However, any future developers on this project should have an understanding of WebSocket technologies, the facial recognition and tracking technologies employed, and JavaScript libraries used to graph the resulting heart rates.

It is also important for future developers to understand the project's long term goals, one of which is to be able to stream video and receive heart rate estimates in real time and another being the ability to process multiple requests to the client's server at once. We opted for WebSockets to scaffold this functionality but further development on the front-end and back-end is required.

Student Development Team

Asawari Kanitkar served as the Assistant Lead in Development. She is a third-year student majoring in Information Systems and minoring in Business Administration. This summer she will be working at Bank of America.

Divya Mohan served as Back-End Development Lead for the team. She is a third-year student double majoring in Information Systems and Human-Computer Interaction. This summer she will be working as a front-end engineer at Slack.

Katie Williams served as Design and Front-End Development Lead for the team. She is a third-year student double majoring in Information Systems and Human-Computer Interaction. This summer she will be working in front-end design and development at Apple.

Kodiak Island Borough School District Executive Summary

Community Partner

Damon Hargraves

Jethro Jones

Student Development Team

Sebastián Guerrero Cárdenas

Chris Lewis

Sophie Zhao

Background

Kodiak Island Borough School District (KIBSD) is a rural, public school district containing seven City of Kodiak schools and eight Alaska Native rural schools. From their mission statement, KIBSD seeks to “*provide an educational program of the highest standard that empowers all students to achieve personal and academic excellence while developing their full potential as responsible, productive citizens.*” To practically meet this goal, the Kodiak Middle School has adopted a “Response to Intervention” (RTI) scheduling model in the form of an existing application, Pickr. On top of their normal semester schedules, students are able to register for 2-week long “tutorials” during their elective period. The innovative flexibility of tutorial time caters on the needs of each student, allowing enrichment or intervention when needed.

Project Description

Project Opportunity

KIBSD experiences issues with its scalability and usability of the current Pickr scheduling tool. It works for bi-weekly tutorial rescheduling, but is only being used by Kodiak Middle School. Other schools do not have access to this technology because it currently cannot be distributed and access instructions are unclear. With a distributable application that does not require complicated installation, Kodiak Middle School could disperse this application with all of Kodiak Island Borough School District or any school who is interested in utilizing RTI scheduling.

Project Vision

After comprehending our client’s core problem with scalability and conducting extensive requirements gathering, we focused on modifying the current Pickr scheduling tool to be packageable and installable. We compared five possible solutions using a decision matrix - eventually proceeding by maintaining their original AngularJS front-end, re-building the CakePHP back-end with Node.js, storing data in SQLite, and packaging using Electron.

The interface and functionality of the application would not be drastically altered despite the change in development stack, making the application easier to adopt by the current users. Along the way, usability issues could be solved as noted by our community partners. Packaging and installation ability will allow distribution of this RTI scheduling tool to benefit other schools’ educational programs as well.

Project Outcomes

Our solution, Pickr2.0, is a custom-built Node.js application that runs on a SQLite3 database packaged as a desktop application that facilitates easy download and distribution for other schools to use. Since user interface was a prominent concern for our client, we managed to keep the current AngularJS front-end and connect it to our Node back-end maintaining the same user experience as the prototype application. With ease-of-use and replicability in mind, we ensured that our Pickr2.0 behaved akin to a native desktop app with clear, simple download and usage instructions. Our solution provides a robust RTI scheduling application that anyone can download and use. In alignment with Mr. Hargraves' overarching goal, Pickr2.0 can easily be distributed to any other school that wants to implement this type of curriculum, propagating KIBSD as an innovator in educational technology throughout the nation.

Project Deliverables

The final packaged application is hosted on GitHub Pages (kibsd-tech.github.io/Hosting-Pickr) has been sent to Mr. Hargraves for use in Kodiak Middle School and distribution anywhere else. In addition, we transferred ownership of Pickr2.0's GitHub repository which includes extensive technical documentation.

Recommendations

Moving forward, KIBSD can begin using the delivered solution within their own school district and distribute this innovative scheduling tool to other interested school districts. KIBSD has impactful ideas for future development and we recommend building on top of Pickr2.0 to implement additional features, such as Windows and Linux integration, attendance marking functionality, automated A/B lunch scheduling and more. We valued our experience working with our community partners and KIBSD and would recommend future CMU IS - KIBSD partnership to continue development on the Pickr2.0 scheduling tool.

Student Development Team

Sebastián Guerrero Cárdenas served as the team's QA and technical lead. He is a third year student double-majoring in Information Systems and Human Computer Interaction, and will be interning at Microsoft this summer. Sebastián is interested in software engineering at Airbnb.

Chris Lewis served as the team's project manager and back-end developer. He is a third year student double-majoring in Information Systems and Business Administration, and will be interning at Aetna Life Insurance Company this summer. Chris hopes to pursue a career in consulting or business strategy.

Sophie Zhao served as the team's client liaison and front-end developer. She is a third year student majoring in Information Systems with a minor in Business Administration, and will be interning at Wayfair this summer. Sophie aims to pursue a career in application development.

Phipps Conservatory

Executive Summary

Community Partner

Adam Haas

Sarah States

Student Development Team

Natalya Buchwald

Korrawat Jianthanakanon

Ally Sorge

Johnny Wu

Background

The Phipps Conservatory is located in Schenley Park of Pittsburgh. The historical landmark continues to be an active part of the Pittsburgh community, educating and entertaining the public with various exhibitions and garden shows. Phipps Conservatory has been and continues to be a leader in Pittsburgh's sustainability efforts, with two of its building receiving platinum LEED certifications.

The mission statement of Phipps Conservatory is *“to inspire and educate all with the beauty and importance of plants; to advance sustainability and promote human and environmental well-being through action and research; and to celebrate its historic glasshouse.”*

Project Description

Project Opportunity

Our project opportunity is to provide the visitors of Phipps Conservatory an interactive and low pressure experience in climate change education. Through a technological solution, our team believes that we can engage various visitor demographics in this pressing issue. One crucial component of the mission of Phipps Conservatory is to promote human and environmental well-being through action and research. Therefore, given the current political climate and recent global environment changes, it is imperative to provide visitors with tangible ways to sustain our earth's well-being.

Project Vision

Our team's goal is to create an interactive, well-designed, and sustainable experience to educate visitors about climate change. Specifically, this experience is a environmental trivia game. The game includes an interactive map of Pittsburgh; this design choice relates to the primary demographic of the visitors of Phipps Conservatory, Pittsburgh natives. This game is visually impressive, with custom designed graphics. Additionally, the game follows the Phipps style guide to coexist cohesively within the conservatory. This game is accessible to various ages, targeting specifically the seventh grade level. Furthermore, this game will be stationed at the halfway point of the typical visit, ensuring the adequate amount of attention from the player.

Project Outcomes

The most important outcome is the climate change knowledge-base of the general Phipps visitor. After gaining environmental knowledge from our game, our program will store the accuracy and time of each trivia question answered. Eventually, our program will have the ability to determine if the climate change knowledge based of the general visitor has improved over time. Secondly, our team comprehensively tested our game's interactivity and engagement level with over fifty people. We hosted one round of employee visitor tests to engage the Phipps staff base in our project. Afterwards, we conducted three rounds of on-site visitor tests to see our solution in context. These tests were crucial in our development and perfected our game's user experience. Furthermore, another outcome is our game's sustainability. Through our thoroughly collaborative process, our clients at Phipps have a firm grasp on how to continue to expand our team's creation. There are opportunities for more trivia questions and visual graphics to account for the growing climate change research.

Project Deliverables

Our team will provide our client the fully deployed game. We also will provide full access to the repository, currently located on GitHub and Heroku. This access will allow our client to sustain the long-term relevance of our program. Lastly, our team will provide a clear and detailed tutorial on how to sustain our program, including how to create and edit content for the game.

Recommendations

In the future, our team recommends Phipps to maintain the relevancy of the trivia game with periodically updated content. Additionally, there are opportunities to expand the interactivity and the gamification of the program with new features. These features may include motivational gamification strategies and further external incentives. We recommend that our client maintains our deployed application by regularly checking the condition of the repository to ensure positive game experiences.

Student Development Team

Natalya Buchwald served as the client manager and designer. She created the customized graphics for the trivia game and general layout. She will be continuing her technology consulting experience at CapTech in Richmond, Virginia this summer. Natalya foresees a career in socially conscious technologies, design, and consulting.

Korrawat Jianthanakanon served as the project manager and front-end developer. Last summer he interned at DBS Vickers Securities. Korrawat looks forward to a career in application development and user experience design.

Ally Sorge led the front-end design and development. She will be finishing her degree at CMU this summer while job searching. Ally hopes to continue working on similar social and environmentally conscious projects in the future.

Johnny Wu led the back-end development and oversaw all quality assurance in the project. He will be a software engineer at Wayfair in Boston, Massachusetts this summer.

Pennsylvania Resources Council

Executive Summary

Community Partner

Omoye Aikhuele

Michael Stepaniak

Justin Stockdale

Student Development Team

Sai Dhulipalla

Rebecca Kern

Ziren Zhou

Background

Pennsylvania Resources Council, PRC, is the oldest grassroots environmental nonprofit in Pennsylvania whose mission is *“to lead and promote individual and collective actions to preserve Pennsylvania’s environmental resources for each generation.”* PRC works to meet their mission in a variety of ways, primarily through environmental education programs and waste management events.

Project Description

Project Opportunity

One of PRC’s services to the community is hosting the Recycling Hotline for the Pennsylvania Department of Environmental Protection. PRC receives calls from citizens across the state asking for recycling information on a variety of different items. This process requires data to be managed in two places: searching for a location near the caller where the item can be recycled and tracking caller information. The main problems in their previous process was that: (1) PRC’s information was stored in Excel spreadsheets making searching through their data hard to manage (2) The recycling locations are ever-changing and there was no indication of when data was last verified (3) Tracking calls and lookups both were two separate processes that used the same information, but required PRC to do double the work for each call.

Project Vision

Our proposed solution to these problems was to store PRC’s recycling hotline resources in a database from which they could easily retrieve, update, and verify information. This system would also contain the ability to record calls, thus streamlining their calling procedure. This would serve as an internal resource that could be used by all employees of PRC using the hotline and would allow information to be consistent, securely stored, and easily accessible across the organization.

Project Outcomes

Throughout the iterative consultation process, the application was deployed weekly for user feedback. Each week suggested changes and other newer features were added. During the semester, there were a list of features, bugs, etc. for us to implement that was consistently updated. These action items were ranked by importance of functionality to the overall application and completed accordingly. From low fidelity wireframes to our MVP to our final product, the user and the experience of taking a call and searching for what the caller had asked was prioritized. PRC worked with us closely to be sure that we were on the same page as we developed a solution to their problems.

Project Deliverables

Our deliverable is a web application built with Ruby on Rails that can record hotline call information in a spreadsheet, search for recycling locations in PA by county and zip code, and verify the integrity of the information in the database. We have preloaded the database with information from PRC's current spreadsheets and included the git repository containing the code, and documentation and tutorials about the system to help train future employees.

Recommendations

Although we have a large percentage of their Excel spreadsheets populated into our database, we highly encourage PRC to continue to collect, verify, and add more information to the database, since its value will only increase with more data. During this semester, our efforts were focused on building an internal tool that provides value for PRC employees, which is why our web app is not very public friendly. We advise future development to be focused on making the app public facing, which includes features such as account management, UI updates, using the Google maps API to display locations, and more. In addition, since PRC creates reports on the hotline, future teams should build visualization tools to help PRC better understand their user base.

Student Development Team

Sai Dhulipalla served as developer and project manager. She is a third-year student majoring in Information Systems with a minor in Business Administration. She will be interning at Salesforce this summer and is looking toward a career in software engineering or product management.

Rebecca Kern led as the primary project manager and a developer. She is a third-year junior majoring in Information Systems. She will be working as an intern at Capital One this summer focusing on mobile development.

Gerry Zhou served as the head quality assurance manager and played a huge role in the development process. He is a junior majoring in Information Systems with a minor in Computer Science. He will be studying at CMU this summer and pursuing a career in software development.

CMU Athletics

Executive Summary

Community Partner

Christine Scalise

Student Development Team

James Jameson

Hyun Hee Clara Kim

Andrew Wang

Background

CMU Athletics oversees the athletics department at Carnegie Mellon University. They are in charge of maintaining the equipment and facilities, organizing different sporting events, and fostering the wellness of students through recreation and physical activities. Their goal is to inspire leadership, teamwork, and resilience through their various programs and have a positive impact on the CMU community. Our community partner, Christine Scalise, is the Administrative Coordinator at CMU Athletics. She oversees the student employees at the equipment desk and fitness center in the Cohon Center.

Project Description

Project Opportunity

The equipment desk in the Cohon Center allows students, staff, faculty and guests to rent equipment for use in the athletics facilities. Currently, CMU Athletics manages their equipment rental with Google forms and an excel sheet. Student employees fill out Google forms with basic information identifying the customer and what equipment is checked out. This information is then stored in an Excel sheet and includes fields such as the customer's name, Andrew ID, email, and the equipment they have checked out. The equipment rental process has been identified as a potential area for improvement.

Project Vision

Our vision is to implement a web application that will increase the reliability and efficiency of the equipment rental process. With the planned web application, CMU Athletics will be able to reliably track who rents out what equipment and when the equipment is rented out. This will allow the organization to ensure that the equipment is returned and customer rental information is tracked. The student employees working at the equipment desk will also be able to improve the efficiency in which equipment is checked out and checked in. This will be done by reducing the human input and automating much of the information tracked in the system.

Project Outcomes

Our team has developed an equipment management system with the capabilities to check in, check out, and manage inventory in a reliable and efficient manner. The checkout process is now automated so that only available equipment is listed and have all customers with an Andrew ID pre-registered in the system. Also, to ensure efficiency, we've made it so that the check-in process can now be completed with just one click and the inventory process helps determine whether or not the equipment being rented is in fact in stock. Our team worked with both CMU Athletics and the IT department for Student Affairs during the process of development to ensure that the implemented solution would be sustainable. Capacity building with the people of the organization interacting with the application (administrators and student employees) also took place in the forms of user testing and training.

Project Deliverables

Our final deliverable is the equipment management system web application deployed on the development server for CMU Student Affairs. A private GitHub repository will also be delivered to the Student Affairs IT team. Documentation for the system and a manual on how to use the system from the employee and administrative sides will be delivered as well.

Recommendations

The next step in the process towards deployment of the application is to transition from the development server to the production server. Once the application is moved to the production server, it will be ready for use by the student employees. In the future, this application can be expanded further to incorporate other processes at the equipment desk in the Cohon Center. This could include a locker rental system as well as tracking of payments for desk services. Integrating all these different aspects and functions for the equipment desk can ensure that the organization is able to provide its services to customers reliably and efficiently.

Student Development Team

James Jameson served as project manager. He is a third-year Information Systems major and Business Administration minor. He will be interning at Applied Predictive Technologies as a Database Analyst in the summer of 2017.

Hyun Hee Clara Kim served as the Front-End Developer and designer. She is a fourth-year student majoring in Information Systems and Human Computer Interaction. She will be interning at Next Jump this summer and is looking toward a career in UI/UX design and web development.

Andrew Wang served as the Technical Lead. He is currently a third-year Information Systems major minoring in HCI and Media design. He will be doing full stack work during the summer, and is looking forward to gaining more experience working with web technologies.

Blue Sky Fund

Executive Summary

Community Partner

Paula Labieniec

Student Development Team

Jason Chen

Jordan Stapinski

Fang You

Background

The Blue Sky Fund is a nonprofit organization located in the Richmond, Virginia area. Blue Sky Fund works to provide urban youth students in the Richmond area with an opportunity to learn tangible scientific and leadership skills through field trips into the surrounding natural areas, accompanied by activities and lessons. In terms of a mission statement: *“The Blue Sky Fund seeks to provide transformational experiences to urban youth through outdoor education, giving each student a chance to discover themselves by actively engaging in the natural world.”*

Project Description

Project Opportunity

Both the indoor educational trips and outdoor field trips offered by Blue Sky Fund face challenges that would hinder the students’ learning experiences. Indoor trips sometimes end abruptly by unforeseen circumstances such as lockdowns and/or interrupted traffic. Outdoor trips could not always attract and direct the attention of younger students in their intended ways, and therefore could not guarantee the delivery of scientific knowledge. These problems make the use of the educators’ and students’ time less effective, and thus call for new technical solutions.

Project Vision

Through the Oppia platform, the team envisions an opportunity for Blue Sky Fund’s educators to create interactive online content to remedy time lost by unforeseen blockages on field trips. The Oppia interactions, both the existing ones and the new one the team customized based on the client’s course design, would provide quick and simple methods of creating innovative learning exercises for students. Students will have diversified learning experiences since not only they will have more opportunities to learn, but also will they learn at their own pace.

Project Outcomes

Our team delivered a hosted custom website including the new feature developed by the team to our client (blueskyoppia.appspot.com). The new feature should be included in Oppia’s next official release. We also helped Blue Sky Fund and Oppia’s developers’ community to establish communication, and developed tutorials and design documents for Blue Sky Fund and open-source community.

Project Deliverables

Our deliverables include a temporarily hosted website, tutorial documentations for Blue Sky Fund and a new feature, testing feedback and other design documentations for Oppia's developers' community.

Recommendations

Our recommendation for Blue Sky Fund on keeping the sustainability of Oppia is to maintain regular and effective communication with Oppia's open-source community. In this way, the sustainability of Oppia, both for Blue Sky Fund and for the open-source community, would be well maintained.

We also recommend future IS student team to first look into the design documentation that our team has developed. The future team may find these design documentations inspiring, highly feasible or relevant to their client's needs.

Student Development Team

Jason Chen served as a developer for the project, and contributed towards documentation and communicating with the open source community. He is a senior studying Information Systems with an additional major in Human Computer Interaction. He will be working full time at Intuit in August. His hobbies include photography, working out, and eating Taco Bell.

Jordan Stapinski is a junior at Carnegie Mellon studying Information Systems with an additional major in Human-Computer Interaction and a minor in Computer Science. Jordan has interned as a software engineer for Bank of America in 2016, and will be developing educational software at MongoDB in the summer of 2017. For this project, Jordan worked to help guide the vision for the client interaction, as well as contributed on the developmental side, working in Python, AngularJS, and HTML on the new interactions. Jordan also spearheaded the deployment of blueskyoppia.appspot.com. In his spare time, Jordan enjoys playing trumpet as well as making time for sports.

Fang You is a junior at Carnegie Mellon studying Information Systems with an additional major in Statistics and a minor in Philosophy. Fang was responsible for producing the team's managerial documents and tutorial documents for Blue Sky Fund. She also worked closely with Blue Sky Fund's liaison to test the current version of Oppia.

Auberle

Executive Summary

Community Partner

Suzi Rosati

Student Development Team

Erin Dieringer

Matt Gruber

RhoEun Song

Background

Auberle, a faith based Catholic agency, is a family and child service agency dedicated to serving the community, creating strong family relationships and serving youth in need. Auberle serves over 3,400 at-risk children and families annually across eight counties in southwestern Pennsylvania. They offer a total of 16 programs including preventative and community-based services for children and their families. The team specifically worked with the Auberle foster care program and Suzi Rosati, the Director of Foster Care.

Project Description

Project Opportunity

Based on the organization's current practices of communication and data management, the main problem the team identified was how Auberle tracks and manages foster care information and records. Auberle employees make multiple trips a day across Allegheny county without any way of updating information regarding their trips in real time. This sometimes leads to overlapping trips in similar areas for multiple employees. Additionally, there is no centralized database or electronic spreadsheet template to track this information; it is primarily done through email and hardcopy paper submissions. Having an easy way to track these trips would save expenses on gas mileage, vehicle costs, hourly wages, and would most importantly allow other aides or specialists to cover additional trips. Solving this problem would not only give Auberle greater control over the management of case transports, but could also improve potential scheduling conflicts with real-time information.

Project Vision

Our goal was to create a scheduling system that can be integrated through a responsive web application. The system would consolidate all children's schedules into one system that can be updated by case specialists and admins, and accessed by case aides. Based on the children's schedules and the planned trips for the case aides, the system would be able to notify employees of canceled trips, when help is needed, and when schedules are submitted for approval to the administrators. We created our solution using a Ruby on Rails application hosted on an IS department server, *cmuisprojects.org*, with a server provided by Auberle's third party IT vendor (Ideal Integrations). The stakeholders for our application are the Foster Care Director, Ideal Integrations, the Director of Facilities and Operations, case specialists and aides, along with foster

families and children. Our users are the Foster Care Director - Suzi, case specialists, case aides, and case managers.

Project Outcomes

We have developed a responsive web application using Ruby on Rails that serves to manage not only real-time trip information, but also to manage the children's overall information and employee's schedules as well. Through extensive amounts of user testing at least every other week, we received insightful feedback that helped us prioritize features and iterate upon our interface design. Our project is also designed to decrease employee's time spent on writing mass emails notifying other employees of trip cancellations, trips without drivers, and trip reports.

Project Deliverables

Our deliverables to Auberle will be our deployed application, the repository to our application, and all documentation for the use and maintenance of the application including our final report. The application is our primary deliverable and we will provide Auberle with the URL and our code repository (through a zip file and GitHub repository). We will also give Auberle thorough documentation of how to use the application and how to maintain it (for technical professionals as well as the entire Auberle staff).

Recommendations

Due to our time restraints and the scope of this project, there were features and opportunities that we weren't able to implement. To further improve the value of our current solution we have some feature recommendations for future developers. These include algorithmic estimations of the exact travel time of trips, showing similar trips by calculation of the trip path and location, the ability to set reoccurring trips, and the ability to export the data and reports contained in our application into excel sheets or PDFs.

Student Development Team

Erin Dieringer served as project manager. She is a junior majoring in Information Systems and Human-Computer Interaction. She will be interning at Apple this summer and is looking towards a career in software development or project management.

Matt Gruber oversaw deployment and quality assurance. He is a junior majoring in Information Systems with a minor in Logic and Computation. He will be interning at Give Campus and is planning on beginning his career in software development.

RhoEun Song served as a client relationship manager and UI Designer. She is a junior majoring in Information Systems and Human Computer Interaction expecting to graduate in Spring 2018. She will be looking towards a career as a full-stack developer and UX designer.