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David Dick
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Development of a Mobile-Friendly Student
Self-Service Experience at Grand Rapids
Community College

By
David Dick
December, 2018

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David Dick

A project submitted in partial fulfillment of the requirements for the degree of
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Jonathan Engelsma

Date

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Abstract

Computer use reflects the development of technology from the powerful desktop computers, to portable laptops, to small handheld smartphones. Today users want the capability to perform tasks from anywhere at any time with any device. In order to meet these demands and stay relevant, organizations must adopt and implement updated technology. This project focuses on a need to adjust to the technological shift at Grand Rapids Community College. The college's self-service system, originally developed in the early 2000's, no longer meets the needs of the campus community. Especially mobile phone users were unsatisfied with the experience. To solve the problems with the current system, this project combined web development tools and new programming capabilities, recently added to PeopleSoft, to create a responsive experience for all users regardless of the device. The new interface was successfully deployed on November 12, 2018, and continues to serve the college community.

Introduction

The ability to provide an Internet portal to students was one of the reasons for the selection of the Student Information System, PeopleSoft, at Grand Rapids Community College. Since going live in 1998 the college has utilized PeopleSoft's Interaction Hub to provide self-service functionality to students, faculty, and staff. Over the last 20 years, the basic structure, content, and user interface design for the portal functionality has not changed. However, during those last 20 years, there has been a huge shift in the type of devices that different people employ to log into the system. Users access content from their smartphones, not just their desktops. In fact, from 2017 to 2018 alone, the PeopleSoft system at Grand Rapids Community College experienced a 6% increase in mobile phone traffic[3].

The goal of this project has been to address the need for mobile-friendly content at Grand Rapids Community College by creating a mobile-friendly interface for students. Through this project, most of the features of the portal were made mobile-friendly. In addition, as part of the transition to a mobile-friendly interface, Grand Rapids Community College adopted some of the mobile-friendly pages developed by PeopleSoft for students. Finally, this project created additional features for students such as a direct link to Blackboard and a secure file submission feature.

Background

As a community college, Grand Rapids Community College provides access to education for about 14,000 students across Kent County, Michigan. As such, providing students with easy access to register for classes, view grades, and pay their tuition is important to the college. This project sought to provide an improved user experience by developing a mobile-friendly interface for the students, faculty, and staff. Corresponding with the timing of this project was a version system upgrade to PeopleSoft. As part of this upgrade, PeopleSoft provided several optional redesigns to some of its original functionality in order to make the content mobile-friendly. Desiring to create the best possible experience for students, I was asked to add the new content into the new design.

When performing the initial research of this project in the spring, I was informed that the new design interface I would be developing would be scheduled to go into production over the weekend of November 9, 2018. I began work over the summer and succeeded in developing enough of the content so that testing of the main functionality could begin late September. After testing by users across campus, the changes to the Interaction Hub were successfully deployed as scheduled.

In addition to the need for a mobile interface, some Department of Education regulations guided several of the decisions concerning some new functionality for the student experience. This involved creating a framework to allow students to submit content securely through their log-in instead of via email.

Particularly this content was developed with the view of being used for Financial Aid, but it was built so that it could be expanded to be used by multiple departments. Due to the timing of the upgrade and the need for user testing, this functionality was not enabled on November 12, but is scheduled to be deployed with the rest of the system soon.

Program Requirements

This project was built using the PeopleSoft[4] system at Grand Rapids Community College. PeopleSoft is divided into different products called pillars. This project utilized three of these pillars: Campus Solutions, Human Resources, and the Interaction Hub. The Campus Solutions system holds and processes student data. Similarly, the Human Resources system contains employee information. The Interaction Hub is a PeopleSoft system that acts as a gateway to view pages in the other PeopleSoft pillars. Development for student or employee functionality is performed in their respective systems and displayed via a web service call within the Interaction Hub.

The goal of this project was to develop mobile-friendly content with features analogous to the existing functionality used by students and staff. This allowed for a complete redesign of some of the content, while other pages remained similar to their initial design. Additionally, some new features were developed for use by students.

Implementation

For this project, I utilized two different proprietary software systems: PeopleSoft and ImageNow. I made this decision for two reasons. First, the data is already stored in the PeopleSoft and ImageNow systems. Although I might have been able to utilize the API functionality provided by both systems to develop an app for IOS or Android, both systems, also have the native programming capabilities needed to provide a mobile-friendly web interface. Secondly, both systems are already utilized throughout the Grand Rapids Community College infrastructure. By using these systems long-term support will be simpler for the college.

PeopleSoft has its own development framework for pages known as PeopleTools. This language, built on a mixture of Java and C++ libraries creates a powerful programming language. It allows developers to utilize libraries from both languages, as well as a variety of language-specific features. By utilizing PeopleTools,

users can access content from the PeopleSoft system and the underlying database. The content developed using this traditional or “classic” approach only displayed well on a desktop or tablet and was never mobile-friendly.

In the last six years, PeopleSoft has expanded this development framework to include capabilities to develop content for different sized devices, including mobile devices and tablets. This addition to the programming language allows the developer to create pages utilizing a variety of web design tools like CSS3 and JavaScript and web development frameworks including Bootstrap and Oracle Jet Pack. In addition, this supplement to the framework allows programmers to insert JavaScript into the page to interact with the user and page content in an asynchronous approach.

I have worked in the IT department for the last four years at Grand Rapids Community College, primarily dealing with system administration. Before starting this project, I had an introductory knowledge of the PeopleTools development framework. I had created a few minor pages for my work at the college, but I was unfamiliar with many of the capabilities of the language. Particularly I was unacquainted with the new features it provided. Through my work on this project, I have learned a tremendous amount of programming techniques with regard to the developing of both PeopleTools traditional pages but especially how to utilize these tools to create mobile-friendly pages.

Finally, part of this project consisted of providing students with a mechanism for secure file submission to departments across campus. For this feature, I utilized ImageNow[5], the documentation system at Grand Rapids Community College. I developed a framework inside of the PeopleSoft system that would allow students to drag and drop a file from their computer and upload the file securely to a specific department on campus. On the ImageNow side, I created a program to transfer the document from PeopleSoft to the correct department.

Results, Evaluation, and Reflection

I am very pleased with the results of this project because it accomplished the objectives set at the beginning of the semester. Additionally, it was successfully deployed into production by Grand Rapids Community College on November 12, 2018. It received a positive reception from the campus community. As part of the go-live, we did not advertise the mobile-friendly character of the self-service options. Despite that fact, as described in the appendix, over the first two weeks following the upgrade, there was a 2% increase in the amount of mobile traffic to the PeopleSoft System. I am pleased that more students are utilizing their phones to access their self-service functionality.

Upon completion of this project, about 80% of the self-service functionality utilized by Grand Rapids Community College is mobile-friendly. Of the remaining 20%, only two custom features developed by the college remain as not mobile friendly. The decision to keep these pages with the traditional interface, for the time being, was made for three reasons. First, these pages are for employees, not students, and therefore are a lower priority for the college to have redeveloped. Second, the purpose of these pages is

data entry in nature, and thus more suited for a desktop environment. Finally, these pages are more complex in nature and were deemed beyond the scope of this project.

The remainder of the functionality that is not yet mobile-friendly is a variety of vendor provided pages that either was beyond the scope of this project to setup and implement or have not yet been released as mobile friendly by the vendor. For these pages, the college does not want the overhead involved with creating a custom page.

This project allowed me to utilize many of the skills I learned over the years as a student. It involved accessing and designing database tables, working with web and mobile development, designing an intuitive user interface, testing and debugging my code. This project has taught me the importance of designing a page mobile-friendly first. With a small form factor device in mind, the design and content of a page can differ dramatically from a page designed primarily for a desktop. Font sizes, the location of buttons and other elements are so necessary when creating content for a variety of screen sizes.

Additionally, I was struck by the importance of testing early and often, on multiple devices, and by devices both behind and outside of the campus firewall. Frequent and early testing allowed me to catch many of the major bugs early on before they would have become too difficult to adjust in the development.

However, because of the school firewall, testing needed to be done on campus. This allowed a bug, to be introduced. Although that though it was quickly resolved, it remained undetected until after we went live with the new system.

This project also allowed me to utilize agile project methodology for software development. I used the tool ZenHub[6] to track the progress of the project. I divided my work for the project into six two-week sprints. For each sprint, I estimate what would be feasible to accomplish in the allotted amount of time. By the third sprint, I gained enough exposure to the development environment and other tools so that I was able to estimate the amount of work that would be appropriate for the next two weeks. I found planning out my weeks in advance and the agility offered by Agile Project Management to be very beneficial to the project and plan to continue to use the technique on a regular basis.

Conclusions and Future Work

Although not completely mobile-friendly, the fresh interface that has been deployed will provide students, faculty, and staff greater access to the online resources available to them at Grand Rapids Community College. Additional work needs to be done to complete the new user experience. Primarily this involves the implementation, setup, and configuration of the mobile-friendly class search and registration functionality that PeopleSoft has delivered. Similar changes could be made to the few remaining pages developed by the college that are not mobile friendly.

This project has given me a deeper understanding of two complex worlds: mobile-first development and ERP systems. Throughout this project, I was able to see the benefits of mobile-first development and using Agile Project Management methods. Change within an enterprise software system is often very complex and difficult to implement. As development companies such as Oracle continue to make updated design

changes to these systems, it is important for companies to adapt to these changes in order to stay relevant in this fast-paced competitive world.

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Appendix

The following data and graphics are from Google Analytics[7] data taken from on November 26, 2018, comparing the weeks of October 28, 2018 – November 10, 2018, and November 11, 2018, to November 24, 2018. In order to eliminate administrative users, the data shown is from off-campus connections only.

DEVICE	USERS FROM 10/28/18 – 11/10/18	USERS FROM 11/11/18 – 11/24/18
DESKTOP	7,876	8,176
MOBILE	2,793	3,216
TABLET	285	305

