Abstract

This project applies Lean concepts to a manual process at the Northeastern Center of Community Service. The capstone team has been working with the Center of Community Service from May 2013 through April 2014. During this time, the focus of this project is to utilize and implement Lean tools, human factors engineering, and value stream mapping concepts and tools, to transfer a paper-based manual process to an online modern information system. The online system will be used by all constituents of the Northeastern Center of Community Service including center staff, community partners, and Northeastern student volunteers who seek service experience and credit as part of their academic experience. The online system will be used for processing the community service partners’ request for partnership (RFP) application information. Lean methodology and value stream mapping will aid in streamlining and optimizing the current workflow of the RFP process of Northeastern’s Center of Community Service. The vision for this project is to apply Industrial Engineering techniques, online user interface concepts, and database and data mining knowledge to minimize the manual labor and time spent filling out and compiling the RFP forms to enable all constituents of the community service center to develop personal relationships with community partners. Currently, the online information system has been coded and developed for the RFP process and designed to be scalable for future growth. A usability test for the online information system has been conducted and analyzed which helped the team validate the design and usability and to measure process improvements.

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The Need for Project

Streamlining and optimizing the current antiquated paper-based workflow of the RFP process of Northeastern’s Center of Community Service will create a more efficient process.

The Northeastern Center of Community Service implements a wide range of programs and events to engage students in meaningful service with local communities. In order to make the appropriate connections between campus and community needs, "Request for Partnership", or RFPs, are created. Each program-specific RFP is distributed to 50-200 community partner organizations, most of which overlap between programs. Currently each program processes these RFPs separately by e-mail and ultimately a "paper" format. The information that the RFP provides is compiled by the staff into shorter forms that can be presented to students, so they are informed of the service options available to them. The goal of this project is to make the application process much more “user friendly” and to move the two largest programs (the Service-Learning and the Civic Engagement Programs) into an online system.

The Design Project Objectives and Requirements

The project objective is to create a web based information system for streamlining and optimizing the workflow of NU Center of Community Service.

Design Objectives

The first design objective is to create an optimized database design with the necessary schema and tables. A user friendly online system to serve the four main constituents: the staff, community partners, Northeastern faculty and the students is the second design objective. Ensuring that the information system can easily accommodate future needs and growth is an important design objective. The last design objective is to adapt an innovative methodology to apply traditional Industrial Engineering analysis tools to modern information systems.

Design Requirements

Several requirements must be met in order for the web-based information system to be considered successful. Crucial requirements include usability of the web-site and a reduction in the time it takes to complete the RFP process. The web-site must be easy to navigate and user friendly. Both the community partners and the Center of Community Service staff must be able to easily access all the information they need quickly and easily. The time it takes to fill out the RFP must be 10% less than the old paper-based RFP process. The Center of Community Service must spend 10% less on compiling the
RFP information than in the before state. Lastly, the information system must be expandable to accommodate students and faculty.

**Design Concepts Considered**

Three initial design paths were initially based on a large scope that the team narrowed down to one; 4 coding languages were selected from a list of 6 considerations.

The project started with many potential solution paths. The scope presented to the team consisted of three main path ways; the student matching process, the Request for Partnership process, and the faculty side. The team narrowed down the scope of the project to focus on the RFP Process and creating a portal for the center. The team decided to approach the problem using Lean tools and methodology. This approach was chosen based on the needs of the Center of Community Service. The Center of Community service has never experimented with lean tools before and the team decided that innovative lean solutions would be the best opportunity for eliminating waste and increasing capabilities at the center. After thorough current state analysis involving meetings with the Center of Community Service, the team knew the project could be very impactful. The team decided to create a web-based framework for optimizing and streamlining the RFP process and considered Page Breeze, Dreamweaver, Microsoft FrontPage, and eventually decided on Microsoft SharePoint Designer for the HTML editor because FrontPage is not longer supported by Microsoft. Coding languages such as HTML, Flash, PHP, JavaScript, CSS3, and Java were all considered and the team decided to use HTML, PHP, JavaScript, and CSS3. The team developed the database using MySQL instead of Microsoft Access because Access is a local database and MySQL is accessible from anywhere online.

**Recommended Design Concept**

The design is a web based information system for the Request for Partnership process at the Northeastern Center of Community Service.

The team decided to create a web-based framework for optimizing and streamlining the RFP process with Microsoft Office SharePoint designer and MySQL for the open source database.

**Design Descriptions**

The team first developed the database using MySQL to store and organize the RFP information and then created a user friendly interface using Microsoft Office SharePoint designer. The web-based framework combines a front-end interface and back-end database for the RFP process. The online information system will help the center interact
electronically with partners to solve the problem of compiling and updating information from the applications in a paper-based format.

The group completed the Community Partners portion of the process (the pink section of the figure on the bottom) and the page for the center to extract the necessary information. The Student and Faculty sections are the portions that the team hopes will be expanded by a future capstone team.

The first page coded and designed was the home page. This page allows the center, partners, students, and faculty to navigate quickly and find the necessary information, contact information, and the RFP application. The page will include information about both programs and be found through the college of engineering server.

The second page constructed is connected to the community partner icon on the home page and is the sign in or sign up page. This will be the page that the community partners go to sign in with their user name and password or to register for a user name and password. This will help store and save data so both the community partners and Center of Community Service can access data and their application easily. The application includes links to answer examples to guide the community partner in their application process.

The final page developed is the extraction page for the Center of Community service which is accessible by the home page. The Center of Community Service will have unique login information. The Center of Community Service needs to be able to access all the information from the RFP in an organized matter. The team created different filters for the Center of Community service to extract data in a meaningful way for the staff based off the needs of the center.

**Analytical Investigations**

There are a few requirements that the information system must meet in order to be considered to be value add. The first is that the information must be stored and extracted easily by the community partners and Center of Community Service. The extract page allows the Center of Community Service to sort the data in multiple ways. The second is that the time it takes to complete the RFP must be less than the paper based format. A survey of community partners shows that the new web-based RFP process saves approximately 45 minutes.
Key Advantages of Recommended Concept

Through the web-based design, the team will eliminate the paper-based environment for the center of community service. The web-based user interface will allow the center of community service staff to focus on the personal relationships with the community partners. The new information system will save the partner and the center time which can be spent in a more useful way.

Financial Issues

At this time, the team does not have any financial issues.

There has been no cost accrued during this capstone project. The software programs used in the design were free to the public domain. In the future, if the center wants to expand the information system, they could resource another capstone team or outsource a MySQL expert.

Recommended Improvements

The team narrowed down the scope of the project to focus on only the community partner side of the RFP process. In narrowing this scope, the team created portals for the student and faculty side of the RFP process, but did not fully develop the front end and back end with coding. The capstone team will create a standard operation procedure for updating the information system with the intent of future capstone teams expanding the information system. The team designed the information system to be scalable in order to allow for future growth. The Center of Community Service supports the idea of having a student matching portal and a faculty portal on the site. The faculty portal will be for the Service Learning courses offered at Northeastern. The team and the center agree that the RFP application and the extraction of that information was the priority for this project.