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Milestone 1

Introduction

This paper will analyze three projects, reviewing a summary, project partners and users, engineering requirements, possible constraints, and recommendations for design and implementation. The three projects here are focused on web development and the creation or updating of a website and paired database to accomplish the desired functionality. The projects analyzed here are: 1. *The Oregon State Craft Center Tool*, 2. *Sparck Moto Commerce Website*, and 3. *NODE (National Open Data Elections) Project*.

1. Project 1: The Oregon State Craft Center Online Tool

The Oregon State Craft Center Online Tool will be used by craft center employees to automate tasks that are currently done manually by those employees. The tool will also incorporate legacy systems, with a focus on easing work needed for Oregon State Craft Center tasks.

1.1. Partners, Stakeholders, Users

The technical partners and stakeholders for this project are employees Oregon State University Craft Center. The focus of the Oregon State Craft Center is to provide tools, place and instruction to students engaging in crafts, be they artistic or practical, with an emphasis on supporting creative outlets. These partners have access to existing tools and software, and the Oregon State Craft Center has existed as service to students for many years while using those tools and providing services to students of the university. The users for this project are likewise Craft Center employees and ensuring its usability for them is important for the stakeholders.

1.2. Engineering Requirements

This project will require some form of database, as the tasks previously accomplished using paper will need to be recorded in a secure fashion. The database will need to support a variety of information depending on the number and scope of paper-based tasks it shall replace. The database must be secure, as much of the information used in the craft center is regarding specific students, which is not public information. Finally, some form of backup system should be implemented for the database, to ensure data is not lost.

This project also requires a web application which will contain the functionality. There must be a server available to host the application with good uptime in order to avoid a loss of service. The server should be easily accessible by any developers or maintainers, such that prolonged outages do not occur in case of any broken changes. The web application must also be able to consistently interface the database without timeouts and be able to rollback incorrect updates to the database. The web application must provide the ability to access legacy tools, either through a link or with an integration into the web application.

This project will also require a type of form management. The users shall switch from paper forms to a web application, and the functionality of the web application should translate from any paper forms. Thus, a method to create forms on pages of the web application and to access data entered into any forms is needed.

1.3. Constraints

The main constraints for this project are time and budget. Developing the web application, database and functionality of the application could take a significant amount of development time. Likewise, the budget for this project will largely be tied to time taken on development, but there is also a constraint in the budget for the server, along with any licensed software. Another constraint for this project would be device compatibility, an application developed for computer use would need significant additional development to be compatible with phones or tablets. Finally, there are complexity constraints for functionality on the website. An individual paper form with many fields may not be easily translatable into the web application, as it may run too slowly.

1.4. Recommendations for the Design and Implementation Team

Recommended skills necessary to complete this project are as follows: database management and creation, web application creation, expandable programming design, user fillable form creation, and website styling and functionality.

Additionally, the team completing the project would need to request a server on which to run the application along with a location to host the database. The team may require access to computers like those used in the Craft Center to ensure useful testing.

It is also recommended that the web framework, and database type are decided early on in development. Likewise, the team should investigate early on any legacy tools to gauge the feasibility of integration into the chosen web framework. Also, the team should consider methods to make the program easily upgradeable. These steps would require team members experienced with database and web application creation, along with understanding expandable programs.

After deciding on the framework and database, the team should work to create a basic application able to interface with the database, with a small amount of test functionality. This step would use members experienced with working on databases and web development. Next, the team should investigate and consider the functionality that should be implemented to replace paperwork and divide the implementation among the team members. Finally, the look and feel of the application should be considered and implemented once the functionality is in place. This final step would make use of both web developers and members with experience in modifying web page styles.

2. Project 2: Sparck Moto Commerce Website

The *Sparck Moto Commerce Website* is an overhaul of the existing Sparck Moto website. This project aims to upgrade and improve the website to bring it on par with other modern online websites in both functionality and style.

2.1. Partners, Stakeholders, Users

The project partner and stakeholders for this project are members of Sparck Moto. Sparck Moto is an organization focused on provided quality, local parts motorcycle parts to people interested in motorcycle maintenance and repair. These partners have access to the existing Sparck Moto website, along with knowledge of products and other services provided by Sparck Moto. The Sparck Moto partners are experienced with the needs of motorcycle enthusiasts. The users for this project are the motorcycle enthusiasts themselves. They are individuals with varying familiarity with the internet who have an interest in motorcycle maintenance.

2.2. Engineering Requirements

This project will require updates to the existing database to implement the new functionality on the website. The existing database may need security updates to accommodate new administrative functionality to ensure that the admin functionality is only used by authorized users. A method of storing product details in the database which allows for updates is also needed.

This project also requires a system to authenticate and track users and to ensure that passwords and user information are secure. Any authentication must be done server side to ensure no disallowed access occurs, and will be important to ensure product details are not edited unless a user is authorized. Along with this, administrative functionality should be implemented on applicable pages of the website.

This project also requires a method of interfacing with PayPal and must ensure user's entered information is secure when sending to the PayPal service. Any financial information sent should be encrypted immediately so as to avoid any security issues and ensure customer's data is not compromised by using the website.

This project shall also require a method of implementation that ensures functionality on all browsers and devices.

2.3. Constraints

The main constraints for this project are time and budget. Updating the web application and database along with adding new functionality and security features could take a significant amount of development time. Likewise, the budget for this project will largely be tied to time taken on development. Another constraint for this project is the existing database. Depending on the available space and version of the existing database, the work done to modernize the application may be constrained. Likewise, concerns around security may be an issue and an expert or a developer experienced in secure development may be required when implementing some features. Finally, there are possible constraints around the look and feel of the website. Well known modern shopping sites are the products of thousands of hours of development, and it will not be possible to complete updates comparable to a site such as Amazon.

2.4. Recommendations for the Design and Implementation Team

Recommended skills necessary to complete this project are as follows: database management, experience interfacing with eternal APIs, web development, security, and website styling.

Additionally, the team completing the project may require additional devices with which to test the application, such as tablets and smartphones with various operating systems to ensure the website is compatible with those devices.

It is recommended that the first task undertaken in this project should be to work with the technical partners and shareholders to determine the desired functionality and pages, along with a rough idea of features. This stage would involve all members of the team, to better determine what is possible to accomplish. The next stage should involve adding functionality for user authentication and database updates to allow for product modification, which would require team members with database, security, and web development experience. Next, the PayPal integration and layout of the updated site should be determined, which would require team members with web development, website styling and security skills. Finally, the website style should be updated to meet the requirements of the shareholders, which would involve team members with experience in website styling.

3. Project 3: NODE (National Data Open Elections) Project

The *NODE (National Data Open Elections)* project seeks to create a website which will allow interested individuals to provide information on elected officials in a public database, which will then be verified and provided to other users. This project is focused on making information easily available and centralized, while allowing anyone to contribute.

3.1. Partners, Stakeholders, Users

The project partners and stakeholders for this project are individuals with a strong interest in providing voters with information on elected officials. They are part of an organization which seeks to make information about elections and elected officials easily accessible and understandable by the average voter, and to increase engagement with electoral politics. The users of this project are citizens of the United States with an interest in politics. They are not associated with any particular political party and are of all demographics. They have varying degrees of familiarity with using websites and varying degrees of information about elected officials.

3.2. Engineering Requirements

This project will require some form of database large enough to store the information about various political candidates in the united states, to allow the information crowdsourcing users provide to be stored and shown to other individuals. The database will need to store data around individual elected officials and contain categories of those officials. The database must be secure, as the information provided will be verified and it is important that incorrect information not be inserted, and existing information not be deleted without proper authorization. Finally, some form of backup system should be implemented for the database, to ensure data is not lost.

This project also requires a web application. There must be a server available to host the application and database with good uptime in order to avoid a loss of service. The server should be easily accessible by any developers or maintainers, such that prolonged outages do not occur in case of any broken changes. The web application must also be able to consistently interface the database without timeouts and be able to rollback incorrect updates to the database.

This project will also require a method to authenticate users to allow for verifiers to look over submitted information. A secure method for users to log in with should be implemented. Likewise, a method for users to submit information should be implemented, and it should be ensured that information is not

lost after users submit it. Finally, there should be search functionality for the information, particularly by location, to allow users to easily access data.

3.3. Constraints

The main constraints for this project are time and budget. Creation of a new web application and database could take a significant amount of development time. Likewise, the budget for this project will largely be tied to time taken on development. Another constraint is the database for this project and the server required to host the application. These two requirements could be constrained by budget, as server use is an ongoing cost. Likewise, concerns around security may be an issue as it is important that users are correctly authenticated and unauthorized users cannot access verifier functionality. An expert or a developer experienced in secure development may be required when implementing some features. One more possible constraint is the verifying functionality. The ongoing cost of verifiers for the data may be a constraint, and if volunteers are used the accuracy of the information may be uncertain.

3.4. Recommendations for the Design and Implementation Team

Recommended skills necessary to complete this project are as follows: database management and creation, web development and website creation, security, and website styling.

Additionally, the team completing the project may require access to a server to host development versions of the website and database to ensure that functionality is working correctly.

It is also recommended that the web framework, and database type are decided early on in development. These steps would require team members experienced with database and web application creation.

After deciding on the framework and database, the team should work to create a basic application able to interface with the database, with a small amount of test functionality. This step would use members experienced with working on databases and web development. After the basic application is in place, the team should decide on the database format for storing data on elected officials, which would require a team member with database management experience.

Next, the team should implement user authentication functionality to ensure only registered verifiers can access relevant portions of the website, which would require team members with security and web development experience. After this, the team should work to implement pages for entering and displaying information from the database along with search functionality, using team members with web development and styling experience. Finally, the team should work with the shareholders to determine the look and feel of the site and implement styling accordingly, which would require team members with web styling experience.