C868 – Software Capstone Project Summary

Task 2 – Section A

Capstone Proposal Project Name: Appointment Scheduling Application

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Business Problem

The Customer

Anodyne Semantics Consulting (ASC) is a start-up consulting firm focused on serving the comprehensive needs of businesses in the full range of the business cycle. With a core staff of seven experienced professionals and a team approach to most consulting projects, ASC will be able to offer a more balanced quality service than many of its competitors.

Anodyne Semantics employees work with outside businesses to implement scheduling, contracting, and customer-service solutions. The length of these consulting sessions can vary from as little as an hour to open-ended contracts lasting for months.

Business Case

Currently, the employees of ASC utilize their own personal calendars incorporated with their Outlook email profiles to schedule consultations with prospective and active customers. This has led to communication failures between staff and customers, leading to scheduling conflicts and confusions, damaging the perceived professionality of the company.

To replace this ad-hoc scheduling system, the company requires a more centralized scheduling application. A solution must be created to allow visibility of currently scheduled consultations with clients, as well as creating, maintaining, and updating customer contacts.

Fulfillment

By utilizing a self-hosted web application, paired with a similarly self-hosted MySQL database, upcoming consultation appointments and customer data can be stored for all employees in a centralized and internally available location.

The website will have the ability to create, view, update and delete both customers and appointments. Additionally, reports can be readily created by any authorized user to view appointment information based on a time window of their creation.

Existing Gaps

The current policies and procedures in place for scheduling appointments call for employees to create ad-hoc appointments within their own email calendar. This has lead to duplicate appointments being created for the same customer by different consultants, as well as appointments failing to be created because consultants assumed another employee had already done so.

Additionally, the process of creating an appointment in the employees’ email calendar does not reliably allow for customer contact information to be gathered, confirmed, and updated when required.

Centralizing the customer information process will ensure that all consultants will be able to have access confidently and consistently to the most up-to-date contact information for existing customers.

SDLC Methodology

The Waterfall Method will be used for this project. The relative lack of complexity required for this project lends itself best to the more simple and focused approach utilized by the Waterfall Method. The requirements are fully known to the company, so the more iterative approach of Agile Methodology would likely be redundant and wasteful.

Requirements Phase

The Requirements Phase begins with an investigation of the specific needs of the client. Developers will work closely with managers, users, and key stakeholders for this project will be set to gather use-cases, identify necessary functionality, and ultimately understand all characteristics which the project must satisfy to fulfil the needs of the customer. These details will be used to create the Product Requirements Document (PRD), which must be approved by the key stakeholders before moving on to the Design Phase and will then be used as a key guide for the ultimate direction of the project.

Design Phase

During the Design Phase, the development team will use the requirements specified in the Product Requirements Document to design the key system architecture in the form of relational database diagram which show the relationships between data objects, as well as visual mockups of the User Interface (UI) design. A basic wireframe will be created to show how the elements of the site will flow to one another, and a low fidelity prototype will provide a visual representation of where the UI elements will be located in their final phase.

Implementation Phase

The Implementation Phase is where the application itself will be created, using the Product Requirements Document and the work of the Design Phase as guidance. Developers will work with key stakeholders and ultimately require their approval to ensure that the software meets the requirements that were earlier specified.

Testing Phase

During the Testing Phase, unit tests will be utilized to ensure that the required functionality has been reliably and accurately met. Both quality assurance members and end users may be used to verify that the features of the site work as designed and intended. Any issues that are found will be documented and sent back to the product developers for correction and re-testing.

Delivery Phase

Upon reaching the Delivery Phase, the product will be made live for full use and availability to the end users. This type of application will use a soft cutover, meaning that all appointments being created for the future will use the new website, while older existing appointments can be manually entered into the site at the convenience of the users.

Maintenance Phase

The Maintenance Phase of this project will ultimately depend upon the contract created between the customer and the developer. At the minimum, a developer will be made available for bugs that are caught after the go-live but missed during the Testing Phase. Beyond this specified maintenance phase, the contract may allow for the expansion of current features, or the addition of new features, at an agreed upon cost.

Deliverables

Per the SDLC Methodology, there are specific Project and Product Deliverables which must be produced during the course of this project. Below is a list of these deliverables, as well as the production phase during which they will be created.

Project Deliverables

These consist of items that are part of the Project Manager's realm of responsibilities.

- Project Requirement Document
    - This document will include a thorough list of requirements necessary for the customer to consider the project fully and successfully complete. The 'what' of the project must be fully defined, so as to specify the scope of the project and the customers requirements, but the 'how' of the project (such as technical details and specific methods to be used) is better left to the development and design teams.
    - Created during the Requirements Phase
- Project Schedule
    - The project schedule will breakdown the phases of the project into quantifiable tasks to be completed, along with estimated timelines for each task.
    - Created during the Requirements Phase, but this may be a dynamic document that is updated as the project progresses
- Wireframes
    - A low fidelity, rough representation of the application, created to show how different elements of the application will flow into one another.
    - Created during the Design Phase
- Mockups/Layout
    - As a higher fidelity representation of the application, the mockup is created to give an accurate look at how the User Interface and site layout will be displayed to the user.

While made to look like a functional webpage, a mockup has no code behind it to provide any functionality.
    - Created during the Design Phase
- Prototype
    - The prototype is the next iteration of wireframe and mockup. It will have the look and fidelity of the mockup but start to implement code behind it to provide some very limited functionality. The prototype will show how a user can navigate through the application, but likely will not contain the business logic behind it to actually submit data to the MySQL backend.
    - Created during the Design Phase
- Functional Software
    - After the Design Phase is complete, project developers will create the actual code that will make the product viable. All components of the software are implemented during this phase.
    - Created during the Implementation Phase
- Test Plans
    - A document created to ensure that all elements from the requirements document have been implemented correctly. The test plan will include both verification that the requirements have been met, as well as verification that the site functions correctly and accurately, searching for bugs or logical errors in the implementation.
    - While the Test Plan is created during the Requirements Phase, it will be utilized during the Testing Phase

Product Deliverables

Product Deliverables represents what is produced to deliver to the customer.

- A Graphical User Interface (GUI) that accurately represents the agreed upon requirements from the prototype
- Security access – a login page with username/password verification
- Site navigation functionality which meets the agreed upon flow from the design phase
- MySQL database backend created to run on the customer's local server
- Website hosting on the customer's local intranet
- Assistance with cutover to new product, including importing data from users' calendars
- Completed project which meets all requirements laid out in the contract with the customer

Implementation

The implementation of this project will be straightforward. Working with the customer's local IT department, a MySQL database will be installed on the local server of their choice. Provided scripts will be run to create the required tables, as well as customer accounts for user login. The code for the new website will also be hosted on a local server, run by the customer's IT department. As this is a new application, there will be no downtime during the go-live for this site.

Once local installation is complete, validation and verification can take place. Testing will have been completed by the developer prior to this point, but this will provide an opportunity for the customer to directly test the application as well. Both a member of the customer's IT department and an actual end user should be utilized for verification. The IT department tester will be able to verify that the site functions and flows correctly within their intranet, while the end user tester can be best used to confirm that the site behaves as intended under normal use.

Due to the small number of end users, training can be accomplished via a single meeting. Existing appointment data can be manually imported, either by a customer-user after training, or by a developer on-site for the cutover support.

Validation and Verification

Validation and Verification will take place in three major phases.

1) During the implementation phase, coders will utilize their own unit tests to ensure that their work provides the desired results. This will take place using standard debugging features in Visual Studio, as well as by using MySQL queries to verify that submitted data is being created, updated, and deleted correctly on the MySQL database backend.
2) During the testing phase, quality assurance members will thoroughly test the application against the requirements specified in the project requirements document. They will follow up on the coders' unit tests, as well as test input validation to search for edge cases which may cause the application to fail.
3) During the delivery phase, the customer will provide their own acceptance testing to ensure that the product meets the requirements they specified at the beginning of the process. The application must pass the customer's acceptance testing before it is considered to be a success, and before a full go-live can take place.

Environments and Costs

Programming Environment

The project has been created as an ASP.net web application, which can be hosted on any Windows PC running Windows 7 or later, or Windows Server 2012 R2 or later. While it is possible to host this application on a Linux Apache server using a reverse proxy, it will require additional configuration and is not recommended. For the backend, MySQL 8.0.26 is the minimum requirement, as this application was designed for this version, and anything older than 8.0.26 can have significant compatibility issues.

Environment Costs

The initial costs for this application are virtually nil, as every element required is either available via a free open-source license or hosted on a system that very likely already exists. This application can run on any Windows PC using Windows 7 or later. If the customer is in a macOS-only environment, the oldest and least expensive Windows license available is Windows 10, with a current cost of $139 for a license. MySQL 8.0.26 is available for a free download and uses a free, open-source license. As the website is hosted internally on the customer's intranet, there are no hosting or licensing fees associated with it, and the low data overhead of such a simple application should not cause the customer to need any increase in bandwidth.

It is reasonable to expect that the IT department of the customer's company will be able to maintain the MySQL installation and Windows/Windows Server hosting solution as a part of their normal duties, with any increased pay to them being absorbed by the customer as a cost of doing business. If the customer wishes to upgrade this application in the future, a service contract can be negotiated to expand the database and website features.

Human Resource Requirements

The team for this project will consist of a project manager, designer, developer, and quality assurance member. The project manager will be most active during the requirements phase, but will also provide oversight and communication during the design phase. It is estimated that they will work approximately 60 hours, at a rate of $45 per hour, for a total of $2,700. The designer will sit in on some of the requirements meetings, but mostly work in the design phase. The designer's rate is $50 per hour, at an estimated 20 hours of work, for a total of $1,000. The developer estimates that approximately 80 hours of work will be required, almost entirely during the implementation phase, at a rate of $70 per hour for a total of $5,600. Lastly, 20 hours have been allocated for our quality assurance member, at a rate of $40 per hour and a total of $800.

Role	**Rate**	**Time**	**Total**
Project Manager	$45/hr	60 hours	$2,700
Designer	$50/hr	20 hours	$1,000
Developer	$70/hr	80 hours	$5,600
Quality Assurance	$40/hr	20 hours	$800
Grand Total			**$10,100**

Project Timeline

Phase	Milestone/Task	Deliverable	Description	Dates
Requirements	Task 1/Discovery	Requirements document and projected schedule	Zoom/Webex meetings to specify customer's requirements	5/2/2022 – 5/5/2022
Design	Task 2 / UML Diagram	UML Model of MySQL database	Model to show the relationship between entities in multiple tables of the database	5/6/2022 – 5/9/2022
Design	Task 2 / Wireframe and Prototype	Low-Fidelity Wireframe and High-Fidelity Prototype	Wireframe will demonstrate the flow between different elements, and prototype will simulate the final	5/6/2022 – 5/9/2022

			appearance of the application user interface	
Design	Task 4 / Testing Plan	Testing Plan	Project manager, in addition to developer, will create a plan for testing the application and specify what tests user will require before accepting the product	5/10/2022
Implementation	Task 5 / Application	Creation of version 1 of the application	Developer will build the application in accordance with the customer requirements and design documentation	5/10/2022 – 5/23/2022
Testing	Task 6 / Functional Test	Completion of all functional testing	Quality Assurance thoroughly tests application in accordance with the testing plan	5/23/2022 – 5/25/00
Testing	Task 7 / Acceptance Test	Completion of acceptance tests and signoff by customer	Representatives of the customer perform required testing to verify that the product meets all requirements	5/26/2022 – 5/27/2022
Deployment	Task 8 / Application Deployment	Deployment of application to customer's production environment	MySQL server hosted and populated on customer's server. Web application hosted on customer's server.	5/30/2022 – 5/31/2022
Maintenance	Task 9 / Maintenance Plan	Maintenance Contract	Creation of service contract, defining service level agreements for ongoing support.	5/31/2022