

C868-Software Project Capstone Summary

Task 2- Section A



Capstone Proposal Project Name: Matthews Orthodontics Scheduler Application

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Business Problem

The Customer

Matthews Orthodontics is a new dental specialist office that has the newest technology in the field of Orthodontics and experienced professionals. They have a high number of customers but only one person in charge of scheduling appointments for them. Matthews Orthodontics wants to offer an environment where customers feel appreciated and respected and where they can receive the best professional care for their teeth.

Business Case

Matthews Orthodontics is looking for a way to improve their current scheduling system which is based on using an Excel spreadsheet that is saved on the receptionist's desktop computer in the front office. While this allows the customer appointment information to be kept neatly on the computer it can be inconvenient for multiple reasons. One reason is that any appointment conflicts will not be tracked. Customer information also has to be entered manually every time they schedule an appointment which is time consuming and can lead to inconsistencies with the data. This new application that will be created will check any type of schedule conflict and also uses a customer database that can be pulled upon when creating appointments.

Fulfillment

The application that is being developed for Matthew Orthodontics will be a stand-alone application that can be run on a Windows computer. It will start with a login page for users to enter their username and password. The opening page after the login will be an Appointment overview where users can glimpse all the important information such as the dates of the appointments and the customer names associated with them. The application will allow you to add or update or delete customer information and the appointments. It will also feature a page where users can view meaningful reports about the relationship between customers and the appointments. This application also has a database that it uses to keep the data

consistent and updated between different users that have it downloaded to their computer.

Existing Gaps

Matthews Orthodontics currently uses an Excel spreadsheet to manually track appointments for customers. They have separate sheets for customer details and appointment information. This system of data entry sometimes however can lead to errors and inconsistencies such as appointment overlaps or misspelling of customers' names or other personal information. With this current system using Excel users also have to manually enter customer information every time they schedule an appointment. With this new proposed system the user will only have to enter customer information once which will then be kept in a database that can be referenced later for future appointments.

SDLC Methodology

The Waterfall Software Development Methodology will be implemented during the development of this application. This is because the requirements of what the client needs for the organization of their appointments are pretty straightforward. These will be outlined before the development process begins.

Below are the five steps of the Waterfall method and how they will be implemented:

1. Requirements: the first stage of this process, before any coding or drafting of the layout, is clearly understanding and defining what the client needs in this application to be successful. These requirements must be clearly laid out by the customer. During this step a schedule will be created that shows the timelines of when the different stages of the project will be completed.
2. Design: the next stage will involve creating a screen blueprint that will provide a visual guide of what the application user interface will look like when it is finished. An ERD that outlines the structure of the database will be created at this stage as well. This will be displayed in Part C of this document.
3. Implementation: at the end of this stage the application will be built out by the developer. The developer will write code that builds a fully functional

application that fulfills the requirements laid out in the first stage of this process.

4. Verification: during this stage the developer will perform various tests to ensure that the application is successful. If during these unit tests any bugs are discovered, the developer will document them and work to correct them before performing any more tests. Once the developer has tested sufficiently and does not encounter any more bugs with the application, the user will then test it to make sure it meets the requirements from their end.
5. Maintenance: during this stage of the development process, the developer will closely monitor the user's implementation of the application. If the user reports any more bugs with it the developer should address them.

Deliverables

These deliverables relate to the Waterfall methodology chosen for the development of this project:

Project Deliverables:

These items are in the realm of the responsibilities of the Project Manager.

- Project Schedule: this outlines the timeline of what is being worked on and when it will be completed.
- Test Plan: these are the steps for testing that the customer will implement to test the product to make sure it functions.
- Requirements Traceability Matrix (RTM): this document outlines the customer requirements and the test results and is used to show that the requirements have been met (eg: that there is no overlap when new appointments are being created, that customer information is properly maintained in a database, etc.)

Product Deliverables:

These deliverables are what is delivered to the customer as a product:

- Wireframes: this blueprint is a representation of the application that is a general idea of what it will look like when it is finished. This is low-fidelity and does not usually contain any styling or color.
- Mockups/Layouts: these are better representations of what the application will look like once it is completed but it does not have any functionality. This deliverable can be reviewed by the customer to see if the layout fulfills their needs.
- ERD: this is a representation of the relationship between various elements in the database the application will be using.
- Prototype: a fully functional Java application that schedules appointments for customers.

Implementation

The first phase of the implementation involves gathering and qualifying the requirements from the managers at Matthews Orthodontics. This consists of an hour-long session to review the goals and objectives of this application and how it will fulfil the current needs of the company. A second session will follow after this one. During this session the findings of the previous session will be reviewed and the list of requirements will be finalized and approved by the board of directors.

The design phase will begin once the requirements have been established. An ERD (entity relationship diagram) will be created by the developers to demonstrate how the various components of the database are related to each other. UI design mockups will also be created. The customer will need to approve the ERD and the design mockups before the next phase begins.

The next phase is implementation. The ERD and the mockup from the previous phase will guide the developers to create the application. The next phase according to the waterfall method is the verification phase where the application will undergo multiple tests. This ensures that the product is fully operational. This stage should address any bugs of the application.

The product will then be delivered to the customer along with a user manual that shows how to use the application step by step. The Project Manager and the Developer will be heavily involved during this stage to ensure that the application is installed in all the desktop computers in the office. They will closely monitor the use of the application by the users by checking in with them daily and any bugs found during this time by the users will be reported to the Project Manager who will then report them to the developer to be addressed. This application will be used concurrently with the current Excel spreadsheet application system in order to ensure that data is not lost due to any unforeseen bugs that may have arisen from the application.

Validation and Verification

This section explains how the application will be verified and validated. It will consist of a complete and thorough test of the functionality and design of the application. First it will be tested by the software engineer multiple times throughout the various stages of the development of the application to ensure that there are no errors. The developer will then run a test at its completion as a user to ensure functionality.

Then it will be tested by the end user, especially the ones who will be using it the most (in this case the receptionist). She will test its functionality by adding test customers and test appointments in the system and validating that certain requirements and functionalities are working as expected (like the avoidance of creating an appointment that overlaps with other appointments). This stage is important because it gives multiple opportunities to check for possible errors or failures in the application that may have been overlooked.

Environment and Costs

Programming Environment:

The application has been developed in Java and it will be compatible with any Windows 10 operating system that has Java Runtime Environment Version 8 or higher. A MySQL database via a JDBC library will be used by the application.

Environment Costs:

A shared environment will be used for this system that is being developed. In a shared environment, the costs are shared among multiple organizations. The database will be maintained in Amazon Web Services or AWS. This will require a nominal fee to maintain. This cloud service provides a 99.8% uptime and unlimited storage. There will be an annual fee of \$50 per device that is attached to the network. This will cover any necessary upgrades that are needed for the operating systems or the network. The environmental costs overall are minimal.

Human Resource Requirements:

In this project team there will be a developer, a designer, a quality assurance specialist and a project manager. The designer will work during the design phase and will be working at about \$60 per hour and about 32 hours of labor. The Project Manager will be working during each phase except for during the implementation phase. She will be working at about \$50 per hour and will be working around 70 hours. During the implementation phase the developer will be operating. This will require around 100 hours of work and the rate is going to be \$75 per hour. And finally, the quality assurance operator will be working at \$50 per hour and for 40 hours. The total of the cost for the labor for these four workers will total to \$14920. The table below outlines the rate, time and total for each role:

Role	Quality Assurance	Designer	Developer	Project Manager	Total
Rate	\$50 per hour	\$60 per hour	\$75 per hour	\$50 per hour	
Time	40 hours of labor	32 hours of labor	100 hours of labor	70 hours of labor	
Total	\$2000	\$1920	\$7500	\$3500	\$14920

Project Timeline

Phase	Milestone/Task	Description	Deliverable	Dates
Requirements	Task 1	Meet with the customer and discover/review the requirements	Requirements	8/1/2021-8/7/2021
Requirements	Task 2	The layout of the database is reviewed and verified	ERD	8/11/2021-8/14/2021
Requirements	Task 3	A plan for testing is created by the developers and approved by the managers	Plan for Testing	8/11/2021-8/13/2021
Design	Task 4	During this time a UI will be developed that demonstrates the look and the feel of the project.	Wireframe (Low fidelity) Mockup (High fidelity)	8/14/2021-8/15/2021
Implementation	Task 5	The application will be created based on the requirements and the design documents	Java Application	8/18/2021-8/29/2021
Testing	Task 6	Testing of the application will be conducted during this time	Results of the Test	9/1/2021-9/5/2021
Verification	Task 7	Unit tests will be conducted. Then it will be delivered to the customer for their use and they will conduct acceptance testing	Java Application	9/8/2021-9/10/2021
Deployment	Task 8	The project will be deployed during this time	Java Application	9/15/2021-9/16/2021
Maintenance	Maintenance Plan	The client will be provided with ongoing maintenance	Maintenance	9/27/2021