C868 – Software Capstone Project Summary

Task 2 – Section A

Capstone Proposal Project Name: Appointment Scheduler for On-Track Recovery

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Business Problem

The Customer

On-Track Recovery is an out-patient substance abuse rehabilitation center that has been helping people overcome their addictions for the past 15 years. In that time On-Track Recovery has grown to have 3 facilities across San Antonio, Texas. Each facility has 6 counselors that guide clients through their 12-week program. Currently, the counselors at each location also handle all administrative functions. Each facility has enjoyed the freedom of determining how to handle these administrative functions themselves.

On Track Recovery has plans for 3 more facilities around the San Antonio area with long term goals for expanding into Austin, Texas. Along with the goal of expanding the company, the owner wishes to transition existing facilities to using the same application for scheduling appointments to provide a more reliable, consistent, and easier to track experience for all parties.

Business Case

Prior to the decision to move to a universal scheduling application each facility was able to decide on its own how it wanted to keep track of appointments. One facility was using an Excel spreadsheet, another was using an open-source application that only stored data locally, and the last facility was using a calendar made using a whiteboard and color-coded electrical tape in their meeting room.

The Appointment Scheduler application will provide a consistent scheduling experience across all 3 existing On-Track Recovery locations. The application utilizes a database stored in the cloud that will allow employees to access the application from the office or while away. Employees can also view each other's schedules just as they are able to with their current scheduling methods.

Fulfillment

The application will be programmed using the Java programming language. Java programs run in a virtual environment known as the JVM (Java Virtual Machine). This allows Java programs to run on any computer despite what operating system is being used (Windows 10, MacOS, Linux, etc.), so no upgrades to company computers will be needed. The only requirement is to install the Java Runtime Environment on each computer.

Appointment Scheduler will be able to save all customers and appointments to a database that is stored in the cloud. This will empower all counselors with the ability to easily create new customers and update existing customer information with the same functionalities being available for appointments. If a counselor is working from a different facility or away from the office, they will still be able to review their customers and appointments.

The database uses the SQL language for handling all database queries and storing information. After the initial setup of the database no maintenance will be needed with the database directly, but it will still be capable of expansion should any changes be required in the future due to company growth or new company goals. Appointment Scheduler will handle all communication to and from the server, protecting all data from unintended tampering.

Existing Gaps

Due to each location having their own methods for tracking appointments there are frequent scheduling conflicts when counselors need to work at another facility or away from the office. There has never existed a way to see another counselor's schedule from another location and required email and phone exchanges for coordinating appointments. This often led to frustrations and miscommunication of appointment times. In the case of one location, appointments could sometimes be erased by accident before they were completed. The other two locations do utilize software for tracking their appointments. However, in these cases the data is only stored locally and is not shared with any other location.

SDLC Methodology

For this project the SDLC methodology will be the Waterfall method. This method is believed to be the best fit for the project due to the short time span required to build the application. The appointment scheduling application is also a very commonly requested program. Therefore, an entirely 'new' plan will not need to be drafted, a past plan may be used as a base in which we can add the specific requirements needed for On-Track Recovery. With the Waterfall method each phase must be approved/accepted as complete before the next phase may begin. The following is an outline for each phase of the Waterfall method:

Requirements:

A meeting will be held with On-Track Recovery to discuss and define the specific functionalities required for meeting business needs. This sets the scope for the project and is the time for all parties to understand what is expected as the deliverable product. The requirements will be documented in a software requirement specification (SRS) document. Multiple meetings may be held if needed. Estimated time: 1 day.

Analysis:

Review of the SRS and creating the project schedule happen during this phase. In future phases, the SRS will be used to resolve any disputes that may arise. It is important that both the development team and On-Track Recovery agree with what is included in the SRS before moving into the design phase. Estimated time: 1 day.

Design:

Using the SRS document, a functional design will take shape. The user interface (UI) will be planned using wireframes. These wireframes will be turned into a prototype to present to On-Track Recovery. This prototype will have the ability to navigate through each screen of the application to get a feel for the application. It will not have the ability to create new customers and appointments or communicate with a database. Once a prototype has earned approval the next phase may begin. Estimated time: 3 days.

Coding:

The approved prototype will be turned into source code. This is where the application transitions from idea to reality. The UI will be coded to look exactly like the approved prototype. The

database will be created and formatted. The functions covered in the SRS will be programmed to the UI. Developers will perform unit testing as each unit reaches completion. Estimated time: 8 days.

Testing:

Once every unit of the application has been completed the application will be tested rigorously to ensure quality standards. The first group of tests will be performed by the development team, otherwise known as alpha testing. Beta testing will then take place with the On-Track Recovery counselors. During these two phases of testing both groups will document any bugs or issues they experience. Then the program will debugged and issues covered within the SRS will be resolved. The third test is known as the acceptance test. On-Track Recovery will again use the program to test its functionality, granting approval upon satisfaction that the application meets the requirements defined in the SRS. Estimated time: 5 days.

Deployment:

The application may now be installed onto all On-Track Recovery computers. The application will not require a specific operating system but the computers must have the most recent Java Runtime Environment (JRE) installed. Appointment Scheduler is now ready to fill the business needs of On-Track Recovery. Estimated time: 2 days.

Maintenance:

Occasionally after deployment, unforeseen issues or bugs may arise. Any issues found will be dealt with at this time to ensure On-Track Recovery will have a smooth experience going forward. Estimated time: 2 days.

Deliverables

The following section will outline and explain the deliverables for each phase of the development cycle. The deliverables have been split into two categories: Project Deliverables and Product Deliverables.

Project Deliverables

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

- Project Schedule
  - A general timeline has been laid out in the SDLC Methodology section. This document will break down each phase into more detailed timelines. Due: End of analysis phase.
- Software Requirements Specification
  - This document covers the applications required functionality in detail. It will be used throughout the project as the main source of guidance. The SRS will define the project's scope and will be used to settle any disputes thereof. Due: End of analysis phase.
- Wireframes
  - A low fidelity representation of the applications UI and functionality. The wireframe will not have any functionality of its own. Due: During the design phase prior to prototyping.

- Prototypes
    - Created using the wireframes as guidance. The prototype will have navigational functionality but no logical functionality. This allows for getting a feel for the final version of the application with the ability to rapidly change features if anything feels off with the UI. Any data represented in the prototype is strictly placeholder material. The ability to delete or change data will not be present. Due: During the design phase after wireframe approval.
- UML Class Diagrams and Entity Relationship Diagram (ERD)
    - Class diagrams show what each class contains as far as variables and functions, as well as showing how each class interacts with one another. The ERD shows what information each table in the database will contain and how they are related to each other. Due: End of design phase.
- Testing Plan
    - Testing will be performed by the development team and On-Track Recovery. The testing plan will provide tasks with specific instructions for completion. Due: Testing phase.

Product Deliverables

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

- Due during deployment phase:
    - Intuitive graphical user interface
    - Secure login
    - Application that can create, update, and delete customers
    - Application that can create, update, and delete appointments
    - Ability to filter appointments by week, month, or all, and by counselors
    - Ability to search through customers and appointments via user-entered text
    - Scalable cloud database
    - User Guide for application operation
- Due during maintenance phase:
    - Maintenance Guide

Implementation

The Appointment Scheduler application does not require a specific operating system to function. However, it does require the installation of the Java Runtime Environment (JRE). Our staff will assist in the installation of the JRE prior to installing Appointment Scheduler. The installation for all three On-Track Recovery locations shall be completed in one business day. An additional day is listed in the project schedule to allow for the training of staff. Training should only take an hour or two at each location.

Validation and Verification

The development team will perform the first round of testing. White box testing will be performed to ensure each function of the program delivers the expected results. Any functions that are found to produce unintended results or bugs will be corrected. Then the second round of testing will take place

with a portion of On-Track Recovery's counselors. They will be provided with specific tasks with strict instructions to test the applications functionality. Any bugs or issues documented will be corrected before the final round of testing. The final test, also known as the Acceptance Test, will be completed by the On-Track Recovery owner and any staff they wish to participate. No bugs or errors should be expected during this test. All testers will use the application freely to determine if it meets business needs, and that all requirements that were included in the SRS are fulfilled. Once the application has been accepted as meeting all requirements, it will be prepared for production.

Environments and Costs

Programming Environment

The application will be programmed using the Java object-oriented programming language. Java is compatible with any operating system so long as the computer has Java Runtime Environment version 8 or newer installed. No other upgrades or installs will be necessary to run the application. The application will store data on a MySQL database hosted by On-Track Recovery's main office server.

Environment Costs

Java Runtime Environment 8 or newer: Free

HPE ProLiant ML350 server for main office: $4,400

Microsoft SQL Server 2019 Standard: $700

Human Resource Requirements

The project team will have one project manager, one software designer, three software developers, and one quality assurance specialist. The project manager and developers will be spending the most time on this project. Our quality assurance specialist handles some aspects of the testing phase and will handle training of On-Track Recovery staff. The designer will be active during the design phase of the project only. Time and cost breakdowns are the following:

1 Project Manager - $60 per hour – 40 hours - $2,400

1 Software Designer - $70 per hour – 24 hours - $1,680

3 Software Developers - $40 per hour (individual)/ $120 per hour (group)- 104 hours - $12,480

1 Quality Assurance - $30 per hour – 32 hours - $960

Grand Total: $17,520

Project Timeline

Phase	Milestone/Task	Deliverable	Description	Dates
Requirements	Task 1 / Requirements defined	Software Requirements Specifications document	Meeting with customer to determine software needs	11/29/21
Analysis	Task 2 / Schedule finalized	Project Schedule	Present the finalized schedule to customer. Obtain sign off to begin design phase.	11/30/21
Design	Task 3 / Wireframe	Low Fidelity Wireframe	Wireframes finished and approved.	12/1/21
Design	Task 4 / Prototype	High Fidelity Prototype	Prototype presented to customer and approved.	12/1/21-12/2/21
Design	Task 5 / Diagrams completed.	UML Class diagrams and ERD database diagram.	The diagrams will be provided to the customer so they will have an idea of how everything connects in the application.	12/2/21-12/3/21
Coding	Task 6 / All units of application coded	Application	Developers will program the application following the SRS document, and UML and ERD diagrams.	12/6/21-12/15/21
Testing	Task 7 / Alpha Testing	Testing Plan part 1	Part 1 of the Testing Plan will be completed by the developer team with results presented to the customer.	12/16/21-12/17/21
Testing	Task 8 / Beta Testing	Testing Plan part 2	Part 2 of the Testing Plan will be completed by the On-Track Recovery staff. All issues will be corrected following testing.	12/20/21-12/21/21
Testing	Task 9 / Acceptance Test	Acceptance Sign Off	The owner of On-Track Recovery will review the application compared to the SRS document.	12/22/21

Deployment	Task 10 / Install application	Ready-to-use application & User Guide	Setup the server at the On-Track Recovery main office. Install JRE on all devices receiving the application. Finally, install the application and train staff.	12/28/21-12/29/21
Maintenance	Task 11 / Maintenance Plan	Maintenance Guide	Discuss maintenance of application systems and deliver maintenance guide.	12/30/21-12/31/21