**C868 – Software Capstone Project Summary**

**Task 2 – Section A**



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# **Business Problem**

**The Customer**

Home & Hearth Realty is a country-wide realty company that assists new and returning clients with purchasing a new property or selling owned property. Home & Hearth Realty has offices across the country in major cities in Washington, Colorado, Texas, and Florida. They are a rapidly growing company that plans to expand to 4 more states and double their existing workforce in the next decade.

H&H Realty is committed to making the process of buying or selling property easy and to establishing meaningful and lasting relationships with its clients. They pride themselves on exemplary client satisfaction and assisting every client in finding their perfect match.

## **Business Case**

Home & Hearth Realty has several offices across the country where they meet with clients and assist them in buying and selling property. Currently, each realtor is individually tracking their scheduled appointments and reporting their schedule to the office administration at the end of every week. From there, it is the responsibility of the office administration to document and compile all realtor schedules and send them to H&H Realty’s main office. Each office also has its own customer records database, so there are occasional duplication errors since there is no way to synchronize the database across all offices.

The proposed application will streamline the scheduling process and improve the current process by making all data easily accessible by all employees. Each realtor will be able to log into the application to make changes to their schedule, view their schedule, and access the customer records database to add or update records. There will be security measures in place to ensure only verified users can access the system and make changes. H&H Realty has also requested that there be an administrator account created for each office that is able to delete customer records. All other users will not be able to delete customer records and will have to submit a ticket to the administrator if they need a record deleted.

Since H&H Realty has offices across the country, the application will automatically adjust appointment times to the time zone of the user. There will also be alerts that are triggered when a user logs in that will remind them if they have an upcoming appointment. Lastly, the application will provide reports that contain information essential to business functions.

## **Fulfillment**

The proposed application will be a stand-alone Windows Forms application that connects to an existing cloud-based MySQL database. The primary users will be realtors, who will be given unique login information that they will use to access the application. The users can add, update, or delete appointments and changes will be displayed in their schedule on the main dashboard. Users can view their schedules by either the current week or the current month. Users will also be able to view, add, or update customer records. If the user is the administrator, then they will also be able to delete customer records.

All data added, modified, or deleted through the application will be saved in the company’s MySQL database. There will be data input validation to ensure all data is properly formatted before being pushed to the database, and any incorrect inputs will generate error pop-ups so that the users are aware of what the proper format is.

There is also a reports page that will generate reports based on H&H Realty’s requests. These reports will provide essential data that will assist H&H Realty in better managing each office and measuring key business metrics.

# **Existing Gaps**

The existing process has each realtor individually tracking their scheduled appointments and then submitting a detailed Excel spreadsheet with weekly appointment information to their office administrators. The office administrators then compile these, document them so that they can keep track of commissions and performance metrics, and send them to Home & Hearth Realty’s main office to be archived. This process makes it difficult to know which realtors are available and when. This highly impacts customer satisfaction when trying to find available realtors. This process is also prone to human error and puts a high workload on the office administrative staff.

H&H Realty has a few offices that share the same metropolitan area, and because each office tracks its own customers there are occasional record duplications. It is up to the database administrator of each office to make changes to the customer records database, so adding/modifying/deleting data requires a ticket to be submitted which slows down business operations. Allowing employees to make their own changes to the database and instantly committing these changes will help streamline the process and improve business functions and customer satisfaction.

# **SDLC Methodology**

The Software Development Lifecycle methodology that will be used for this project is the Waterfall Method. This methodology will be used due to the small scale of the program and clearly defined requirements. Home & Hearth Realty has also requested that a strict timeline be followed since the company is planning to start internal expansions after the completion of this project and wants newly hired employees to be trained on the new system.

Requirements Phase

The first phase of the Waterfall method is the requirements phase. This phase consists of gathering and documenting the requirements of the project. There will be several meetings conducted to ensure that all expectations are clearly defined before producing the project requirements document. This document will then need to be approved by all stakeholders before moving to the next phase.

Design Phase

Once the requirements have been defined and approved, the design phase can begin. The team will start by reviewing the requirements document and work on mockups and diagrams that will help the program start to take shape by defining the software architecture. The deliverables of this phase will be a wireframe, entity-relationship diagram, and a prototype.

Implementation Phase

Next is the implementation phase which uses the deliverables of the previous two phases as a guide to the development of the program. In this phase designers and developers will create the program. This will be done by developing units that will be tested after completion to ensure code functionality and that the outlined requirements are being met.

Testing Phase

After the completion of all units of the program comes the crucial testing phase. All of the units developed in the implementation phase will be integrated into a system once they successfully pass testing. Once the system is complete, then the entire system will be tested for any possible faults and/or failures before moving on to deployment.

Deployment & Maintenance Phase

Finally, we have the deployment and maintenance phase. In the first part of this phase, the application will be deployed in a canary deployment to ensure that any possible issues can be patched before full-scale deployment. Once the new system has been entirely and successfully deployed, then the last step is maintenance. The client will provide feedback and bug reports that will be addressed through patches and bug fixes. The length of this stage is determined by the client contract.

# **Deliverables**

The Waterfall method has specific deliverables that are produced during each phase of development. These deliverables are broken down 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 Requirement Document
  + Contains all requirements gathered in the requirements phase that have been agreed upon by the stakeholders.
* Project Schedule
  + An estimated timeframe for each phase of the project as well as dates for important milestones.
* Wireframe
  + A low-fidelity representation of the application’s graphical user interface that shows the workflow.
* Entity-Relationship Diagram
  + Shows how the database will be designed as well as how each entity in the database is related.
* Prototype
  + This will be used to demonstrate what the expected final application will be like. It will be used to drive development and will be shown to the client for final approval before development begins.
* Testing Plan
  + A detailed list of testing procedures that will be used by the Quality Assurance team to ensure the application functions as anticipated.

## **Product Deliverables**

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

* Complete desktop application that meets all specified requirements
* Security and admin access to the application to ensure data is secure and only accessible by approved users.
* Custom cloud-based database

# **Implementation**

The implementation of the application will be coordinated by the Project Manager. The application will first be deployed to a small group of selected users to conduct usability tests and to check for any issues that arise from installation. The group will also provide feedback that will be used during the full deployment so that the entire process is as seamless as possible.

Since H&H Realty already uses Windows 10 on their existing machines, no changes to the environment will need to take place. The installation will be carried out by our team and will be shown to the administrative staff as well as documented in a user guide for future reference. The team will also train new users on how to carry out essential tasks within the application and document all application features in the user guide.

# **Validation and Verification**

The Quality Assurance team will perform functional tests on the application to verify that all requirements outlined in the requirements documentation are being met. They will also test for input validation since the application will be modifying an existing database.

After the functional tests are completed and all necessary changes have been made, then the application will be deployed to a small group of selected users in a canary-style development for usability testing. These users will provide feedback and bug reports to the QA team for anything that may have been overlooked and to ensure that the application meets or exceeds client expectations. Once this step has been completed then the application can be deployed to the rest of the company machines.

# **Environments and Costs**

## **Programming Environment**

The application has been developed using Microsoft’s Windows Forms framework. It is recommended to run the application using a machine running Microsoft Windows 10 for optimal performance. The application is connected to a cloud-based MySQL database that requires no configuration. Below are the specific requirements to run the application:

* Microsoft Windows 10 Operating System
* MySQL database version 5 or higher
* Microsoft .NET Framework version 4.7.2 or higher

## **Environment Costs**

Since the application is stand-alone, the majority of the costs are associated with purchasing Microsoft Windows 10 licenses for new machines that will be running the application. Currently Home & Hearth Realty is running Windows 10 Pro on their current machines, but due to anticipated rapid expansion, they will be utilizing Windows 10 Enterprise. Windows 10 Pro is a one-time fee of $199.99 whereas Windows 10 Enterprise is a subscription that starts at $7.00 per user per month. Enterprise also offers additional security features which will be highly beneficial to H&H Realty.

The current database supplied by H&H Realty is small enough that they are able to utilize a free cloud-based MySQL hosting service. The client is not interested in moving or changing their database during this project.

## **Human Resource Requirements**

The software development team will be involved in every phase of the project, so they are estimated to use 85% of the project budget and hours. The remaining budget will be allotted to administrative and environmental costs. The team anticipates that the project will take two months to complete, but additional time has been accounted for if necessary.

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# **Project Timeline**

Below is the proposed project timeline, all dates are approximate and are subject to change depending on project needs.

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| --- | --- | --- | --- | --- |
| Phase | Milestone/Task | Deliverable | Description | Dates |
| Requirements | Task 1 / Requirements Gathering | Requirements Document & Schedule | Meetings with client and stakeholders to discuss and agree on requirements | 01/01/2022 – 01/07/2022 |
| Design | Task 2 / Wireframe & UML Class Diagram | Low-fidelity wireframe,  High-fidelity mockup, & UML Class Diagram | Design the application’s UI and database/class entities as well as their relationships. | 01/08/2022 – 01/14/2022 |
| Design | Task 3 / Prototype | Functional Prototype | Creation of a prototype that will ensure requirements are being met before development starts. | 01/15/2022 – 01/21/2022 |
| Implementation | Task 4 / Application | Win Forms Application | Development of the application by the development team. | 01/22/22 – 01/31/2022 |
| Testing | Task 5 / Functional Test | Test Results | The Quality Assurance team will perform unit tests and verify that all requirements are being met. All test results and found bugs will be documented fully. | 02/01/2022 – 02/07/2022 |
| Deployment | Task 6 / Canary Deployment & Feedback | Usability Results & Bug Reports | The application will be deployed to a small group first for testing/feedback. Any discovered issues will be corrected before full deployment. | 02/08/2022 – 02/14/2022 |
| Deployment | Task 7 / Full Deployment | Fully deployed application & tickets for errors/bugs if applicable | Full deployment of the application to all users, training new users on the new system, and collection of user feedback and tickets. | 02/15/2022 – 02/28/2022 |
| Maintenance | Task 8 / Patches & Bug Fixes | Maintenance Contract & Application Patches | Ongoing application support for the first six months after deployment per client contract. At the end of the 6 months, the client can opt in to sign up for a longer maintenance window. | 03/01/2022 – 08/31/2022 |