

C868 – Software Capstone Project Summary

Task 2 – Section A



Capstone Proposal Project Name: Customer and Rental Management System

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Business Problem

The Customer

The customer is an engineering firm, Hycean Firma, which produces specialized equipment and rents the equipment to customers. Their products are used in construction, geological surveys, waste disposal and various other industries. Their mission is to provide affordable access to highly customized engineering products by allowing customers to rent these products rather than having to purchase them.

Business Case

Hycean Firma's customer base has grown by 300% in the past year and keeping track of customers, appointments and rentals has become cumbersome. They currently use a spreadsheet for storing customer information, a whiteboard for appointments and a handwritten system for tracking rentals, consisting of paper receipts. The Customer and Rental Management system will provide a centralized location for managing customers, appointments, and product rentals. It will provide a database of all business areas, be easy to use and easy to update. Additionally, it will allow Hycean Firma to create reports of different business areas allowing them to extrapolate useful data for business use.

Fulfillment

A desktop application will allow Hycean Firma to securely store, create and manage customer information, appointments, products, and rental information. All of these areas will be stored in one centralized SQL database which the application interacts with. The main application will require a secure login utilizing a username and password combination in order to access.

Once logged in, the main screen provides an instant overview of all customer information and customer appointments. Customers can be searched for by name or filtered by VIP status. Appointments can be filtered per customer, show all of the logged-in user's appointments, as well as be filtered by time period. Customers and appointments can be edited, created, or deleted from this page. The user must be an administrator in order to delete customers or appointments. Customers can be upgraded to VIP status via an administrator account as well. VIP status allows a customer to have more than 3 rentals at a time. This allows Hycean Firma to better control inventory and therefore ensure higher quality service to customers who bring in large amounts of business. The products form can be accessed from the main screen allowing users to add, edit or remove products as needed. The rentals area can also be accessed from the main screen, providing an instant overview of all customers' current rentals as well as rental management via adding rentals and processing returns. Finally, reports are also available via the main screen and provide user schedules, the number of customer appointments by month, a list of all current rentals and a list of all VIP customers including their contact information.

Existing Gaps

Hycean Firma currently uses a spreadsheet for storing all customers and their information, a whiteboard for tracking appointments, and paper receipts and a logbook for tracking rentals. None of these processes are shared, exist online, or are easily sorted, searched, or updated. The desktop application replaces all three processes in various ways. First, the SQL database provides a centralized, shareable location to store all customer, product, rental, and appointment information. The database can be accessed on any computer with the application installed. Since the application is receiving and performing updates via the database, the addition, removal, and editing of customers, products, rentals,

and appointments will be updated instantaneously throughout the business. The management of all areas can be done within the application, eliminating the need to have to reshare the spreadsheet anytime an update is made to a customer, or scan a whiteboard for an appointment, or search through filing cabinets and stacks of papers in order to find a rental. All records exist electronically and can therefore be easily updated, searched, and shared.

SDLC Methodology

The SDLC Methodology used in this project is the Iterative Model. The customer has clearly defined and understood requirements of which existing processes it wants to replace with the application at this moment but is fully expecting to find other areas and features to be added in the future. The Iterative Model will allow quick turnaround of a viable product with the known, wanted features and allow for additions and updates to be easily added to the base program in future versions. The Iterative methodology will include five phases in total. First, the planning and requirements phase will be used to map out specifications and establish all requirements for the project. Second, the analysis and design phase will be used to create database models, appropriate business logic, and establish technical requirements. Third, the implementation phase will be where all of the planning and specifications will be coded into the actual application. Fourth, testing will be performed to ensure that all systems are functioning appropriately, and any bugs can be remedied. Finally, the deployment and evaluation phase will be used to launch the product for end-users and allow the development team as well as the customer examine where the project stands and plan on what changes should be made in the next iteration.

Deliverables

There are several deliverables during the Iteration SDLC. The requirements vary depending on what stage the project is in and are as follows:

Planning and Requirements Phase

The gathering and analysis of project requirements including defining technologies used, distributing the workload, and specifying a time frame and budget.

- Deliverables:
 - Software Requirement Specification document
 - Cost and time estimates
 - A low fidelity application wireframe

Analysis and Design Phase

Requirements gathered during the Planning and Requirements phase are amended with technical details.

- Deliverables:
 - System and database architectures (UML Diagrams)
 - Wireframes/mockups of application screens

Implementation Phase

Requirements are turned into code.

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- Deliverables:
 - Back-end code
 - Front-end code
 - Database schema

Testing Phase

The debugging process. Repeated until all critical issues are dealt with.

- Deliverables:
 - Unit testing results
 - Integration testing results

Deployment and Evaluation

The program is finalized and is ready for launch. Evaluation will continue after the initial program release.

- Deliverables:
 - Distribution of the application to the customer
 - Feedback gathered after the initial release
 - A plan for future updates and iterations

Implementation

Implementation of this application is straightforward and does not require any system downtime. The customer will be provided physical and online access to all of the necessary application files for installation. The systems administrator will be responsible for spinning up the database server, whether on-prem or hosted, and utilizing a provided script to build the necessary schema. The systems admin will work with a developer to establish the necessary database connections. Internal distribution of the application will be left to the discretion of the product owner and installation will be the responsibility of the customer's internal IT department.

Validation and Verification

Unit tests will be performed during the development process to ensure all parts of the application are running as intended. Upon distribution, the customer will provide acceptance testing and continued feedback for use in future iterations.

Environments and Costs

Programming Environment

- Windows 11 Home Edition
- SQL Server 8.0.29
- MySQL Workbench
- IntelliJ IDEA 2021.3.2 (Edu)

Environment Costs

There will be a \$500/year licensing fee which will cover upgrades to both the application and the database. If the customer decides to have the SQL server be hosted, a hosting provider can be arranged for approximately \$300 a year based on the customer's data requirements. No other support is required.

Human Resource Requirements

The time and costs for labor are divided as follows:

- Planning and Requirements: 20 hours
- Analysis and Design: 40 hours
- Development and Testing: 60 hours
- Deployment and Evaluation: 10 hours

Total billed time: 130 hours. Developers are the bulk of the HR costs at 70% with project managers at 20% and designers at 10%.

Project Timeline

Phase	Milestone/Task	Deliverable	Description	Dates
Planning and Requirements	Gather all application requirements.	Software Requirements Specification Document, cost estimate	Meet with customer, gather and organize all requirements.	6/3/2022 – 6/4/2022
Analysis and Design	Wireframes/Diagrams	Wireframe/Mockup, system and database architecture	Develop the UI and application flow.	6/6/2022 – 6/8/2022
Implementation	Turn the requirements and design into code.	The complete, viable product.	Code the application.	6/8/2022 – 6/23/2022
Testing	Develop Unit test, perform full operational check.	Testing results.	Test the application to ensure functionality.	6/23/2022 – 6/24/2022
Deployment	Provide the application to the product owner.	All needed application files.	Install the application on customer systems.	6/24/2022 – 6/25/2022

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