**C868 – Software Capstone Project Summary**

**Task 2 – Section A**



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| **Capstone Proposal Project Name:** | Concepcion Scheduling – Appointment Scheduler |
| **Student Name:** | Gabriel Concepcion |

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# **Business Problem**

**The Customer**

The customer is an international organization named GUC Corporation. GUC Corporation needs an appointment scheduling application with time-zone handling support. GUC Corporation is based in New York City, New York in the Eastern Standard Time zone. However, GUC Corporation has international employees who need to access the program from other time zones such as British Summer Time (GMT +1). GUC Corporation has 60 employees across different countries with an average of 15,000 customers a year. The employees and customers will benefit due to a modern dedicated scheduling application. An example would be less issues regarding overlapping appointments wasting both the employee and customer’s time. Employees will spend less time converting time-zones manually. Customers will be confident their appointments were scheduled properly. GUC Corporation’s short-term mission is to ensure international scheduling works smoothly no matter where the appointment scheduling is accessed. A long-term mission would be a scalable solution as GUC Corporation grows worldwide.

## **Business Case**

The Concepcion Scheduling software application addresses the need for a user-friendly desktop appointment scheduling system with international time-zone support. As is stands now, GUC Corporation frequently makes errors scheduling appointments within different time-zones. GUC Corporation can leave customers unsatisfied, leaving them unlikely to work with GUC Corporation again. Concepcion Scheduling software will solve this issue with proper time-zone handling and appointment alerts. The appointment alerts will include input validation for schedule conflicts and confirmation that the appointment takes place during business hours (in EST). The current system in place for GUC Corporation is not as efficient for database management as Concepcion Scheduling will be. Scalability will not be possible with GUC Corporation’s current solution where employees are manually converting time-zones with no input validation. A MySQL backend combined with a GUI-Based appointment scheduling program will address the concerns GUC Corporation has while being scalable for potential future growth.

## **Fulfillment**

Concepcion Scheduling will be a GUI-based standalone desktop application developed using Java. The UI will be designed to be user-friendly, containing intuitive forms with clear displays for customer, appointments, and reporting records. Input validation will be enforced to ensure data integrity. A login screen will be used to limit unauthorized access to the database.

After the login screen, a main menu will appear. The main menu will alert the logged-in user for any upcoming appointments. After the alert, three options appear. The three options will send you to the Appointments screen, Customer screen, and Reports screen.

The appointments screen will include functionality to schedule new appointments, view upcoming and past appointments, modify appointment details (time, date, participants, etc.), and delete appointments. Input validation will be used to stop potential issues such as overlapping appointments or appointments being set outside of business hours. The appointments will be available to view in a sortable table. Appointments will be editable in the same screen by entering details into the form below the table. The form will be enabled when the Add or Modify buttons are clicked.

The customers screen will have capabilities to add new customers, view existing customer details, update customer information (name, location, etc.) and include logic to ensure data integrity. The customers screen will work in tandem with the appointments data table to check if the customer has any upcoming associated appointments before allowing deletion. The customers will be available to view in a sortable table. Customers will be editable in the same screen by entering details into the form below the table. The form will be enabled when the Add or Modify buttons are clicked.

The reports screen will include tabs to generate reports such as contact schedule, number of appointments per country, and a table to view appointments by type and month. The last tab will contain a final text summary of appointments, customers, contact info, and the total number of these details. This can help visualize trends from potentially dense data in the future as GUC Corporation grows.

Concepcion Scheduling will use a MySQL database to store and retrieve customers and appointments. The database will be accessible through the GUI-based software solution, Concepcion Scheduling. Intuitive UI elements (buttons, text fields, forms) will allow any user to easily make necessary changes. All these elements will result in an accurate and user-friendly scheduling experience for GUC Corporation.

# **Existing Gaps**

Concepcion Scheduling has clear advantages over the prior scheduler GUC Corporation utilized. GUC Corporation is struggling with poor customer feedback. Customers have complained about overlapping appointments causing customers to appear for appointments even when a contact is unavailable. Customers have also booked appointments on weekends when GUC Corporation does not operate. These mistakes occurred from a lack of input validation allowing users to book appointments at whatever time slot is selected. This can happen easily when no time-zone conversion logic is implemented. Concepcion Scheduling solves each of these complications. With customers and contacts stationed internationally throughout the United States, United Kingdom, and Canada, a wide range of time-zones are used and must be translated to Eastern Standard Time.

The past scheduling solution also did not generate any reports. Business reports were created by hand, wasting valuable employee work hours that would be more productive elsewhere. Concepcion scheduling includes four reports that assemble the information GUC Corporation requests. Concepcion Scheduling will provide a centralized system where employees can generate reports while editing or viewing all required information regarding customers and appointments. Concepcion Scheduling will provide a modern solution to address past complications.

# **SDLC Methodology**

The Concepcion Scheduling project will utilize the Waterfall methodology. The Waterfall methodology is most suitable because GUC Corporation has provided specific project requirements. The requirements include a GUI-based standalone appointment scheduler application and database with CRUD capabilities for appointments and customers. GUC Corporation also requests a report generation feature and a secure login page.

The Requirements phase provides the scope and capabilities of Concepcion Scheduling. GUC Corporation provided a document with mandatory specifications. GUC Corporation’s specifications here include time-zone validation due to being an international company. Other screens and forms include a secure login screen, main menu, appointment, customer, and report screens.

The system design phase involves determining the development environment, which database technologies to use, which programming languages to use, and a wireframe or skeleton model of the project. An example of this would be a diagram of the model, view, controller, DAO, and FXML files all before any coding development is done. Class and design diagrams will be created. Designing test management and UI will be done in this phase.

The implementation phase is where the application is developed. Core application logic and functionality will be coded in Java while SQL is used for querying the MySQL database. Using the results of the requirements and system design phase, the application will be created to the correct standards.

The testing phase will contain a goal to document and test different modules, testing of the completed application, and ensure the documented specifications are met. Testing edge cases, common bugs, and potential security issues will be completed here. Bugs or errors will be corrected before proceeding to the next phase.

The deployment phase will prepare the application for delivery to GUC Corporation. The application will be fully usable for operations and all requirements will be met. The deliverable in this phase is the full functional application to GUC Corporation.

The maintenance phase will involve addressing any issues GUC Corporation brings to our attention. This could be bug fixes or potential improvements to Concepcion Scheduling. GUC Corporation’s feedback will always be addressed. Improvements will be considered if it matches the scope provided.

# **Deliverables**

The Waterfall methodology works well with clear specifications for each of the six phases. Deliverables will be split between project deliverables and product deliverables. The project deliverables are a part of the team’s responsibility, led by the project manager. The product deliverables will be provided to GUC Corporation.

## **Project Deliverables**

* Requirements Document
  + A comprehensive document describing all specifications to be met in Concepcion Scheduling. Examples include GUI requirements (user-friendly, time-zone conversions to local time, etc.), CRUD functionality for appointments and customers, report generation, and industry appropriate security features. Data validation will be required for all fields necessary. The requirements document will provide a clear understanding of details throughout the application regarding appointment scheduling (only allowed during business hours in EST) or any other feature implemented.
* Project Schedule
  + Timeline listing start dates and end dates for the Waterfall methodology phases (Requirements, System Design, Implementation, Testing, Deployment, Maintenance). Resource allocation and milestones will be listed.
* Low-Fidelity Wireframe
  + Barebones visual representation of the JavaFX screens. Created to show the GUI layouts for the login, main menu, customer, appointment, and reports screens.
* High-Fidelity Wireframe
  + Visual representation of the JavaFX screens. Created to show the final GUI layouts and flow for the login, main menu, customer, appointment, and reports screens.
* Database Schema
  + Diagram showing the structure of the MySQL database with table details, data types, and relationships.
* Test Plan
  + Document outlining testing strategies. Java method unit tests, integration tests, and system tests will be designed. Tests will have expected results to confirm if the functionality is implemented properly. User acceptance testing will be done as well.
* User Documentation
  + Comprehensive documentation will be provided for the end users. For example, a user manual will be created to inform users of the application’s setup, features, and usage.

## **Product Deliverables**

* Wireframes
  + Wireframes will be provided to GUC Corporation to ensure GUC Corporation is satisfied. Feedback will be considered.
* Database
  + MySQL database will be configured with a custom schema defined.
* Concepcion Scheduling Application
  + Standalone application that runs on all java-supported systems. Includes secure login management, CRUD functionality, report generation, time-zone conversions, and validation logic. Search field functionality and industry appropriate security features will be provided.
* User Documentation
  + Comprehensive documentation will be provided for the end users. For example, a user manual will be created to inform users of the application’s setup, features, and usage.

# **Implementation**

The implementation of Concepcion Scheduling into GUC Corporation’s production environment will be handled using this timeline out of business hours:

* Environment Setup
  + Setup for the MySQL database, necessary development, and testing environments. Ensure user desktops meet the requirements to run the Concepcion Scheduling java application.
* Database and Application Deployment
  + The Java application will be distributed to users and the database schema will be deployed. Initial data such as contacts or users will be populated.
* User Account creation
  + User account creation to replace “test” and “admin” accounts.
* Training / Support
  + Provide user documentation and host training sessions to lead managers and trainers. Multiple means of communication will be provided. A key pairing will be a communication connection with GUC Corporation’s IT team. This will increase the confidence levels of GUC Corporation’s employees. Validation and verification will be done at this stage.
* Live
  + The application is operational at the start of the new week on Monday at 8:00 am EST.

# **Validation and Verification**

A comprehensive testing plan will be created to validate and verify Concepcion Scheduling functions as expected and meets all specifications mentioned in the requirements documents. Testing findings and fixes will be documented in the validation and verification process.

Unit testing will be conducted during the development implementation and testing phases. Java methods will be tested to confirm functionality. This will be constructed while the code is being developed. Unit tests will allow small details to be tested such as if all appointment overlap conditions are met to display an appointment overlap alert.

Integration testing will be done by combining several modules and testing them to confirm the modules interact correctly between each other. An example would be checking if the JavaFX form populates data and interacts with the MySQL database properly.

System testing will test the full Java application. All features and functionality in Concepcion Scheduling will be verified again.

User Acceptance Testing will be done before the final deployment. GUC Corporation’s primary stakeholders will test Concepcion Scheduling to confirm their requirements were met in a user-friendly design.

# **Environments and Costs**

## **Programming Environment**

Concepcion Scheduling will utilize Java as a primary programming language. The user interface will be created using JavaFX and FXML. The database management will use MySQL and SQL queries to store customer, appointment, contact, and user data. The application will be developed in IntelliJ IDEA on Windows 10. It will be cross-platform with other desktop computers such as Linux or macOS because it is developed in Java.

## **Environment Costs**

Concepcion Scheduling will be a standalone application with relatively low environment cost. The highest expense will be hosting a MySQL database. Since GUC Corporation is an international organization, the database cannot be locally hosted. Cloud database services vary based on usage rates, but an estimate of $25.70 a month can be made considering GUC Corporation’s 15,000 users. As GUC Corporation expands, this estimate will raise.

## **Human Resource Requirements**

The project will require a full developer team. A lead project manager, a UX/UI designer, two software engineers, and a quality assurance specialist for two months. The project manager will keep the team focused on the deliverable timelines to ensure the project is completed on time. Project managers make $113,676 average annual salary in the United States. The project manager will make a pro-rated $18,946 for 2 months. The UX/UI designer will design the UI of Concepcion Scheduling. UX/UI designers make $93,287 average annual salary in the United States. The UX/UI designer will make a pro-rated $15,548 for 2 months. The two software engineers will create the functionality behind the application. Software Engineers make $147,524 average annual salary in the United States. The two software engineers will make a pro-rated $49,175 for 2 months of work. The quality assurance specialist will test the program to ensure the software engineers create robust systems. Quality assurance specialists make $71,279 median annual salary in the United States. The quality assurance specialist will make a pro-rated $11,880 in two months (ZipRecruiter).

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| **Resource** | **Average Annual Salary (US)** | **Pro-rated Project Cost (2 Months)** |
| 1 Lead Project Manager | $113,676 | $18,946 |
| 1 UX/UI Designer | $93,287 | $15,548 |
| 2 Software Engineers | $147,524 | $49,175 |
| 1 QA Specialist | $71,279 | $11,880 |
| **TOTAL Human Resource Cost** |  | **$95,599** |

# **Project Timeline**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Phase | Milestone/Task | Deliverable | Description | Dates |
| Requirements | Finalize project requirements and scope. Database schema design | Requirements document, DB initial schema | Project Manager meets with stakeholders to define specifications and design database structure. | 4/1/25 – 4/11/25 |
| Design and Environment | UI / FXML designs. Setup development environment. | Low-fidelity wireframe, UI mockups. Development environment. | UI/UX designer creat the UI that relates the look and feel of the project. Prepare development environments. | 4/14/25 – 4/25/25 |
| Implementation | Develop application features (customer and appointment management, reporting, time zone features, login) | Unit tests, application builds | Two software engineers begin development of the application features. Each feature added is tested with help from QA Specialist. | 4/28/25 –  5/16/25 |
| System Testing | Comprehensive system testing, security testing, and quality assurance validation. | System test plan, bug fixes, User Acceptance Testing | QA Specialist conducts full system testing with all modules interacting with each other. Vulnerabilities addressed. | 5/19/25 – 5/25/25 |
| Documentation | Finalize project documentation (user manuals) | User manuals and completed documentation | Write and complete documentation for users and staff. | 5/25/25 – 5/27/25 |
| Training /  Deployment | Prepare for deployment by training users with documentation and create accounts for users. Acceptance tests. | UAT sign-off, accounts created. Concepcion Scheduling will be deployment ready | Conduct User Acceptance Testing, get stakeholder approval, and prepare for application deployment. | 5/28/25 – 6/1/25 |
| Maintenance | Set up communication methods for maintaining Concepcion Scheduling. | Maintenance service agreement | Clear communication channels between GUC Corporation and the Concepcion Scheduling team. Support provided for critical bugs or in-scope feature requests or enhancements. | 6/2/25 – 6/2/26 |

# **Sources**

*Salary: Information Technology Project Management*. ZipRecruiter. (n.d.-a). https://www.ziprecruiter.com/Salaries/Information-Technology-Project-Management-Salary

*Salary: Quality Assurance Specialist (May, 2025) US*. ZipRecruiter. (n.d.-b). https://www.ziprecruiter.com/Salaries/Quality-Assurance-Specialist-Salary

*Salary: Software engineer (May, 2025) United States*. ZipRecruiter. (n.d.-c). https://www.ziprecruiter.com/Salaries/Software-Engineer-Salary