**C868 – Software Capstone Project Summary**

**Task 2 – Section C**

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| --- | --- |
| **Capstone Proposal Project Name:** | http://www.idevnews.com/views/images/uploads/general/wgu_logo.png  Global Appointments, Inc Tracking(GAIT) |
| **Student Name:** | Tresa A. Austin, MBA |

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Task 2 Part C – C868 Software Development Capstone

# Application Design and Testing

# Instructions for Testing and Evaluation:

1. Install the following NuGet packages:
   1. MySql.Data by Oracle
   2. MySql.Data.EntityFramework by Oracle
   3. MSTest.TestAdapter by Microsoft
   4. MSTest.TestFramework by Microsoft
2. To log into the program the username is **test** and the password is **test**.

# Design Document

## Class Design

The UML class diagram below shows the design for the GAIT application. There are three main classes agent, appointment, and customer. There is a one-to-one relationship with agents and appointments. Customers and appointments can have a none or many to one relationship. The agent class has four public methods. Register\_Load() enables an agent to create their credentials for the system and checks to make sure their username is unique. verifyUser() checks to ensure the agent has credentials to log in. getAgentID() is used to ensure that the next agentId assigned is incremental in the database. The methods called in the appointment and customer classes are similar to each other and depict creating, updating, and deleting appointments and customers as needed from the database and application.

Diagram

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## UI Design

When working with the management at Global Appointments, Inc it was decided that we would build a simple user interface that was robust enough to grow with the company. One of the areas where GA Inc management wanted to ensure future capabilities was in the reports section. In order to facilitate that, we made those separate dashboards within the user interface where other types of reports can easily be added to the dashboard.

Figure 1: Low Fidelity

Diagram

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Diagram

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# Unit Test Plan

## Introduction

### Purpose

Testing any application is an integral part of the process. To ensure that we cover all the bases, seven (7) unit tests were created as well as full functionality of components of the application. Testing completed ensures the client is getting a product that will meet their needs and be functional when delivered.

### Overview

Global Appointments Inc Tracker will be the sole repository of customer data and appointment data with ability to manage users of the application and run needed reports. Testing was centered around the goals of the client which are to have a customized, user friendly application. By having the five (5) GA Inc staff involved in testing, the goals remain clear throughout the entire testing process.

The test plan was broken into two parts, first unit testing was completed within Visual Basic on integral methods in the appointment and customer data sections. Secondly, a test plan of user actions was developed with negative and positive test cases to ensure that functionality was user friendly, and code was working.

## Test Plan

User Functionality testing done is outlined below with screen shots from the application.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test to Perform** | **Information** | **Negative Test #1** | **Results** | **Positive Test #1** | **Results2** |
| New User Registration | agent able to register using unique username | Insert "test" as username, which already exists | Message that username exists | Insert "test22" as username, which does not exist | Message that Registration was successful |
|  |  | Password less than 4 characters | Message that pwd must be at least 4 characters exists | Password of 4 characters | Message that Registration was successful |
|  |  |  |  |  |  |

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| --- | --- | --- | --- | --- | --- |
| **Test to Perform** | **Information** | **Negative Test #1** | **Results** | **Positive Test #1** | **Results2** |
| Login Functionality |  |  |  |  |  |
|  | agent able to login with created username and pwd | Use "test123" as username, which does not exist | Message User credentials were not correct, please select Reset button and try again | Use "Mcaper" as username, which does exist | User is directed to dashboard |
|  |  | Use "test123" as password, which does not exist | Message User credentials were not correct, please select Reset button and try again | Use "boss" as password, which does exist | User is directed to dashboard |

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| --- | --- | --- | --- | --- | --- |
| **Test to Perform** | **Information** | **Negative Test #1** | **Results** | **Positive Test #1** | **Results2** |
| Add Client | client is added with demographics values requried | Client name is missing from form | Message Please enter valid information for name | All information is filled out on form | Message Customer added successfully, would you like to add another? |
|  |  | Client address is missing from form | Message Please enter valid information for address |  |  |
|  |  | Client city is missing from form | Message Please enter valid information for city |  |  |
|  |  | Client state is missing from form | Message Please enter valid information for state |  |  |
|  |  | Client postal code is missing from form | Message Please enter valid information for postal code |  |  |
|  |  | Client country is missing from form | Message Please enter valid information for country |  |  |
|  |  | Client phone is missing from form | Message Please enter valid information for phone |  |  |
|  |  | Client email is missing from form | Message Please enter valid information for email |  |  |
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| --- | --- | --- | --- | --- | --- |
| **Test to Perform** | **Information** | **Negative Test #1** | **Results** | **Positive Test #1** | **Results2** |
| Update Client | client is updated with demographic values required | Blank value in client form | Message Please enter valid information | Client information is changed on form | Message Customer information has been updated |
|  |  |  |  |  |  |

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| --- | --- | --- | --- | --- | --- |
| **Test to Perform** | **Information** | **Negative Test #1** | **Results** | **Positive Test #1** | **Results2** |
| Deactivate Client | client is deactivated from customer list | No client selected from list but delete is pushed | Deactivate button is disabled until row is selected and agent chooses "yes" to Deactivate | Client is selected and verified to deactivate | Message Customer was deactivated |
|  |  |  |  |  |  |

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| --- | --- | --- | --- | --- | --- |
| **Test to Perform** | **Information** | **Negative Test #1** | **Results** | **Positive Test #1** | **Results2** |
| Add Appointment | client appointment is added with values required | Agent is not selected for appointment | Message Please enter valid information for Agent | Appointment fields are all selected | Message Appointment has been created, press ok to go back to the dashboard |
|  |  | Type is not selected for appointment | Message Please enter valid information for Type |  |  |
|  |  | Location is not selected for appointment | Message Please enter valid information for Location |  |  |
|  |  | Description is not selected for appointment | Message Please enter valid information for Description |  |  |
|  | client appointment is made between hours of 8am and 5pm | Appointment times start or end after 5pm | Message You have chosen an appointment outside of business hours. Please choose between 8am and 5pm |  |  |
|  | client appointment is made with appropriate times | Appointment start time is after end time | Message The appointment start time is after the end time |  |  |
|  |  | Appointment start and end times are on different dates | Message The appointment start and end date are on different dates |  |  |
|  |  | Appointment is made when there is already another appointment in that time slot | Message You have chosen an overlapping appointment time |  |  |
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| --- | --- | --- | --- | --- | --- |
| **Test to Perform** | **Information** | **Negative Test #1** | **Results** | **Positive Test #1** | **Results2** |
| Update Appointment | client appointment is updated with values required | Blank value in appointment form | Message Please enter valid information | Appointment Information is changed on form | Message Customer appointment has been modified |
|  | search agent information | Agent Id not in list | Message No agent with that Id is active | Agent Id in list | Highlighted row shows agent information |

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| --- | --- | --- | --- | --- | --- |
| **Test to Perform** | **Information** | **Negative Test #1** | **Results** | **Positive Test #1** | **Results2** |
| Deactivate Appointment | appointment is deactivated from appointment list | No appointment is selected from list but delete is pushed | Deactivate button is disabled until row is selected and agent chooses "yes" to Deactivate | Appointment is selected and verified to deactivate | Message appointment was deactivated |
|  |  |  |  |  |  |

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| --- | --- | --- | --- | --- | --- |
| **Test to Perform** | **Information** | **Negative Test #1** | **Results** | **Positive Test #1** | **Results2** |
| Deactivate Appointment | appointment is deactivated from appointment list | No appointment is selected from list but delete is pushed | Deactivate button is disabled until row is selected and agent chooses "yes" to Deactivate | Appointment is selected and verified to deactivate | Message appointment was deactivated |
|  |  |  |  |  |  |

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| --- | --- | --- | --- | --- | --- |
| **Test to Perform** | **Information** | **Negative Test #1** | **Results** | **Positive Test #1** | **Results2** |
| Appointment Reports |  |  |  |  |  |
|  | Appointment Sales | Start date is after end date | Message End date cannot be equal to or before start date, please select again | Valid date range is chosen | Information on sales for that time period are shown |
|  | Appointment By Week | Start date is after end date | Message End date cannot be equal to or before start date, please select again | Valid date range is chosen | Information on appointments for that time period are shown |
|  | Appointment Types | NA | NA | Appointments by type report is chosen | All appointment numbers by month are shown |
|  |  |  |  |  |  |

Graphical user interface

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|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test to Perform** | **Information** | **Negative Test #1** | **Results** | **Positive Test #1** | **Results2** |
| Customer Reports |  |  |  |  |  |
|  | Customer By State | NA | NA | Customer by state report is chosen | All customers are show with what state they are located in |
|  | Customer Email | NA | NA | Customer Email report is chosen | All customer emails are shown |
|  | New Customers | Start date is after end date | Message End date cannot be equal to or before start date, please select again | Valid date range is chosend | All new customers during that time are shown |
|  |  |  |  |  |  |

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| --- | --- | --- | --- | --- | --- |
| **Test to Perform** | **Information** | **Negative Test #1** | **Results** | **Positive Test #1** | **Results2** |
| Agent Information | agent is deactivated from list | No agent is selected from list but deactivate button is pushed | Deactivate button is disabled until row is selected and agent chooses "yes" to Deactivate | Agent is selected and verified to deactivate | Message agent was deactivated |
|  |  |  |  |  |  |

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Unit Testing

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### Items

Based on the above list, each task was performed by users and quality assurance to ensure functionality of the applications features listed below.

### Features

The functions of user registration, user login, adding/updating/deactivating clients, adding/updating/deactivating appointments, reporting functions and agent information were tested as part of the user functionality testing.

Unit testing included testing features of the CalendarObject method, the CustomerInfo method and converting dates/times to the user’s local time. In the CalendarObject, testing was done on if a date was between two dates or if a date was the same as the first date since appointments are tied to a large portion of the client’s business. In the CustomerInfo method tests for if the customer’s name already exists, if the customer’s name or address is left blank these are crucial parts of the customer demographics. Converting times is also integral to the client’s business since they have agents that work in various parts of the country.

### Deliverables

Testing documentation includes a spreadsheet of all tests with outcomes for user functionality testing, screen shots of that testing as well as unit test code within the solution.

### Tasks

In order to execute a fully vetted product, the following steps were taken for the user functionality testing as well as the unit testing.

User Functionality Testing

1. Create test cases to be tested.
2. List those test cases in an excel spreadsheet that can be shared via Teams.
3. Determine negative and positive outcomes.
4. Gather users to perform testing.
5. Have all users complete full test plan taking screen shots of teach outcome.
6. Complete bug tickets on any issues found, have those fixed and retest those issues.

Unit Testing

1. Install MsTest.TestAdapter and MsTest.TestFramework NuGet packages within the unit test solution.
2. Create code to test methods identified.
3. Run tests within Visual Studio.
4. Examine output to determine pass or failure.

### Needs

To perform the user functionality tests the following were needed:

1. A test plan created by PM and QA analysts.
2. Users to perform the test.
3. A location to perform the test with 7 computers available for 8 hours.
4. Lunch for the users testing the product.

To perform the unit tests the following were needed:

1. Creation of Unit Test Solution within Visual Studio.
2. Download of MsTest.TestAdapter and MsTest.TestFramework NuGet packages within that solution.
3. Software Developers to perform unit testing.

### Pass/Fail Criteria

For user functionality testing, there were no pass/fail criteria outlined within the test plan. Users were given parameters to test on both negative and positive test outcomes and were to record their results and take screen shots. Based on that feedback, any needed bug fixes were written up and then retested to ensure full functionality.

For the unit tests the criteria were based on the use case scenario. Either isTrue or isFalse was used based on the case scenario to assert the outcome.

## Specifications

Below are screenshots of the unit testing code. This code is located within the GI\_IncTests solution that is combined with the main application.

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## Procedures

A picture containing electronics, jack, gallery

Description automatically generatedAs mentioned above, there were two parts to the full test plan for this product. First, for the user functionality test a time was schedule at the Global Appointments, Inc office where ample room and computers were available for an 8-hour period. The room setup was completed the night before by the PM, a rendering of the setup is shown below:

Users accessed the test plan via Teams and downloaded their own copy for use during testing. Each user added notes on the outcomes and created a folder with screenshots. Once testing was completed all of the spreadsheets and screenshots were then added to the Teams channel and shared with PM, QA and software development staff. Any issues found were written up in Jira by QA and worked by the software development staff. Re-testing on failed issues was done by QA staff.

The unit testing was done in house by software developers, each developer wrote at least one unit test and all developers performed all unit testing on their local environment. Any issues were written up in Jira by the PM, fixes were put in place and retesting was done by software development.

## Results

Results for the user functionality tests are listed on the spreadsheet below:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test to Perform** | **Information** | **Negative Test #1** | **Results** | **Positive Test #1** | **Results2** |
| New User Registration | agent able to register using unique username | Insert "test" as username, which already exists | Message that username exists | Insert "test22" as username, which does not exist | Message that Registration was successful |
|  |  | Password less than 4 characters | Message that pwd must be at least 4 characters exists | Password of 4 characters | Message that Registration was successful |
|  |  |  |  |  |  |
| Login Functionality |  |  |  |  |  |
|  | agent able to login with created username and pwd | Use "test123" as username, which does not exist | Message User credentials were not correct, please select Reset button and try again | Use "Mcaper" as username, which does exist | User is directed to dashboard |
|  |  | Use "test123" as password, which does not exist | Message User credentials were not correct, please select Reset button and try again | Use "boss" as password, which does exist | User is directed to dashboard |
|  |  |  |  |  |  |
| Add Client | client is added with demographics values requried | Client name is missing from form | Message Please enter valid information for name | All information is filled out on form | Message Customer added successfully, would you like to add another? |
|  |  | Client address is missing from form | Message Please enter valid information for address |  |  |
|  |  | Client city is missing from form | Message Please enter valid information for city |  |  |
|  |  | Client state is missing from form | Message Please enter valid information for state |  |  |
|  |  | Client postal code is missing from form | Message Please enter valid information for postal code |  |  |
|  |  | Client country is missing from form | Message Please enter valid information for country |  |  |
|  |  | Client phone is missing from form | Message Please enter valid information for phone |  |  |
|  |  | Client email is missing from form | Message Please enter valid information for email |  |  |
|  |  |  |  |  |  |
| Update Client | client is updated with demographic values required | Blank value in client form | Message Please enter valid information | Client information is changed on form | Message Customer information has been updated |
|  |  |  |  |  |  |
| Deactivate Client | client is deactivate from customer list | No client selected from list but delete is pushed | Deactivate button is disabled until row is selected and agent chooses "yes" to Deactivate | Client is selected and verified to deactivate | Message Customer was deactivate |
|  |  |  |  |  |  |
| Add Appointment | client appointment is added with values required | Agent is not selected for appointment | Message Please enter valid information for Agent | Appointment fields are all selected | Message Appointment has been created, press ok to go back to the dashboard |
|  |  | Type is not selected for appointment | Message Please enter valid information for Type |  |  |
|  |  | Location is not selected for appointment | Message Please enter valid information for Location |  |  |
|  |  | Description is not selected for appointment | Message Please enter valid information for Description |  |  |
|  | client appointment is made between hours of 8am and 5pm | Appointment times start or end after 5pm | Message You have chosen an appointment outside of business hours. Please choose between 8am and 5pm |  |  |
|  | client appointment is made with appropriate times | Appointment start time is after end time | Message The appointment start time is after the end time |  |  |
|  |  | Appointment start and end times are on different dates | Message The appointment start and end date are on different dates |  |  |
|  |  | Appointment is made when there is already another appointment in that time slot | Message You have chosen an overlapping appointment time |  |  |
|  |  |  |  |  |  |
| Update Appointment | client appointment is updated with values required | Blank value in appointment form | Message Please enter valid information | Appointment Information is changed on form | Message Customer appointment has been modified |
|  | search agent information | Agent Id not in list | Message No agent with that Id is active | Agent Id in list | Highlighted row shows agent information |
|  |  |  |  |  |  |
| Deactivate Appointment | appointment is deactivated from appointment list | No appointment is selected from list but delete is pushed | Deactivate button is disabled until row is selected and agent chooses "yes" to Deactivate | Appointment is selected and verified to deactivate | Message appointment was deactivated |
|  |  |  |  |  |  |
| Appointment Reports |  |  |  |  |  |
|  | Appointment Sales | Start date is after end date | Message End date cannot be equal to or before start date, please select again | Valid date range is chosen | Information on sales for that time period are shown |
|  | Appointment By Week | Start date is after end date | Message End date cannot be equal to or before start date, please select again | Valid date range is chosen | Information on appointments for that time period are shown |
|  | Appointment Types | NA | NA | Appointments by type report is chosen | All appointment numbers by month are shown |
|  |  |  |  |  |  |
| Customer Reports |  |  |  |  |  |
|  | Customer By State | NA | NA | Customer by state report is chosen | All customers are show with what state they are located in |
|  | Customer Email | NA | NA | Customer Email report is chosen | All customer emails are shown |
|  | New Customers | Start date is after end date | Message End date cannot be equal to or before start date, please select again | Valid date range is chosend | All new customers during that time are shown |
|  |  |  |  |  |  |
| Agent Information | agent is deactivated from list | No agent is selected from list but deactivate button is pushed | Deactivate button is disabled until row is selected and agent chooses "yes" to Deactivate | Agent is selected and verified to deactivate | Message agent was deactivated |
|  |  |  |  |  |  |

The screenshot below is from Visual Studio’s Test Explorer. You can see by the top line that all tests have a green check mark which indicates they all passed. You can also see on the right side under Group Summary that there were 7 total tests and the outcome shows all 7 passed.

A picture containing text, screenshot, monitor

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# Source Code

All source code for Global Applications Inc Tracking (GAIT) is included with project submission. This is a standalone Windows application with a database connection, so internet connectivity is required for use of the application.