**Software Design Documentation**

**VaqPack**

Computer Science

Program of Study

VaqPack

Version 1.0

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**1. Introduction**

**1.1 Purpose**

The Software Design Document is a document to provide documentation which will be used to aid in the development of the VaqPack – Computer Science Program of Study application by providing the details for how the software should be built. This document provides a comprehensive architectural overview of the system, using several different architectural views to depict different aspects of the system. It is intended to capture and convey the significant architectural decisions that have been made on the system.

**1.2 Scope**

This program will be used as an information hub for incoming students of the Computer Science Program at UTRGV. Some of the key features of the system are the following. The software will enable the student (or user) to view the Computer Science Program of study, view its courses and a detailed description of each course. It will also enable the users to select an assortment of courses they are interested in and create and print reports from their selection. Lastly, the VaqPack program of study will allow the user to send e-mails with attachments, calculate their GPA, view faculty information, and view various other information about UTRGV and their Program of Study.

**1.3 Definitions, Acronyms, and Abbreviations**

The following terms, acronyms, and abbreviations are used throughout this document and are presented in the table below by order of appearance.

|  |  |
| --- | --- |
| **Term** | **Definition** |
| SDD | Software Design Description; A written description of a software product, that a software designer writes in order to give a software development team overall guidance to the architecture of the software project. |
| SRS | Software Requirement Specification; A comprehensive description of the intended purpose and environment for software under development. The SRS fully describes what the software will do and how it will be expected to perform. |
| VaqPack | VaqPack Computer Science Program of Study |
| GUI | Graphical User Interface; provides a visual, interactive means for a software user to manipulate the controls, commands, or features of that software. |
| IDE | Integrated Development Environment; software that provides tools for the development and organization of programming code. |
| JVM | Java Virtual Machine; Provides the necessary links allowing a java program to run on a machine using a particular operating system. |
| JRE | Java Runtime Environment; Including the Java Virtual Machine, all necessary components for a system to establish the environment in which Java programs will run. |
| DBA | Directs or performs all activities related to maintaining a successful database environment. |
| SQL | Structured Query Language; the standard relational database query language. |
| JDBC | Java Database Connectivity; a Java API developed by Oracle Corporation which provides methods for querying and updated a database. |
| XML | Extensible Markup Language; a markup language that defines a set of rules for encoding documents in a format which is both human-readable and machine-readable. |
| XSL | eXtensible Stylesheet Language; a style sheet language for XML documents. |
| HTML | HyperText Markup Language; the web standard language used in the delivery of online content, interpreted and rendered by web browsers. |
| PDF | Portable Document Format; a popular electronic document file type particularly used with rich-text or styled text. |

**2.** **References**

Git - <https://git-scm.com/>

GitHub - <https://github.com/>

HTML - <http://www.w3schools.com/html/>

Java Virtual Machine - <https://java.com/en/download/>

Java Runtime Environment - <http://www.oracle.com/technetwork/java/javase/downloads/jre8-downloads-2133155.html>

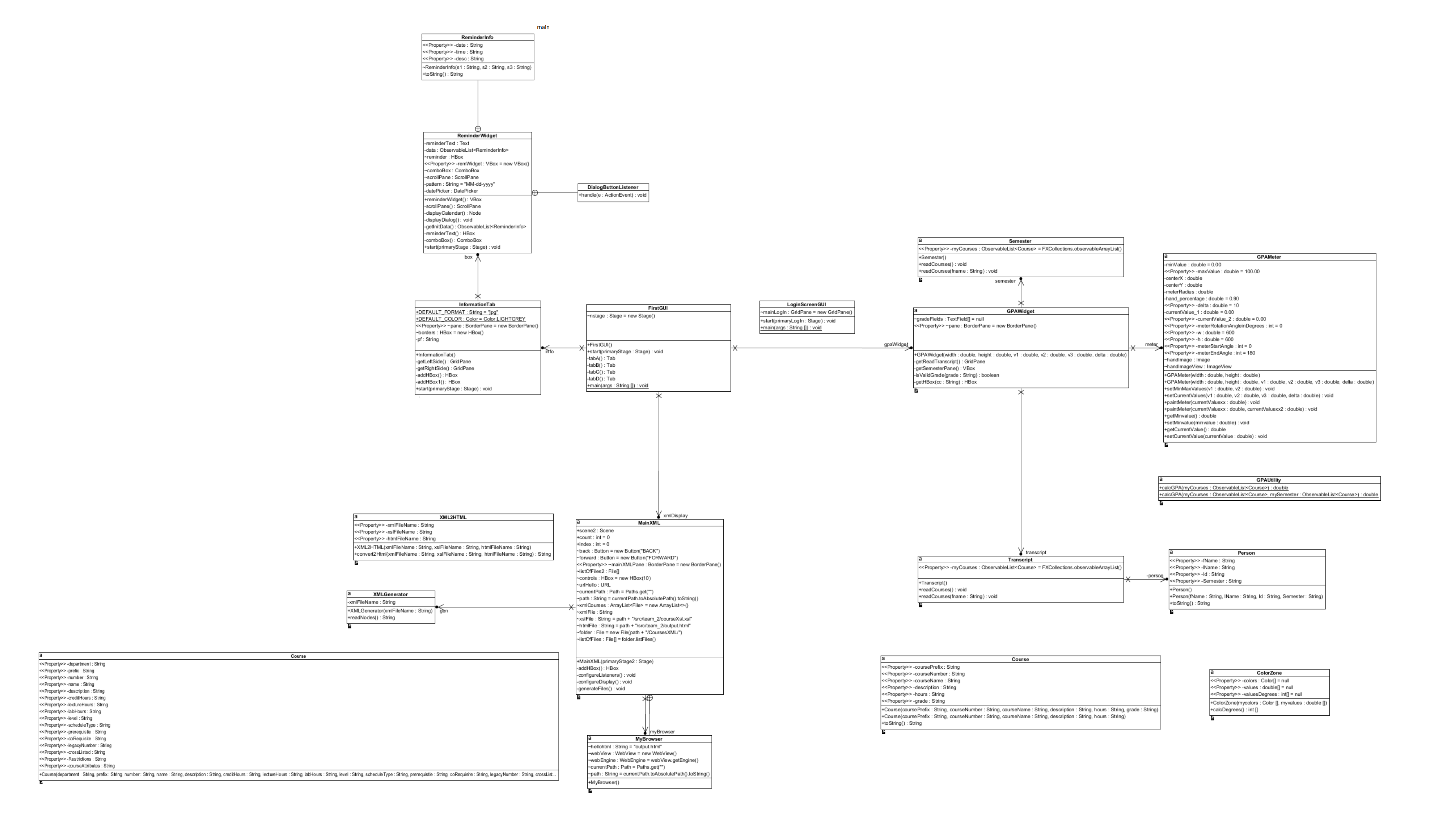
JavaFX - <http://docs.oracle.com/javase/8/javase-clienttechnologies.htm>

MySQL - <http://dev.mysql.com/downloads/mysql/>

NetBeans - <https://netbeans.org/>

**3.** **Detailed Design**

**3.1 Module Detailed Design**

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**3.1.01: MainGUI.java**

|  |  |
| --- | --- |
| **Class Name:** MainGUI | |
| **Brief description:** MainGUI class is responsible for displaying the tabs and main GUI artifacts | |
| **Attributes (fields)** | **Attribute Description** |
| GPAWidget gpaWidget | This is a declaration of a GPAWidget object used by the MainGUI class. |
| InformationTab info | This is a declaration of a InformationTab object used by the MainGUI class. |
| MainXML xmlDisplay | This is a declaration of a MainXML object used by the MainGUI class. |
|  |  |
| **Methods (operations)** | **Method Description** |
| tabA() | This method displays the first tab, which is the program of study |
| tabB() | This method displays the second tab which is the information tab |
| tabC() | This is a method which displays the gpawidget |
| tabD() | This is a method displays the report from the user and has the e-mail capabilities. |

**3.1.02: InformationTab.java**

|  |  |
| --- | --- |
| **Class Name:** InforamationTab | |
| **Brief description:** The Information Tab displays information about UTRGV | |
| **Attributes (fields)** | **Attribute Description** |
| BorderPane pane | This is a declaration of a borderpane to be used within this tab |
| ReminderWidget box | This a declaration of the ReminderWidget box that will be used in this tab |
| Hbox borders | This is a declaration of an HBox which will be used in this tab for the reminder widget. |
| StringProperty pf | This is a string declaration to be used for the drop down menu for the faculty |
| **Methods (operations)** | **Method Description** |
| InformationTab() | This is a default constructor method. |
| getLeftSide() | This is a gridpane method for the left side of the tab |
| getRightSide() | This is a gridpane method for the right side of the tab |
| addHBox() | This is an HBox method that visualizes the border at the top of the tab |
| addHBox1() | This is an HBox method that visualizes the border at the bottom of the tab |
| getPane() | This is a method which retrieves the borderpane |
| setPane() | This is a method that sets the borderpane |

**3.1.03: ReminderWidget.java**

|  |  |
| --- | --- |
| **Class Name:** ReminderWidget | |
| **Brief description:** This class displays the functioning reminder widget to be used in the information tab. | |
| **Attributes (fields)** | **Attribute Description** |
| Text reminderText; | This is a declaration of a Text class to be used throughout the class |
| ObservableList<reminderInfo> data | This observable list object observes the reminder widget for new reminders |
| HBox reminder | This is a declaration of an HBox object to be used throughout the class. |
| ComboBox comboBox | This is a declaration of a ComboBox object to be used in the popup menu when you add reminders. |
| ScrollPane scrollPane | This is a declaration of a ScrollPane object to be used for the reminder widget. |
| StringProperty pattern; | This is a string object that is used throughout the class. |
| DatePicker datePicker; | This is a declaration of a DatePicker object to select the date from the calendar. |
| Stringproperty date | This string object will be used throughout the class |
| Stringproperty time | This string object will be used throughout the class |
| Stringproperty desc | This string object is the description for the reminder to be used in the reminder widget box |
| **Methods (operations)** | **Method Description** |
| reminderWidget() | This is a method which creates a vbox to for the reminder widget. |
| scrollPane() | This is a method which holds the scrollpane where the reminders will be displayed |
| displayCalendar() | This is a method which displays the calendar for the reminder widget |
| getInitData() | This is a method which observes the reminder field for new reminders |
| comboBox() | This is a method which displays the list of time the user can select |
| getRemWidget() | This method retrieves the reminder widget |
| setRemWidget() | This method sets the reminder widget when called |
| reminderInfo(string, string, string) | This method sets the date, time, and description |

**3.1.04: Course.java**

|  |  |
| --- | --- |
| **Class Name:** Course | |
| **Brief description:** this class creates all the fields for the program of study course descriptions from the xml file | |
| **Attributes (fields)** | **Attribute Description** |
| stringproperty department | Declaration of a stringproperty object to be used throughout the class |
| stringproperty prefix | Declaration of a stringproperty object to be used throughout the class |
| Stringproperty number | Declaration of a stringproperty object to be used throughout the class |
| Stringproperty name | Declaration of a stringproperty object to be used throughout the class |
| Stringproperty description | Declaration of a stringproperty object to be used throughout the class |
| Stringproperty credithours | Declaration of a stringproperty object to be used throughout the class |
| Stringproperty lectureHourse | Declaration of a stringproperty object to be used throughout the class |
| Stringproperty labhours | Declaration of a stringproperty object to be used throughout the class |
| Stringproperty level | Declaration of a stringproperty object to be used throughout the class |
| Stringproperty scheduletype | Declaration of a stringproperty object to be used throughout the class |
| Stringproperty prerequisite | Declaration of a stringproperty object to be used throughout the class |
| Stringproperty coRequisite | Declaration of a stringproperty object to be used throughout the class |
| Stringproperty legacyNumber | Declaration of a stringproperty object to be used throughout the class |
| Stringproperty crossListed | Declaration of a stringproperty object to be used throughout the class |
| Stringproperty Restrictions | Declaration of a stringproperty object to be used throughout the class |
| Stringproperty courseAttributes | Declaration of a stringproperty object to be used throughout the class |
| **Methods (operations)** | **Method Description** |
| Course(string, string, string, string, string, string, string, string, string, string, string, string, string, string, string, string) | This is a constructor method which accepts String parameters for all the class fields. |

**3.1.05: MainXML.java**

|  |  |
| --- | --- |
| **Class Name:** MainXML | |
| **Brief description:** The main XML class contains he methods for generating the program of study from the html file. | |
| **Attributes (fields)** | **Attribute Description** |
| XMLGenerator gen; | This is a declaration of a XMLGenerator object used by MainXML class for generating the file to xml/xsl |
| Integer count | This is a variable used to move forward through the html view for the course descriptions |
| Integer index; | This is a variable used to keep track of the index that is being selected by the user. |
| Button back; | This is a declaration of a Button object used by MainXML class for going back through class descriptions |
| Button forward | This is a declaration of a Button object used by MainXML class for going forward through class descriptions |
| mainXMLPane | This is a declaration of a BorderPane object used by MainXML class for displaying the pane for the list of courses. |
| File[] listOfFiles2 | This is a declaration of a file[] array object to retrieve files from the database |
| HBox controls | This is a declaration of an HBox object used by MainXML to house the buttons |
| MyBrowser myBrowser | This is a declaration of a MyBrowser object used to display the courses within a webview |
| URL urlHello | This is a declaration of a URL object for the url for the filepath of the file. |
| Path currentPath | This is a declaration of a Path object used by MainXML to located path to the file object. |
| ArrayList<File> xmlCourses | This is a declaration of an arraylist to hold all of the courses from the xml file |
| Stringproperty xmlFile | This is a string property object to be used throughout the class |
| Stringproperty xslFile | This is a string property object to be used throughout the class |
| Stringproperty htmlFIle | This is a string property object to be used throughout the class |
| File folder | This is a declaration of a File object used by mainXML for the folder with the files. |
| **Methods (operations)** | **Method Description** |
| addHBox() | This is a method that houses the html view of the courses |
| configureListeners | This is a method that configures the listeners for the xml files |
| GenerateFiles() | This is a method that retrieves all the files from the xml folder. |
| configureDisplay() | This is a method that aligns all of the visualizations of the html, buttons and courses. |

**3.1.06: MyBrowser.java**

|  |  |
| --- | --- |
| **Class Name:** MyBrowser | |
| **Brief description:** The MyBrowser class is responsible for showing the courses in a webview in html | |
| **Attributes (fields)** | **Attribute Description** |
| Stringproperty hellothml; | This is a stringproperty object that outputs the output.html file |
| WebView webView | This is a declaration of the WebView object that will display the html file with the courses. |
| WebEngine webEngine | This is a declaration of the WebEngine object that drives the webview for displaying the html |
| Stringproperty path | This is a stringproperty object that displays the pathname of the file. |
|  |  |
| **Methods (operations)** | **Method Description** |
| MyBrowser() | This is a constructor method for MyBrowser() |

**3.1.07: XML2HTML.java**

|  |  |
| --- | --- |
| **Class Name:** XML2HTML | |
| **Brief description:** The XML2HTML class is responsible for converting the finished xml file to xsl and finally to HTML | |
| **Attributes (fields)** | **Attribute Description** |
| Stringproperty xmlFileName | This is a string property object for the xml file name |
| Stringproperty xslFileName | This is a string property object for the xsl file name |
| Stringproperty htmlFileName | This is a string property object for the html file name |
| **Methods (operations)** | **Method Description** |
| XML2HTML(string, string, string) | This is a constructor for XML2HTML that takes xmlfilename, xslfilename, htmlfilename as parameters |
| Convert2Html( File xmlFile, File xslFile, File htmlFile) | This is a static method which converts XML and XLS files to HTML via File object parameters. |

**3.1.08: XMLGenerator.java**

|  |  |
| --- | --- |
| **Class Name:** XMLGenerator | |
| **Brief description:** The XMLGenerator class is responsible | |
| **Attributes (fields)** | **Attribute Description** |
| Stringproperty xmlFileName | This is a stringproperty object that stores the file name of the xml file |
|  |  |
| **Methods (operations)** | **Method Description** |
| XMLGenerator(string) | This is a constructor for XMLGenerator that takes xmlFileName as a parameter. |

**3.2 Graphical User Interface Detailed Design**

This section presents the graphical user interface of the VaqPack Program of Study application that will have the form of a lightweight JavaFX based application, where all functionalities are grouped visually and logically into thematic units, according to the types of entities they are associated with, i.e. Program of Study, Information (UTRGV phone numbers, faculty information, setting reminders, calendar, etc), and Reporting. Special consideration was given to the application’s ergonomics, with the main concept being to provide visual grouping data group elements, with minimal effort required in terms of user actions. As a result, each of these elements is manifested as a separate tab, having its own contents and selected via an appropriate tab menu at the top of the main section of each page. Only one tab can be selected by the user at any one time. Where appropriate, each tab’s contents are further divided into sections, according to a particular logical and functional grouping. The sections that follow contain mock views of a selection of the most important aspects of the GUI, along with textual descriptions of their purpose and contents.

**3.2.01 Log-In Screen**

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| **Purpose** | The starting point of the VaqPack application is the login page that  contains the following elements:   * A Welcome window message. * A login area. * A first time registration area. |
| **Navigation & User Interaction** | To login the user is required to enter valid credentials or if it’s their first time using the application they will be required to register as a user. The successful login will advance the user to the first tab of the VaqPack application. |

**3.2.02 Program of Study**

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| **Purpose** | The first tab in the VaqPack application is a tab that contains the following elements:   * The program of study – computer science degree plan * Hot links for each class that open to a description of the course * A mechanism for selecting multiple courses |
| **Navigation & User Interaction** | The user can either view the course descriptions for the course they clicked on or they can select multiple courses which will give them the option to generate a report or add classes to their schedule. |

**3.2.03 Information**

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| --- | --- |
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|  | |
| **Purpose** |  |
| **Navigation & User Interaction** |  |

**3.2.04 Contact Information**

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| **Purpose** | The purpose of the information tab is to provide the student with information about the department of computer science, which includes phone numbers, email addresses of the two different campuses, a reminder widget to set reminders, and the ability to select the computer science instructors and see their information |
| **Navigation & User Interaction** | The user can navigate to the drop down menu and select a professor to see their information. They can also set a reminder by selecting a date on the calendar and then inputting the date, time and a description of the reminder which will be displayed in the reminder box. |

**3.2.05 Reporting**

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| **Purpose** | The purpose of this reporting tab is for the user to interact with the reports, as outlined by the following elements:   * Send an email with an attachment * Print reports * Calculate GPA |
| **Navigation & User Interaction** | Enter the email address and if needed an attachment to send the email. Enter classes and grades for those classes to calculate GPA and update the meter. Click the print button to print the report that was generated. |

**A.** **Appendices**

**A.1 Appendix 1**

Required form for the approval of changes to this SDD document:

**Document Approval**

The following Software Design Specification has been accepted and approved by the following:

|  |  |  |  |
| --- | --- | --- | --- |
| **Signature** | **Printed Name** | **Title** | **Date** |
|  | Deborah De Leon | Lead Software Engineer |  |
|  | Dr. M.K. Quweider | Instructor, CSCI-3340 |  |

**A.2 Appendix 2**

Required form must be attached to the end of this document if there are any changes after its initial completion:

# Revision History

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| --- | --- | --- | --- |
| **Date** | **Description** | **Author** | **Comments** |
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